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Dynamic risk, accounting-based valuation and firm fundamentals
M.R. Lyle · J.L. Callen · R.J. Elliott 899

Do sell-side analysts exhibit differential target price forecasting ability?
M.T. Bradshaw · L.D. Brown · K. Huang 930

Management forecast credibility and underreaction to news
J. Ng · I. Tuna · R. Verdi 956

A theory of voluntary disclosure and cost of capital
E. Cheyrel 987

Returns to buying earnings and book value: accounting for growth and risk
S. Penman · F. Reggiani 1021

Target's earnings quality and bidders' takeover decisions
K. Raman · L. Shivakumar · A. Tamayo 1050

Textual risk disclosures and investors' risk perceptions
T. Kravet · V. Muslu 1088

Optimal versus suboptimal choices of accounting expertise on audit committees and earnings quality
D. Bryan · M.H.C. Liu · S.L. Tiras · Z. Zhuang 1123

Stock option grant vesting terms: economic and financial reporting determinants
B.D. Cadman · T.O. Rusticus · J. Sunder 1159

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Abstract This study examines how takeover decisions are influenced by the quality of information in target firms' earnings. We show that bidders prefer negotiated takeovers in deals involving targets with poor earnings quality. Moreover, earnings quality and takeover premiums are negatively related in negotiated takeovers, suggesting that bidders obtain valuable private information through negotiations. We also find that bidders share information risk with target shareholders by paying with more equity for targets with poor earnings quality. These findings are driven primarily by the asymmetric information component of earnings quality (as opposed to the symmetric component) and are observed mainly in inter-industry takeovers, where asymmetric information concerns are greater, rather than in intra-industry takeovers. We conclude that targets' earnings quality affects bidders' takeover decisions, particularly in cases of large asymmetric information between targets and bidders.

Keywords Takeovers · Earnings quality · Asymmetric uncertainty · Negotiation · Bid premium · Stock payment

JEL Classification G34 · M41

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1 Introduction

Acquisition decisions rank among the most critical investment decisions made by firms. Before acquiring a company, bidders face important choices relating to the type of bid, the offer premium, and the method of payment. Such choices are likely to depend upon the quality of information available to bidders, as illustrated by the prevalence of anecdotal evidence where takeover bids are conditioned upon additional disclosures by the target.¹ In contrast to the copious anecdotal evidence, there is relatively little academic evidence on the role of targets' information quality in takeover decisions.² In this study, we address this issue by examining how the quality of targets' earnings, an important source of information in takeovers, affects bidders' takeover decisions.

Although information quality is likely to impact corporate decisions in general, takeovers provide an interesting context in which to study its effects on managerial decision-making, since a subset of the conditioning information, namely financial statements, is observable. Financial reports are by no means the only source of information used in takeover decisions, but they are likely to be an important source.³ The estimation of synergies and other benefits, for example, is often based on the financial information available about the target (see, e.g., Koller et al. 2005, pp. 436–443). The role of financial statements is likely to be even more important in deals where the target is either unwilling or unable to provide reliable inside information. Thus we focus on the quality of targets' financial reporting to capture the quality of information available in takeovers. More specifically, we examine how targets' earnings quality, as measured by the Dechow and Dichev (2002) and McNichols (2002) methods,⁴ affects acquirers' decisions along three key dimensions: (i) takeover method, (ii) offer premium, and (iii) payment method.

To develop our hypotheses, we follow Rogo (2009) and decompose a bidder's uncertainty arising from a target's earnings quality into two components: (i) *asymmetric uncertainty*, which reflects the informational advantage of target managers relative to other parties, including bidders, and (ii) *symmetric uncertainty*, which reflects the uncertainty faced equally by target managers and other parties. Asymmetric uncertainty, but not symmetric uncertainty, can be partly resolved

¹ For example, on January 4, 2006, BASF, one of the largest chemicals groups in the world, launched a hostile takeover bid for Engelhard Corp., a US specialty chemicals producer. Although the bid by BASF represented a 23 % premium over Engelhard's closing stock price, the CEO of BASF wrote in a letter to the CEO of Engelhard that BASF would be prepared to raise its bid "by as much as \$1 per share" if Engelhard was ready to open its books (Jenkins et al. 2006). For other examples, see also the bid by Murchison Metals Limited for Midwest Corporation Limited in 2007 and the bid by Electronic Arts Inc. for Take-Two Interactive Software Inc. in 2008.

² Contemporaneous papers examine the role of targets' earnings quality on bidders' announcement returns (McNichols and Stubben 2012) and on acquisition outcomes (Marquardt and Zur 2010).

³ Bushman and Smith (2001, p. 309) suggest that "a potentially important channel through which financial accounting information can enhance economic performance is by providing input to a variety of corporate control mechanisms."

⁴ Accrual-based metrics are widely used to measure financial reporting quality. See, for example, Aboody et al. (2005), Bharath et al. (2008), Cornett et al. (2008), Doyle et al. (2007), Francis et al. (2004, 2005), Hutton et al. (2009), and Lee and Masulis (2009).

through negotiations between the target and the bidder and is more likely to affect the takeover decisions that we study.

We hypothesize that, all else being equal, bidders prefer negotiated acquisitions when they face greater asymmetric uncertainty arising from a target's poor-quality reporting, as private negotiations reduce the information asymmetry between the bidder and the target and lower the bidder's information risks.⁵ Further, for such targets, we predict that the additional information obtained through negotiations is likely to lead to higher bid premiums, as negotiations unravel more private information in targets with poor reporting quality and takeover bids are more likely to occur when such information is positive. Lastly, we argue that bidders are more likely to offer shares (as opposed to cash) when asymmetric uncertainty is high, as the use of equity allows the acquirer to share the risk of overpayment with the target's shareholders or, in the case of underpayment, make the deal more acceptable for the target shareholders.⁶ In contrast to the above predictions, we predict either a weaker or a more ambiguous relation between bidders' takeover decisions and the symmetric uncertainty component of a target's earnings quality.

We test our predictions using a large sample of US takeovers of publicly listed firms over the 1977–2005 period. To isolate the roles of asymmetric and symmetric uncertainty components of earnings quality, we follow two alternative approaches. Under the first approach, we note that asymmetric uncertainty is more likely to be prevalent in inter-industry takeovers than in intra-industry takeovers and, therefore, assess the relative importance of asymmetric and symmetric components of uncertainty for bidders' decisions by comparing the empirical results across these takeovers. Under the second approach, we regress target earnings quality on either bid-ask spread (a proxy for asymmetric uncertainty) or analyst forecast dispersion (a proxy for symmetric uncertainty) and rely on the fitted values from the regressions to capture the components of earnings quality that give rise to asymmetric and symmetric uncertainty respectively.

Our empirical analyses reveal results consistent with the hypothesis that target firms' earnings quality affects bidders' takeover decisions. First, the likelihood of a non-negotiated bid is increasing in the quality of the target's earnings. Second, in negotiated transactions, we find a significant negative relation between targets' earnings quality and takeover premium, which is consistent with the notion that negotiations provide bidders with value-enhancing information. Finally, among public bidders, we find that the percentage of proceeds paid with equity is negatively related to the quality of the target's earnings. This effect is primarily observed in negotiated takeovers of relatively large targets (defined as targets whose market value is at least 15 % of that of the bidder), where the use of stock as payment method is a more meaningful tool to reduce over- or underpayment risks.

⁵ We denominate as non-negotiated takeovers those takeovers in which the bidder is unlikely to have access to the target's books of accounts and other inside information (e.g., bids rejected by target management and unsolicited bids). All other takeovers are classified as negotiated takeovers.

⁶ Moeller et al. (2007), and Officer et al. (2009) examine the effect of uncertainty on acquirers' stock returns. The stock price reactions to acquisition announcements capture investors' perceived valuation impacts of the totality of bidders' actions, while our study focuses on one of the determinants of those actions, namely financial reporting quality.

Our results occur in a subsample of inter-industry acquisitions, where both asymmetric uncertainty and symmetric uncertainty are likely to be present, but not in a subsample of intra-industry acquisitions, where symmetric uncertainty is the prime source of uncertainty. Further, when we parse our earnings-quality measure into symmetric and asymmetric components, we find that the results hold mainly for the asymmetric component. These findings are consistent with our prediction that asymmetric uncertainty arising from poor financial reporting quality is a main factor influencing bidders' decisions.

Our study makes several contributions to the literature. First, it adds to our understanding of how bidding firms adapt their takeover strategies to take into account asymmetric uncertainty and symmetric uncertainty arising from targets' financial reports. Second, although practitioners point to due-diligence activities as being one of the most important aspects of private takeover negotiations and spend significant amount of resources examining targets' books of accounts, scant academic evidence exists on how bidders' takeover strategies are influenced by such activities. Our results indicate that more information is garnered from private negotiations with poor earnings quality targets, pointing to a greater importance of due-diligence in such firms. Lastly, by examining how target firms' earnings quality influences investment decisions by bidders, our study adds to recent research that examines how financial reporting quality affects the cost and terms of corporate financing (e.g., Francis et al. 2005; Aboody et al. 2005; Bharath et al. 2008; Lee and Masulis 2009).

The rest of the paper is organized as follows. In the following section, we develop our hypotheses. Section 3 describes the research methods, including the measures of financial reporting quality and bid premiums used in the analyses. Section 4 describes the sample and presents descriptive statistics. The empirical results and robustness tests are presented in Sects. 5 and 6 respectively, and Sect. 7 concludes the paper.

2 Hypotheses development

2.1 Asymmetric uncertainty, symmetric uncertainty, and financial reporting quality

Following Rogo (2009), we decompose the uncertainty faced by a bidder on account of a target's poor financial reporting quality into two components: asymmetric uncertainty and symmetric uncertainty. Asymmetric uncertainty arises from the informational advantage that the target's management has relative to the bidder's, which can be (partly) resolved through private negotiations with the target.⁷ This type of uncertainty results from (i) limitations of the financial reporting system in capturing the underlying business fundamentals, (ii) managers' financial reporting

⁷ Prior studies evaluating the effect of financial reporting quality on information asymmetry between insiders and outsiders include Diamond (1985), Brown and Hillegeist (2007), and Bhattacharya et al. (2007).

choices, and/or (iii) the opacity caused by off-balance sheet transactions and real earnings management (e.g., R&D manipulation or selecting a specific transaction structure to achieve a reporting objective).⁸ While some elements of asymmetric uncertainty are within target managers' control, other aspects, such as the asymmetry caused by limitations in accounting standards, are clearly beyond their control.

In contrast, symmetric uncertainty is intrinsic to the business and is unlikely to be resolved through negotiations with the target. This component includes, for instance, uncertainty surrounding the macroeconomy, government regulation, and the success of research and development. Generally speaking, this component of uncertainty is not within the choice-set of the target manager.

Given these differences, we expect bidders' takeover decisions to be affected differently by the asymmetric and symmetric components of uncertainty resulting from a target's financial reporting quality. Next, we discuss how each of these components affects three major takeover decisions: (i) takeover method, (ii) bid premium, and (iii) method of payment.

2.2 Asymmetric uncertainty and takeover decisions

2.2.1 Takeover method: negotiated versus non-negotiated takeovers

The decision to make a hostile or friendly takeover is a strategic decision on the part of the companies involved (Schwert 2000). A bidder can take control of a target firm either by initially negotiating with the target's board and management or by making a hostile tender offer directly to shareholders. We define the former strategy as a negotiated takeover and the latter as a non-negotiated takeover.⁹

As part of the negotiations, the target's management is likely to allow bidders access to its underlying books of accounts (including management accounts) and other inside information, thereby revealing its private information and reducing asymmetric uncertainty. We propose that bidders are likely to prefer negotiated takeovers over non-negotiated ones when the asymmetric component of financial reporting quality is high, as in these cases the benefits from negotiating with the target's management are likely to outweigh the potential costs of negotiation.¹⁰

Previous studies have shown that poor financial reporting quality increases the likelihood of misvaluation (e.g., Aboody et al. 2005). In our setting, this implies a higher risk of overpayment, given that target managers are more likely to reject offers that undervalue their firms. The difficulty in valuing targets with poor financial reporting quality also increases the range of bids made by competing

⁸ Managers could obscure their financial reporting to veil their perk consumption and mislead investors, or to avoid disclosing proprietary information. Thus, the decision to issue opaque financial statements is not necessarily inconsistent with shareholders' value maximization.

⁹ We do not require negotiated takeovers to involve only one bidder. In this sense, our definition of negotiated takeovers is different from that employed by Boone and Mulherin (2007), who classify firms based on whether they were auctioned among multiple bidders or negotiated with a single bidder.

¹⁰ A potential cost of a negotiated takeover is the lower expected offer price compared with a public auction (see Rogo 2009).

bidders, leading to larger losses for the winning bidder (see Roll 1986; Varaiya 1988; Bazerman and Samuelson 1983).¹¹ To mitigate losses from overpayment and increase their chances of success, bidders are more likely to negotiate takeovers involving targets with poor financial reporting quality, with the view of garnering information that decreases asymmetric uncertainty.¹²

Another reason for preferring negotiated takeovers relates to the potential release of private information to unwanted bidders, competitors and capital market participants that may occur in public tender offers (Berkovitch and Khanna 1991). This risk is more pronounced when the target has poorer financial reporting quality (given the greater information asymmetry in the capital market), making a negotiated takeover more attractive in such cases. Since this information spillover risk exists irrespective of whether the bid is initiated by the target or by the bidder, both parties would prefer a negotiated takeover when opaque financial reports cause greater asymmetric uncertainty (see also Rogo 2009). Conversely, when the target's financial reporting quality is good, there are fewer benefits from negotiating, increasing the likelihood of a direct tender offer to shareholders.

All these arguments lead to our first hypothesis:

H1 The likelihood of a non-negotiated takeover decreases with the asymmetric uncertainty component of a target's financial reporting quality.

2.2.2 Takeover premium

As discussed above, bidders can mitigate the asymmetric uncertainty component of poor financial reporting quality through negotiations. In the case of *announced* takeovers (i.e., takeover bids that become known to the public), the information revealed to the bidder in such negotiations is likely to be value-enhancing. This is because negotiated bids are less likely to occur when the target management's private information is negative; in such cases, either the target management would be less willing to negotiate and share information, or bidders would walk away from the negotiations without making a formal bid.¹³ The information gleaned from private negotiations is likely to be even more value-enhancing when asymmetric information is high, given the greater potential for release of private information in such cases. Thus we propose that this "favorable selection" argument, combined

¹¹ Surveys by Thaler (1988), Barberis and Thaler (2006), and Baker et al. (2006) conclude that the winner's curse holds in corporate takeover auctions. Boone and Mulherin (2008) fail to find evidence for the winner's curse in the private auction process that precedes the announcement of some takeover deals that are initiated by the target.

¹² Milgrom and Weber (1982) and Eso and Szentes (2007), among others, discuss targets' incentives to disclose information in order to refine bidders' valuations.

¹³ Holmes and Schmitz (1995) make a similar point in the context of small businesses and note that businesses that are sold are likely to be of a higher quality than those that are not sold.

with competition in the market for corporate control, results in higher premiums being offered in negotiated takeovers of targets with greater asymmetric uncertainty in their financial reports.¹⁴

This prediction raises a particularly poignant possibility: *ceteris paribus*, takeovers of targets with more asymmetric uncertainty in their financial reports obtain larger premiums due to greater value creation, which raises the point: “What is the source of value creation?”

One source of value creation is the better use of information-based assets (e.g., R&D, brands), which tend to make a target’s financial reports less transparent and more prone to asymmetric uncertainty. A merger could allow the bidder and target to extract full synergistic value from such assets, which may not be possible under arms’ length deals, owing to difficulties in transmitting tacit information (see also Conn et al. 2005).

Another source of value creation is through the elimination of valuation discounts suffered by targets with poor financial reporting quality. Prior studies suggest that these valuation discounts are a compensation to investors for the greater information-related risks and agency problems borne by such firms (e.g., Easley et al. 2002; Easley and O’Hara 2004; Lambert et al. 2007; Francis et al. 2004, 2005; Damodaran 2006; Urcan et al. 2008). By reducing the reliance on financial statements, a bidder, particularly one facing relatively low agency problems, could mitigate the causes underlying the valuation discounts of targets with higher asymmetric uncertainty in their financial reports.¹⁵

In contrast to the above discussion on negotiated takeovers, we expect asymmetric uncertainty arising from a target’s financial reports to be unrelated to the bid premium in *non-negotiated* takeovers, as the uncertainty and information risk remain unresolved. The bidder continues to face the same risks as other capital market participants, warranting neither an additional valuation discount nor a premium (since the target’s stock price already reflects the potential risks associated with the target’s reporting quality).

Thus our second hypothesis is:

H2 The bid premium in negotiated (non-negotiated) takeovers is positively related (unrelated) to the asymmetric uncertainty component of a target’s financial reporting quality.

¹⁴ It is worth noting that, in line with the corporate finance literature, both our hypotheses and empirical tests are conditional on an event (namely, an acquisition announcement) occurring. Prabhala (1997) shows that controlling for potential selection bias in conditional event studies offers little value relative to traditional event study methodologies, particularly when firms choosing not to participate in the event are unobservable.

¹⁵ Even though, after an acquisition, a bidder could take actions that have a negative impact on the target’s value, competition in the market for corporate control would force the bid premium to be based on the gains achievable from eliminating a target’s valuation discount.

2.2.3 Method of payment

Since misvaluation risk is larger in takeovers involving greater asymmetric uncertainty in financial reports, we would expect both bidders and targets to take actions that minimize losses from misvaluations.

One way to mitigate losses from misvaluation is to use stock as a method of payment, as a stock offer is essentially a contingent pricing contract that allows targets' shareholders to share in both gains and losses of the combined entity. Hansen (1987), for example, argues that acquirers could protect themselves from overpaying for a target by using stock as method of payment, as any ex post losses occurring from overpayment cause the combined entity's stock price to go down, resulting in the losses being shared between the target and bidder shareholders.¹⁶ A stock offer could also entice a target's manager to accept a takeover offer even if the bid price undervalued the target on the acquisition date, since the stock offer partly compensates target shareholders for any initial underpayment by allowing them to share in the stock-price gains of the combined entity (Fishman 1989).

The use of stock as a method of payment will be particularly attractive when a bidder makes a non-negotiated takeover attempt for a target with poor financial reporting quality, as asymmetric uncertainty concerns are greatest in this case. However, it may also be attractive in negotiated takeovers of targets with poor financial reporting quality, as negotiations may not fully resolve the information asymmetry between target and bidder, owing to difficulties in credibly communicating soft information and hold-up problems in negotiations.

These arguments lead to our third hypothesis:

H3 The use of stock as a method of payment is positively associated with the asymmetric uncertainty component of a target's financial reporting quality. This relation is expected to be stronger for non-negotiated takeovers than for negotiated takeovers.

2.3 Symmetric uncertainty and takeover decisions

In contrast to the effect of asymmetric uncertainty on bidders' decisions, the influence of symmetric uncertainty is either unclear or, at best, weaker.

Since symmetric uncertainty cannot be resolved through negotiations with a target's management, bidders would have little preference for negotiated takeovers when faced with high symmetric uncertainty. However, bidders may still engage into negotiations in such cases, in order to avoid information spillovers. Hence, we expect the relation between takeover method and symmetric uncertainty arising from a target's financial reports to be negative but weaker than in the case of asymmetric uncertainty.

¹⁶ The ability to share losses from overpayment with target shareholders implicitly assumes that target shareholders, especially those with private information about potential overpayment, do not sell their share-holdings in the merged firm soon after the merger. This assumption is consistent with SEC Rule 145, which lays restrictions on certain key target shareholders from reselling their shares immediately after a merger. In practice, additional restrictions are often placed through contractual arrangements between the merger parties.

With regard to bid premium, prior studies provide mixed predictions for the effect of symmetric uncertainty. On the one hand, bidders are likely to offer lower premiums for targets with larger symmetric uncertainty, in order to lower potential losses from the winner's curse (Milgrom and Weber 1982). Moreover, Epstein and Schneider (2008) note that ambiguity-averse investors will discount the price of low-information-quality stocks when the fundamentals of their assets are volatile, which also predicts a negative relation between symmetric uncertainty and bid premium. On the other hand, Pastor and Veronesi (2003, 2006) analytically show that, in a world with low risk-aversion, firm value increases with uncertainty about a firm's future profitability.¹⁷ In our context, this model implies higher bid premiums for targets with larger symmetric uncertainty, particularly with regard to uncertainty about future synergies. In sum, theory predicts both a positive and a negative relation between symmetric uncertainty and bid premium, depending on the risk-aversion profile of bidders.

Finally, with regard to the method of payment, Berkovitch and Narayanan (1990), Fishman (1989), and Eckbo et al. (1990) note that, in markets with symmetrically informed agents, the medium of exchange in a takeover is economically irrelevant, because the level of the merger-induced gains, as well as the division of these gains across bidder and target, does not depend on the method of payment.¹⁸ Thus, when financial reporting quality reflects symmetric uncertainty, we do not expect any relation between this component of reporting quality and the method of payment.

Finally, the effect of symmetric uncertainty on bid premium and method of payment is unlikely to vary across negotiated and non-negotiated takeovers, given that negotiations do not mitigate this type of uncertainty.

Based on these arguments, we formally state the effect of symmetric uncertainty on bidders' takeover decisions as follows:

H1A The likelihood of a non-negotiated takeover decreases with/is independent of the symmetric uncertainty component of a target's financial reporting quality.

H2A The bid premiums in both negotiated and non-negotiated takeovers are ambiguously related to the symmetric uncertainty component of a target's financial reporting quality.

H3A The use of stock as a method of payment in both negotiated and non-negotiated takeovers is unrelated to the symmetric uncertainty component of a target's financial reporting quality.

¹⁷ The intuition in the models of Pastor and Veronesi (2003, 2006) is that greater uncertainty about average profitability increases the likelihood that the future growth rate of book equity will be persistently high or low. Because of the convex relation between future firm value and compounded growth rates, the positive effect of a high growth rate on the expected future firm value will be disproportionately larger than the corresponding effect of a low growth rate. As a consequence, firm value is higher as the uncertainty about average profitability increases.

¹⁸ Under symmetric information, the target will accept any offer that equals or exceeds its expected payoff from rejection. Therefore the equilibrium offer in this scenario is simply equal to the present value of the target's expected payoff from rejection.

3 Research method

3.1 Earnings quality measure

In line with recent studies (e.g., Aboody et al. 2005; Francis et al. 2004, 2005; Lee and Masulis 2009), we measure earnings quality as the mapping of accruals into cash flows: the weaker the mapping, the poorer the quality of information in earnings. Francis et al. (2008) show this measure to be a good proxy for overall reporting quality. In particular, for each year t and each of Fama and French's (1997) 48 industry groups, we estimate the following equation:¹⁹

$$ACC_{i,t} = \alpha_0 + \alpha_1 CFO_{i,t} + \alpha_2 CFO_{i,t-1} + \alpha_3 CFO_{i,t+1} + \alpha_4 \Delta REV_{i,t} + \alpha_5 GPPE_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where $ACC_{i,t}$ is firm i 's accruals (net income – cash flow from operations) in year t , and $CFO_{i,t}$ is firm i 's cash from operations in year t .²⁰ Following McNichols (2002), we include $\Delta REV_{i,t}$ the change in total revenue (Compustat #12), and $GPPE_{i,t}$, the gross property, plant, and equipment (Compustat #7), as control variables. All the variables are standardized by average total assets (Compustat #6), and winsorized, at the 1st and 99th percentiles each year.

The annual cross-sectional estimations of Eq. (1) yield firm- and year-specific residuals. Earnings quality (EQ) for firm i in year t is then computed as the standard deviation of firm i 's residuals over years $t - 5$ through $t - 1$, where a higher value indicates lower earnings quality. In our empirical tests, year t corresponds to the fiscal year ending at least 3 months prior to the acquisition announcement. We lag the period over which the standard deviation of residuals is computed by 1 year, relative to year t , to account for the fact that Eq. (1) includes the year-ahead cash flows.²¹

This approach to measuring earnings quality is likely to bias our sample towards larger and more successful targets. To minimize this bias, we require firms to have a minimum of only three observations to compute the standard deviation of the residuals, although our results are not sensitive to this requirement.

Finally, to ease the interpretation of our results, we take the negative value of the standard deviation of the residuals as our estimate of earnings quality, so that a higher value for this estimate corresponds to higher earnings quality.

¹⁹ We require at least 20 firms in year t to estimate the industry-level regressions.

²⁰ CFO is taken directly from the cash flow statement (Compustat #308) when available. Otherwise it is computed from balance-sheet changes as: Net income (Compustat #18) – {Change in current assets (Compustat #4) – Change in cash and short-term investment (Compustat #1) – [Change in current liabilities (Compustat #5) – Change in debt in current liabilities (Compustat #34) – Change in income taxes payable (Compustat #71)] – Depreciation and amortization (Compustat #14)}. To be consistent with the definition of cash flows, accruals are based on net income from cash flow statements (Compustat #123) when cash flows are obtained from the cash flow statement. Otherwise, net income is obtained from the income statement (Compustat #18).

²¹ Lagging the earnings quality proxy by a year relative to the acquisition announcement also allays concerns that our measures of reporting quality may be influenced by the target's management manipulating earnings in the year prior to a takeover.

3.2 Measuring the symmetric and asymmetric uncertainty components of financial reporting quality

Conceptually, the key difference between the asymmetric and symmetric uncertainty components of financial reporting is whether a target manager has private information about the underlying drivers of financial reporting quality. Capturing this difference is, of course, challenging. In the next two subsections, we describe the two approaches followed in this paper.

3.2.1 *Inter-industry versus intra-industry takeovers*

In our first approach, we split our sample of takeovers into two groups, based on whether the acquirer and target are in the same industry (*intra-industry* takeover) or in different industries (*inter-industry* takeover).

Firms in the same industry frequently share information through industry-association conferences, senior-management forums and networking events, CEO-level meetings, etc., and hence are likely to be well informed of the happenings in each other's firms. Moreover, through their own economic activities, confidential industry reports, and close tracking of competition, firms often have a clearer idea of the economic performance, key risks, and economic drivers of their industry peers. In contrast, firms tend to have less access to detailed information about industries other than their own.

Based on these observations, we propose that bidders engaged in intra-industry takeovers have a better understanding of the sources of uncertainty underlying a target's financial reporting quality and, hence, are likely to face less *asymmetric uncertainty* than bidders engaged in inter-industry takeovers. *Symmetric uncertainty*, however, is likely to be present in both intra- and inter-industry takeovers, since, by definition, symmetric uncertainty is largely unaffected through sharing of information across firms.

In sum, whereas inter-industry takeovers are characterized by both asymmetric and symmetric uncertainties, intra-industry takeovers are characterized primarily by symmetric uncertainty. Thus, if the bidders' takeover decisions that we consider are driven primarily by the asymmetric uncertainty component of financial reporting quality, we should observe supporting results mainly in the *inter-industry* subsample. On the other hand, if the two components of financial reporting quality are equally important, then we should observe similar results across the *inter-industry* and *intra-industry* sub-samples.

3.2.2 *Predicted components of earnings quality*

The use of inter-industry and intra-industry analyses to capture asymmetric and symmetric uncertainties admittedly has limitations. Hence we alternatively use a regression-based approach to identify the asymmetric and symmetric components. In particular, we regress our earnings quality proxy (*EQ*) on proxies for either (i) information asymmetry or (ii) symmetric uncertainty. Then we use the predicted

values from each of these regressions to evaluate the effect of each EQ component on bidders' takeover decisions.

In our first regression model, our proxy for information asymmetry is the bid–ask spread, which has been shown to capture information asymmetry between informed and uninformed traders in capital markets (Glosten and Milgrom 1985; Venkatesh and Chiang 1986). Although our study focuses on information asymmetry between bidder and target management, the bid–ask spread is likely to be related to the informational advantages of the target management, insofar as these informational advantages lead capital market participants to view target management as potential informed traders. Thus the fitted value of this regression is our proxy for the asymmetric uncertainty component of EQ .

In our second regression model, we use analysts' forecast dispersion to capture symmetric uncertainty, as prior studies have shown that analysts' forecast dispersion is positively correlated with general measures of uncertainty (e.g., Lang and Lundholm 1996). In this model, the fitted value is our proxy for the symmetric uncertainty component of EQ .²²

3.3 Bid premium measure

Previous studies have measured the takeover premium using either the bid values provided by the Securities Data Corporation database (SDC) or the targets' stock returns. We employ both of these measures in our analyses, after adjusting them for market returns, given that a target's earnings quality has no influence on the premium attributable to market-wide shocks.

Our first measure of bid premium, *SDC premium*, is the cumulative abnormal return over event day -63 to event day 0 , where event day 0 is the announcement date.²³ This measure captures both the premium offered at the takeover announcement and the additional cost faced by the bidder on account of a pre-bid run-up that occurs because of either insider trading or leakage of the bid news (see Meulbroek 1992).

Officer (2003) notes that the data on bid values provided in SDC critically depend on the method and assumptions used to estimate bid values in takeovers involving non-cash offers. Hence, following Schwert (1996), we use a second measure of premium, *Schwert premium*, which is based on the target's cumulative abnormal return around the acquisition announcement (-63 to $+126$ days event window). The inclusion of returns in the post-announcement period allows for changes in the price offered to the target shareholders.

²² Since bid–ask spreads and analyst forecast dispersion are noisy proxies, they will be insufficient to comprehensively capture aspects of information asymmetry between bidders and targets or of symmetric uncertainty. This makes it difficult to interpret residual components cleanly from regressions of EQ on these proxies as reflecting either asymmetric or symmetric uncertainty. Hence we do not consider the residual components in our subsequent analyses.

²³ The returns for event day 0 are computed using the SDC reported offer price and the closing stock price on day -1 , while the abnormal returns are computed from a market model whose parameters are estimated over event days -316 to -64 (See the appendix for further details).

Some firms in our sample have large, negative premium measures. As Officer (2003) describes, the interpretation of negative premiums is problematic. Hence we follow his approach and delete observations with premiums in excess of 200 % or less than 0 %. In untabulated analyses, we find that our results are robust to allowing for negative premiums as well as to including all observations with positive premiums.

4 Sample and descriptive statistics

We obtain our sample of takeover bids from the SDC database. We restrict our sample to US publicly listed target companies and transactions where the bidder seeks to own more than 50 % of the target after the transaction is completed (as in, for example, Moeller et al. 2007; Officer et al. 2009). Our final sample consists of 4,716 takeover bids, of which about 84 % involve inter-industry takeovers (see Panel A of Table 1).

The takeovers in our sample are spread across a variety of industries, with the business equipment industry accounting for the highest frequency of takeovers (17.6 % of the sample) (Panel B of Table 1). Consistent with the overall pattern of takeover activity reported in the literature (see, e.g., Holmstrom and Kaplan 2001), many takeover events occurred in the mid-1980s and the mid-1990s, although none of the years by itself accounts for more than 7 % of the full sample (Panel C of Table 1).

Table 2 presents descriptive statistics on the variables used in the study, together with differences in the means across two groups obtained by sorting the sample either by industry similarity (inter-industry versus intra-industry) or by takeover method (negotiated versus non-negotiated). A takeover is classified as an intra-industry takeover if bidder and target belong to the same industry, based on Fama–French 12 industry classification;²⁴ otherwise it is classified as inter-industry takeover. We refer to takeover bids as non-negotiated if SDC classifies the bid as either hostile or unsolicited.²⁵ Accordingly, negotiated takeovers are those where the target is likely to allow access to its underlying books of accounts, irrespective of whether the takeover is target-initiated or involves multiple bidders.

The deal characteristics of our sample firms are generally consistent with those reported in prior studies (e.g., Officer 2003; Schwert 2000). Takeover bids are predominantly negotiated, with only 10.8 % of the offers being classified as non-negotiated. Cash is used as the mode of payment in 44.7 % of the takeover bids, and 12.8 % of the sample involves equity as the sole method of payment. Multiple bidders (“auctions”) are involved in 11.4 % of the takeovers. Finally, the average *SDC premium* for our sample is 52.9 %, and the average *Schwert premium* is 48.0 %. The average bid premiums are significantly greater for intra-industry takeovers than for inter-industry takeovers; however, the differences across negotiated and non-negotiated bids are not significant.

²⁴ Fama–French 12-industry classification is derived from reclassifying four-digit SIC codes and is available at Kenneth French’s website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html.

²⁵ According to SDC, a transaction is defined as hostile if the target board officially rejects the offer but the acquirer persists with the takeover. Similarly, a transaction is defined as unsolicited if the offer is a surprise to the target’s board, and it has not yet given a recommendation.

Focusing on the characteristics of the target firm, the average (median) market capitalization is \$540 (\$77) million. The average target firm has a negative return on equity, sales growth of 9.5 % per year, and a leverage ratio of 61.4 %. The average value of EQ for the sample firms is -0.058 , which is similar to the average for Compustat firms as a whole. We observe significant differences across subsamples. For instance, targets involved in inter-industry takeovers have, on average, lower sales growth and lower market-to-book ratios but higher EQ than those involved in intra-industry takeovers. Targets involved in non-negotiated bids also have higher

Table 1 Sample composition

	Number of observations	
<i>Panel A: Sample construction</i>		
Total number of firm-years from SDC	21,453	
Less: firm-years with missing target earnings-quality data	13,798	
Less: firm-years with (other) missing target Compustat data	600	
Total number of firm-years	7,055	
Less: bidders seeking to achieve less than 50 % stake	2,339	
Total number of firm-years for common sample	4,716	
Of which		
Nature of acquisition		
Intra-industry	769	
Inter-industry	3,947	
	Number of observations	% of sample
<i>Panel B: Takeover bids by industry</i>		
Consumer nondurables	284	6.0
Consumer durables	135	2.9
Manufacturing	526	11.2
Oil, gas, and coal	238	5.0
Chemicals and allied products	102	2.2
Business equipment	828	17.6
Telephone and television transmission	119	2.5
Utilities	113	2.4
Wholesale, retail, and some services	635	13.5
Healthcare, medical equipment, and drugs	405	8.6
Finance	77	1.6
Others	1,254	26.5
Total	4,716	100.0

Table 1 continued

	Number of observations	% of sample
<i>Panel C: Takeover bids by year</i>		
1977–1980	26	0.5
1981	92	2.0
1982	92	2.0
1983	125	2.6
1984	216	4.6
1985	163	3.5
1986	229	4.9
1987	212	4.5
1988	283	6.0
1989	290	6.1
1990	159	3.4
1991	146	3.1
1992	90	1.9
1993	127	2.7
1994	181	3.8
1995	206	4.4
1996	202	4.3
1997	249	5.3
1998	286	6.1
1999	299	6.3
2000	257	5.4
2001	204	4.3
2002	121	2.6
2003	158	3.3
2004	134	2.8
2005	169	3.6
Total	4,716	100.0

The data consist of takeover bids involving US publicly listed targets from the SDC database. This is combined with Compustat and CRSP data to obtain the final sample. The initial takeover sample consists of 21,453 firm-year observations over the 1977–2005 period. After deleting target observations without Compustat or earnings-quality data, the sample consists of 4,716 observations. Panel A of this table reconciles the initial and final samples. In Panel B the observations are grouped into industries based on Fama–French 12-industry classification

EQ than those involved in negotiated bids, which is consistent with our prediction that bidders are more likely to seek information through negotiations with the target management when the quality of target firm earnings is worse. We explore this prediction in detail next.

5 Empirical results

5.1 Impact of targets' earnings quality on the likelihood of a non-negotiated deal

We examine the relation between earnings quality and the likelihood of non-negotiated bids by estimating the following Probit regression:

Table 2 Descriptive statistics

	Full sample				Intra- versus inter-industry		Non-negotiated versus negotiated	
	Mean	Standard deviation	Median	No. of obs.	Difference	p-value	Difference	p-value
<i>Bid characteristics</i>								
<i>NON-NEGO</i>	0.108	0.310	0	4,716	-0.006	0.626	-	-
<i>PILL</i>	0.020	0.138	0	4,716	0.006	0.296	0.155	0.000
<i>AUCTION</i>	0.114	0.318	0	4,716	-0.058	0.689	0.298	0.000
<i>CASH</i>	0.447	0.497	0	4,716	-0.174	0.000	0.229	0.000
<i>EQUITY</i>	0.128	0.335	0	4,716	0.247	0.000	-0.091	0.000
<i>PCT_EQUITY</i>	0.257	0.414	0	3,420	0.318	0.000	-0.166	0.000
<i>TENDER</i>	0.218	0.413	0	4,716	-0.015	0.363	0.226	0.000
<i>SDC premium</i>	0.529	0.372	0.459	2,383	0.014	0.443	0.014	0.463
<i>Schwert premium</i>	0.480	0.365	0.402	3,063	0.071	0.005	0.003	0.873
<i>Target characteristics</i>								
<i>ROE</i>	-0.042	0.773	0.075	4,716	0.002	0.957	0.122	0.000
<i>SGROW</i>	0.095	0.304	0.065	4,716	0.064	0.000	-0.008	0.451
<i>LIQ</i>	0.244	0.249	0.249	4,716	0.045	0.002	0.008	0.462
<i>DERATIO</i>	0.614	1.757	0.286	4,716	-0.036	0.614	-0.032	0.654
<i>MBRATIO</i>	2.028	3.161	1.359	4,716	0.938	0.000	-0.447	0.000
<i>PERATIO</i>	9.853	31.885	9.654	4,716	-0.654	0.663	2.774	0.097
<i>MARKETCAP</i>	539.52	1,441.33	76.81	4,716	28.24	0.651	187.43	0.012
<i>EQ</i>	-0.058	0.053	-0.041	4,716	-0.015	0.000	0.017	0.000

The sample consists of takeovers of US publicly listed target firms over the 1977–2005 period from the SDC database. A takeover is classified as an intra-industry takeover if bidder and target belong to the same industry, based on Fama and French's 12 industry classification; otherwise it is classified as an inter-industry takeover. A takeover is classified as non-negotiated if the contest is identified as hostile or unsolicited by SDC. All other takeovers are classified as negotiated. The other variables are defined in the appendix. The last four columns report the differences in the bid and target characteristics for (i) intra-industry and inter-industry takeovers and (ii) non-negotiated and negotiated deals. The p-values of the test for differences in means are adjusted for within-firm correlation (Rogers, 1993) and heteroskedasticity

$$\begin{aligned}
 NON_NEGO_{i,t+1} = & \beta_0 + \beta_1 EQ_{i,t} + \beta_2 ROE_{i,t} + \beta_3 SGROW_{i,t} + \beta_4 LIQ_{i,t} \\
 & + \beta_5 DERATIO_{i,t} + \beta_6 MBRATIO_{i,t} + \beta_7 PERATIO_{i,t} \\
 & + \beta_8 SIZE_{i,t} + \varepsilon_{i,t+1}.
 \end{aligned}
 \tag{2}$$

*NON-NEGO*_{*i,t+1*} is a dummy variable that takes the value 1 if the bid is non-negotiated and 0 otherwise. The variable of interest is the lagged earnings quality measure, *EQ*_{*i,t*}. Following Schwert (2000), we control for return on equity (*ROE*), sales growth (*SGROW*), liquidity (*LIQ*), debt-to-equity ratio (*DERATIO*), market-to-book ratio (*MBRATIO*), price-earnings ratio (*PERATIO*), and logarithm of market capitalization (*SIZE*) (See the appendix for details of variable measurement.). We include year dummies to control for time variation in the frequency of

Table 3 Earnings quality and probability of a non-negotiated takeover

	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]
<i>Panel A: All targets</i>				
Constant	−0.665*** (0.245)		−1.145*** (0.257)	
<i>EQ</i>	3.820*** (0.798)	0.655 [6.81]	2.536*** (0.783)	0.420 [4.43]
<i>ROE</i>			0.080*** (0.031)	0.013 [0.96]
<i>SGROW</i>			−0.074 (0.078)	−0.012 [−0.70]
<i>LIQ</i>			0.246** (0.107)	0.041 [2.52]
<i>DERATIO</i>			0.031* (0.017)	0.005 [0.83]
<i>MBRATIO</i>			−0.047*** (0.013)	−0.008 [−2.83]
<i>PERATIO</i>			0.001 (0.001)	0.000 [0.44]
<i>SIZE</i>			0.092*** (0.014)	0.015 [7.89]
Pseudo <i>R</i> squared	0.0471		0.0630	
No. of observations	4,716		4,716	
	Inter-industry		Intra-industry	
	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]
<i>Panel B: Inter-industry versus intra-industry takeovers</i>				
Constant	−1.030*** (0.262)		−7.266*** (0.573)	
<i>EQ</i>	3.389*** (0.871)	0.556 [5.50]	0.337 (1.570)	0.029 [0.39]
<i>ROE</i>	0.069** (0.034)	0.011 [0.81]	0.193** (0.082)	0.017 [1.35]
<i>SGROW</i>	−0.061 (0.094)	−0.001 [−0.55]	−0.128 (0.149)	−0.011 [−0.79]
<i>LIQ</i>	0.210* (0.117)	0.035 [2.10]	0.487* (0.259)	0.042 [2.85]

Table 3 continued

	Inter-industry		Intra-industry	
	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]	Coeff. (stand. error)	Marginal effect [change in prob (%) 10th–90th percentile]
<i>DERATIO</i>	0.026 (0.019)	0.004 [0.69]	0.072 (0.045)	0.006 [0.97]
<i>MBRATIO</i>	-0.059*** (0.015)	-0.010 [-3.22]	-0.030 (0.029)	-0.003 [-1.51]
<i>PERATIO</i>	0.001 (0.001)	0.000 [0.64]	-0.001 (0.002)	0.000 [-0.78]
<i>SIZE</i>	0.087*** (0.015)	0.014 [7.48]	0.126*** (0.042)	0.011 [5.63]
Pseudo <i>R</i> squared	0.0685		0.1275	
No. of observations	3,947		769	

This table presents the regression estimates from a Probit model predicting whether takeover bids for exchange-listed target firms are non-negotiated. The sample consists of 4,716 takeover bids over the 1977–2005 period, obtained from SDC. The dependent variable is a dummy variable that equals 1 when a non-negotiated bid is made for the target firm and 0 otherwise. We refer to takeover bids as non-negotiated if SDC classifies the bid as either hostile or unsolicited. The predictive variables, pertaining to the target firm, are defined in the appendix. In Panel B, a takeover is classified as an intra-industry takeover if bidder and target belong to the same industry based on Fama–French 12 industry classification; otherwise it is classified as an inter-industry takeover. Year dummies are included in the regressions but are not reported. The marginal effect column reports the marginal effect of the explanatory variable on the estimated probability, evaluated at the sample means of the explanatory variables. The number in brackets under the marginal effects indicates the change in probability that the takeover is non-negotiated (as a percentage) when the independent variable changes from its 10th percentile to its 90th percentile value. Standard errors (in parentheses) are White (1980) heteroskedasticity-adjusted and robust to within-firm correlation (Rogers (1993)/clustered standard errors). ***, **, * indicate that the parameter estimate is significantly different from zero at the 1, 5, or 10 % level, respectively

non-negotiated bids (Holmstrom and Kaplan 2001) and correct the standard errors for within-firm correlation (Rogers 1993) and for heteroscedasticity.

The results from estimating Eq. (2) for the full takeover sample are reported in Panel A of Table 3. The coefficient on *EQ* is positive and statistically significant, both when *EQ* is the only explanatory variable and when we include control variables.²⁶ The economic significance of *EQ* is substantial [columns (ii) and (iv)]: an increase in target-firm earnings quality from the 10th percentile to the 90th percentile increases the probability of a non-negotiated bid by 4.43 % points, from 6.82 % (10th percentile) to 11.25 % (90th percentile). The only variable with a higher marginal effect is *SIZE*, for which the probability of a non-negotiated bid increases by 7.89 % points, from 6.17 % (10th percentile) to 14.06 % (90th percentile).

²⁶ These results are insensitive to including a dummy for toehold (which equals 1 if the percentage of target shares owned by the bidder prior to the acquisition is greater than 5 % and zero otherwise.) and a dummy for clean-up (which equals 1 if the bidder owns more than 50 % of the target prior to the bid and zero otherwise) as additional explanatory variables in the regression. The coefficients on toehold and clean-up are statistically insignificant.

In general, the coefficients on the control variables are in line with the findings in prior research and suggest that negotiated bids are more likely for target firms that are more difficult to value (e.g., Schwert 2000; Dong et al. 2006). For example, negotiated bids are more likely for targets with a lower fraction of liquid assets, higher market-to-book ratios, lower profitability (*ROE*), and smaller market capitalization.

In Panel B of Table 3, we estimate Eq. (2) separately for inter- and intra-industry takeovers, in order to gauge the relative importance of the asymmetric uncertainty vis-à-vis symmetric uncertainty components of earnings quality. The coefficient on *EQ* is substantially larger for inter-industry takeovers than for intra-industry takeovers, which translates into large differences in economic significance: an increase in target firm earnings quality from the 10th percentile to the 90th percentile increases the probability of a non-negotiated bid by 5.50 % for inter-industry takeovers but by only 0.39 % for intra-industry takeovers. This is consistent with asymmetric uncertainty playing a more important role than symmetric uncertainty in the decision of whether or not to make a non-negotiated bid.

Overall, the results show that negotiated takeovers are more likely when the target's earnings quality leads to greater asymmetric uncertainty.

5.2 Impact of targets' earnings quality on bid premium

Next, we examine the relation between earnings quality and bid premium by regressing the bid premium on earnings quality and other control variables (Schwert 2000; Barger et al. 2008; see the Appendix):

$$\begin{aligned}
 PREM_{i,t+1} = & \delta_0 + \delta_1^{neg} (1 - NON_NEGO_{i,t+1}) * EQ_{i,t} \\
 & + \delta_1^{non-neg} (NON_NEGO_{i,t+1}) * EQ_{i,t} \\
 & + \delta_2 ROE_{i,t} + \delta_3 SGROW_{i,t} + \delta_4 LIQ_{i,t} + \delta_5 DERATIO_{i,t} \\
 & + \delta_6 MBRATIO_{i,t} + \delta_7 PERATIO_{i,t} + \delta_8 SIZE_{i,t} + \delta_9 NON_NEGO_{i,t+1} \\
 & + \delta_{10} PILL_{i,t+1} + \delta_{11} AUCTION_{i,t+1} + \delta_{12} CASH_{i,t+1} \\
 & + \delta_{13} TENDER_{i,t+1} + \delta_{14} PUBLIC_{i,t+1} + v_{i,t+1},
 \end{aligned}
 \tag{3}$$

where $PREM_{i,t+1}$ refers to either *SDC premium* or *Schwert premium*, as described in Sect. 3. To test for differences across negotiated and non-negotiated takeovers, we allow the coefficient on earnings quality to differ for negotiated bids and non-negotiated bids. We expect the coefficient on $EQ_{i,t}$ to be negative for negotiated takeovers only. As before, the regressions include year dummies to control for any time variation in bid premiums, and the standard errors are corrected for within-firm dependence and for heteroscedasticity.²⁷

Our results for the full takeover sample are presented in Panel A of Table 4. Overall, we find a negative relation between earnings quality and premium, irrespective of the premium definition (Panel A, columns (i) and (ii)). The economic

²⁷ Since the premium is required to be between 0 and 200 %, we tested the sensitivity of our results to the use of Tobit. The use of Tobit instead of OLS does not qualitatively affect the results.

Table 4 Earnings quality and takeover premium

	(i) SDC premium	(ii) Schwert premium	(iii) SDC premium	(iv) Schwert premium
<i>Panel A: All targets</i>				
Constant	0.411*** (0.111)	0.531*** (0.031)	0.411*** (0.111)	0.529*** (0.031)
<i>EQ</i>	-0.431*** (0.169)	-0.688*** (0.166)		
$(1 - NON-NEGO) \times EQ$			-0.414** (0.175)	-0.741***§ (0.174)
$(NON-NEGO) \times EQ$			-0.581 (0.459)	-0.071 (0.389)
<i>ROE</i>	-0.024 (0.018)	-0.054*** (0.016)	-0.024 (0.018)	-0.054*** (0.016)
<i>SGROW</i>	-0.077*** (0.029)	-0.022 (0.028)	-0.077*** (0.029)	-0.022 (0.028)
<i>LIQ</i>	-0.022 (0.038)	-0.043 (0.035)	-0.022 (0.038)	-0.043 (0.035)
<i>DERATIO</i>	-0.002 (0.007)	-0.006 (0.006)	-0.002 (0.007)	-0.006 (0.006)
<i>MBRATIO</i>	-0.002 (0.004)	-0.003 (0.003)	-0.002 (0.004)	-0.003 (0.003)
<i>PERATIO</i>	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000* (0.000)
<i>SIZE</i>	-0.032*** (0.006)	-0.033*** (0.004)	-0.032*** (0.006)	-0.033*** (0.004)

Table 4 continued

	(i) SDC premium	(ii) Schwert premium	(iii) SDC premium	(iv) Schwert premium
<i>NON-NEGO</i>	0.003 (0.022)	0.023 (0.021)	-0.005 (0.032)	0.053** (0.027)
<i>PILL</i>	0.002 (0.040)	-0.024 (0.038)	0.004 (0.040)	-0.031 (0.038)
<i>AUCTION</i>	0.099*** (0.025)	0.045* (0.024)	0.099*** (0.025)	0.047** (0.024)
<i>CASH</i>	-0.038** (0.019)	-0.041*** (0.015)	-0.037*** (0.019)	-0.041*** (0.015)
<i>TENDER</i>	0.077*** (0.018)	0.054*** (0.015)	0.077*** (0.018)	0.053*** (0.015)
<i>PUBLIC</i>	0.050*** (0.018)	0.013 (0.014)	0.050*** (0.018)	0.013 (0.014)
Adjusted R^2	0.0955	0.1085	0.0955	0.1091
No. of observations	2,346	3,021	2,346	3,021

Table 4 continued

	Inter-industry		Intra-industry	
	(i) Schwert premium	(ii) Schwert premium	(iii) Schwert premium	(iv) Schwert premium
<i>Panel B: Inter-industry vs. intra-industry takeovers</i>				
Constant	0.510*** (0.034)	0.486*** (0.046)	0.463*** (0.184)	0.464*** (0.185)
<i>EQ</i>	-0.857*** (0.192)		-0.076 (0.310)	
$(1 - \text{NON-NEGO}) \times \text{EQ}$		-0.940***,§§ (0.197)		-0.070 (0.342)
$(\text{NON-NEGO}) \times \text{EQ}$		0.434 (0.558)		-0.114 (0.482)
<i>ROE</i>	-0.053*** (0.018)	-0.053*** (0.018)	-0.059* (0.033)	-0.059* (0.033)
<i>SGROW</i>	0.003 (0.034)	0.003 (0.034)	-0.124** (0.050)	-0.124** (0.050)
<i>LIQ</i>	-0.059 (0.039)	-0.058 (0.039)	0.005 (0.078)	0.005 (0.078)
<i>DERATIO</i>	-0.001 (0.006)	-0.001 (0.006)	-0.032* (0.018)	-0.032* (0.019)
<i>MBRATIO</i>	-0.007* (0.004)	-0.007* (0.004)	0.009 (0.007)	0.009 (0.007)
<i>PERATIO</i>	0.000 (0.000)	0.000 (0.000)	-0.001* (0.000)	-0.001* (0.000)
<i>SIZE</i>	-0.030*** (0.005)	-0.031*** (0.005)	-0.045*** (0.011)	-0.045*** (0.011)

Table 4 continued

	Inter-industry		Intra-industry	
	(i) Schwert premium	(ii) Schwert premium	(iii) Schwert premium	(iv) Schwert premium
<i>NON-NEGO</i>	0.006 (0.022)	0.051* (0.031)	0.201*** (0.052)	0.198*** (0.068)
<i>PILL</i>	-0.023 (0.042)	-0.037 (0.041)	-0.112 (0.084)	-0.111 (0.084)
<i>AUCTION</i>	0.066** (0.030)	0.066** (0.027)	-0.088* (0.047)	-0.089* (0.047)
<i>CASH</i>	-0.024 (0.016)	-0.024 (0.016)	-0.120*** (0.038)	-0.120*** (0.038)
<i>TENDER</i>	0.056*** (0.016)	0.055*** (0.016)	0.068* (0.041)	0.068* (0.041)
<i>PUBLIC</i>	0.007 (0.015)	0.007 (0.015)	0.231 (0.166)	0.231 (0.166)
Adjusted R ²	0.1124	0.1142	0.1692	0.1692
No. of observations	2,488	2,488	533	533

This table presents OLS regression estimates from regressing the takeover premium on earnings quality and a set of explanatory variables that control for the characteristics of the target and the takeover bid (See the appendix for definition of the variables.). The dependent variable in Panel A is *SDC premium* in Models (i) and (iii) and *Schwert premium* in Models (ii) and (iv). In Panel B, the dependent variable is Schwert Premium. Extreme observations with premiums larger than 200 % or smaller than 0 % are excluded. In Panel B, a takeover is classified as an intra-industry takeover if bidder and target belong to the same industry based on Fama-French 12 industry classification; otherwise it is classified as an inter-industry takeover. Year dummies are included in the regressions but not reported. Standard errors (in parentheses) are White (1980) heteroskedasticity-adjusted and robust to within-firm correlation (Rogers (1993)/clustered standard errors). ***, **, * indicate that the parameter estimate is significantly different from zero at the 1, 5, or 10 % level, respectively. \$\$\$, \$\$, \$ indicate that the coefficients differ across the *Negotiated* and *Non-negotiated* takeovers at the 1, 5, and 10 % significance levels

significance of this relation is considerable. For example, the coefficient of -0.69 in column (ii) indicates that when a target's earnings quality is one standard deviation below the mean *EQ*, the premium offered increases by 3.65 % (i.e., 7.6 % [= $0.0365/0.48$] relative to the average *Schwert premium* reported in Table 2). This negative relation between premium and earnings quality is driven by the negotiated takeovers; the coefficient on earnings quality is insignificant for non-negotiated bids. Thus it seems that bidders are willing to offer higher premiums when uncertainty arising from the target's informational advantage is mitigated through negotiations. The difference across negotiated and non-negotiated bids is consistent with the asymmetric uncertainty component of earnings quality being a driver of bid premium.

The coefficients on the control variables are generally consistent with prior work. For example, smaller targets, deals involving multiple bidders, tender offers, and bids by public bidders involve higher bid premiums (e.g., Schwert 2000; Barger et al. 2008).

We explore the source of uncertainty driving the results more directly by estimating Eq. (3) separately for the intra-industry and inter-industry takeover samples.²⁸ The results in Panel B of Table 4 indicate that the coefficient on *EQ* for inter-industry takeovers (-0.857) is more than ten times larger than that for intra-industry takeovers (-0.076), a statistically and economically significant difference. Economically, a one standard deviation decrease in *EQ* over its mean implies a 3.98 % increase in the premium offered for inter-industry takeovers vis-à-vis an increase of 0.43 % for intra-industry takeovers. The negative relation between bid premium and earnings quality in inter-industry takeovers is driven by the negotiated takeovers; for non-negotiated takeovers, the coefficient is positive (albeit insignificant) and statistically different from the coefficient of -0.940 in negotiated takeovers. Thus, whereas the resolution of asymmetric uncertainty leads to higher premiums in negotiated deals, targets in non-negotiated deals do not reap this benefit, since asymmetric uncertainty remains largely unresolved. Finally, for intra-industry takeovers, the coefficients of earnings quality are statistically insignificant across both negotiated and non-negotiated bids, suggesting that symmetric uncertainty in financial reports is unrelated to bid premiums.

Overall, both the comparison of results across negotiated and non-negotiated bids and the comparison across inter-industry and intra-industry takeovers yield consistent conclusions: the asymmetric uncertainty component of earnings quality is a prime determinant of bid premium.

5.3 Impact of targets' earnings quality on method of payment

To test the relation between earnings quality and method of payment, we estimate the following Tobit regression:²⁹

²⁸ The dependent variable in these regressions is the Schwert premium. We obtain qualitatively similar results using the SDC premium.

²⁹ We use Tobit because the dependent variable is censored to be between 0 and 100 %. However, our conclusions are unaffected if we use ordinary least squares regressions instead.

$$\begin{aligned}
PCT_EQUITY_{i,t+1} = & \delta_0 + \delta_1^{neg} (1 - NON_NEGO_{i,t+1}) * EQ_{i,t} \\
& + \delta_1^{non-neg} (NON_NEGO_{i,t+1}) * EQ_{i,t} \\
& + \delta_2 MBRATIO_{i,t} + \delta_3 SIZE_{i,t} + \delta_4 NON_NEGO_{i,t+1} + \delta_5 PILL_{i,t+1} \\
& + \delta_6 AUCTION_{i,t+1} + \delta_7 TENDER_{i,t+1} + \delta_8 PREM_{i,t+1} \\
& + \delta_9 ACQ_MBRATIO_{i,t} + \delta_{10} ACQ_SIZE_{i,t} + \delta_{11} ACQ_LEV_{i,t} \\
& + \delta_{12} ACQ_FCF_{i,t} + \delta_{13} REL_SIZE_{i,t} + v_{i,t+1},
\end{aligned} \tag{4}$$

where $PCT_EQUITY_{i,t+1}$ represents the percentage of the bid price offered in stock. Following prior research (e.g., Martin 1996; Dong et al. 2006), we include several control variables (defined in Table 5) and year dummies. As before, we allow the coefficient on earnings quality to differ across negotiated and non-negotiated takeovers. We estimate the regression in Eq. (4) for the full sample and for a subsample of firms where the target's market capitalization is at least 15 % of that of the bidder, since the effects of over- or underpayment are likely to be economically more important in acquisitions of larger targets.

Panel A of Table 5 presents the results for the full sample.³⁰ We find a negative relation between the percentage of stock and earnings quality for negotiated takeovers, indicating that negotiations do not completely resolve uncertainty, and consequently stock tends to be used as a method of payment in takeovers involving greater asymmetric uncertainty. But, surprisingly, earnings quality and method of payment are unrelated in non-negotiated bids, where asymmetric uncertainty remains unresolved. We explore this result in greater detail in our subsample analysis below.

Panel B of Table 5 reports the regression estimates separately for the inter-industry subsample. The coefficient of EQ for inter-industry, non-negotiated takeovers is significantly larger in magnitude than for the combined sample. Within inter-industry takeovers, the effect of EQ is larger for non-negotiated takeovers; in regression (iv), for example, the coefficient of EQ for non-negotiated takeovers is -11.048 , in magnitude almost twice the corresponding coefficient for negotiated takeovers (-5.276). However, the difference is not significant at conventional levels, which we speculate is due to power issues and due to the appeal of cash payment as a signaling mechanism in the more competitive non-negotiated takeovers, as suggested by Berkovitch and Narayanan (1990).

We conduct the same analysis for the sample of intra-industry takeovers. Consistent with our Hypothesis 3A, we find insignificant EQ coefficients for both negotiated and non-negotiated takeovers in this subsample (The results are untabulated to save space).

³⁰ The number of observations in the regression is lower than the number of observations for which we have PCT_EQUITY data (as reported in Table 2) owing to the elimination of takeovers by private bidders and of takeovers for which acquirer characteristics (size, leverage, book-to-market, or free cash flow) or Schwert premium are missing.

Table 5 Earnings quality and method of payment

	(i) All bidders	(ii) If relative market size >15 %	(iii) All bidders	(iv) If relative market size >15 %
<i>Panel A: All targets</i>				
Constant	-2.244*** (0.281)	-2.048*** (0.290)	-1.188*** (0.314)	-1.218*** (0.300)
$(1 - \text{NON-NEGO}) \times \text{EQ}$	-1.875** (0.943)	-2.504** (1.048)	-1.464 (1.147)	-3.638***.§§ (1.437)
$(\text{NON-NEGO}) \times \text{EQ}$	-1.942 (3.095)	-1.719 (2.779)	1.299 (3.067)	1.460 (2.305)
<i>MBRATIO</i>	0.051*** (0.014)	0.046*** (0.014)	0.023 (0.018)	0.024 (0.017)
<i>SIZE</i>	0.075*** (0.027)	0.065** (0.028)	0.214*** (0.044)	0.105 (0.093)
<i>NON-NEGO</i>	-0.519** (0.231)	-0.420** (0.213)	-0.305 (0.254)	-0.084 (0.203)
<i>PILL</i>	-0.027 (0.395)	0.077 (0.355)	-0.292 (0.418)	-0.174 (0.309)
<i>AUCTION</i>	-0.109 (0.150)	-0.131 (0.145)	0.011 (0.173)	0.033 (0.146)
<i>TENDER</i>	-2.332*** (0.148)	-1.978*** (0.147)	-1.884*** (0.161)	-1.226*** (0.146)
<i>Schwert premium</i>	-0.150** (0.068)	-0.168*** (0.066)	-0.160* (0.097)	-0.269*** (0.103)
<i>ACQ_MBRATIO</i>			0.120*** (0.020)	0.057*** (0.022)
<i>ACQ_SIZE</i>			-0.217*** (0.040)	-0.068 (0.089)
<i>ACQ_DERATIO</i>			-0.216*** (0.048)	-0.165*** (0.042)
<i>ACQ_FCF</i>			-1.447*** (0.521)	-1.216*** (0.459)
<i>REL_SIZE</i>			-0.085 (0.054)	-0.054 (0.049)
Pseudo <i>R</i> squared	0.2106	0.2379	0.2157	0.2612
No. of observations	2,030	1,390	1,169	578
	(i) All bidders	(ii) If relative market size >15 %	(iii) All bidders	(iv) If relative market size >15 %
<i>Panel B: Inter-industry takeovers</i>				
Constant	-2.328*** (0.333)	-2.279*** (0.354)	-1.364*** (0.413)	-1.447*** (0.400)
$(1 - \text{NON-NEGO}) \times \text{EQ}$	-1.647 (1.271)	-2.152* (1.323)	-2.086 (1.945)	-5.276** (2.509)
$(\text{NON-NEGO}) \times \text{EQ}$	-10.173* (5.928)	-10.407* (5.522)	-8.476 (8.481)	-11.048* (6.582)
<i>MBRATIO</i>	0.043** (0.019)	0.031* (0.019)	0.032 (0.030)	-0.001 (0.030)

Table 5 continued

	(i) All bidders	(ii) If relative market size >15 %	(iii) All bidders	(iv) If relative market size >15 %
<i>SIZE</i>	0.089*** (0.033)	0.092*** (0.034)	0.186*** (0.062)	0.101 (0.132)
<i>NON-NEGO</i>	-0.739** (0.327)	-0.713** (0.312)	-0.527 (0.430)	-0.405 (0.339)
<i>PILL</i>	-0.235 (0.496)	0.216 (0.460)	0.053 (0.598)	-0.017 (0.431)
<i>AUCTION</i>	-0.287 (0.189)	0.252 (0.185)	-0.061 (0.250)	0.021 (0.209)
<i>TENDER</i>	-2.160*** (0.177)	-2.021*** (0.182)	-1.574*** (0.211)	-1.014*** (0.194)
<i>Schwert premium</i>	-0.181** (0.082)	-0.173** (0.079)	-0.202 (0.163)	-0.363** (0.179)
<i>ACQ_MBRATIO</i>			0.081*** (0.029)	0.038 (0.040)
<i>ACQ_SIZE</i>			-0.163*** (0.056)	-0.025 (0.124)
<i>ACQ_DERATIO</i>			-0.145* (0.076)	-0.130* (0.073)
<i>ACQ_FCF</i>			-1.320 (0.917)	-1.714* (1.022)
<i>REL_SIZE</i>			-0.062 (0.062)	-0.036 (0.058)
Pseudo <i>R</i> squared	0.2065	0.2269	0.1823	0.2379
No. of observations	1,372	1,060	581	286

This table presents Tobit estimates from regressing the percentage of the proceeds paid using equity on earnings quality and a set of explanatory variables. The dependent variable is *PCT_EQUITY*, the percentage of proceeds paid with the bidder's equity. The variables *MBRATIO* and *SIZE* refer to the characteristics of the target firm. *ACQ_MBRATIO* is defined as the acquirer's ratio of market value of equity to book value of equity (data 24 (price) × data 25 (common shares outstanding)/data 60 (book value of equity)). *ACQ_SIZE* is the acquirer's log of market capitalization from CRSP on day -60 relative to the announcement date (day 0). *ACQ_DERATIO* is defined as the ratio of long-term debt to equity, data9 (long-term debt)/data60 (book value of equity). *ACQ_FCF* is defined as [data13 (operating income before depreciation) - data15 (interest expense) - data16 (income taxes) - data128 (capital expenditures)]/data6 (total assets). *REL_SIZE* is the ratio of the market capitalization for the target to that of the bidder, both measured on day -60 relative to the announcement date (day 0). All accounting variables are taken as of the latest fiscal year ending at least 90 days before the acquisition announcement date. All other variables are defined in the appendix. In Models (ii) and (iv), observations for which *REL_SIZE* < 15 % are dropped from the regression. In Panel B a takeover is classified as an intra-industry takeover if bidder and target belong to the same industry, based on Fama-French 12 industry classification; otherwise it is classified as an inter-industry takeover. Year dummies are included in the regressions but are not reported. Standard errors are reported within parentheses. ***, **, * indicate that the parameter estimate is significantly different from zero at the 1, 5, or 10 % level, respectively. §§ indicates that the coefficients differ across the *Negotiated* and *Non-negotiated* takeovers at the 5 % significance level

Overall, we conclude that asymmetric uncertainty in financial reports plays an important role in influencing the method of payment in both negotiated and non-negotiated bids of inter-industry takeovers.

6 Further tests and alternative explanations

6.1 Additional evidence on the role of asymmetric and symmetric uncertainties

In order to test the robustness of the inferences derived from inter- and intra-industry analyses, we use a two-stage research design to capture the influence of the asymmetric and symmetric uncertainty components of financial reporting quality. In the first stage, we regress earnings quality either on bid-ask spread (a proxy for asymmetric uncertainty) or on analyst dispersion (a proxy for symmetric uncertainty). In the second-stage regression, we replace the *EQ* variable in Eqs. (2)–(4) with the fitted values of *EQ* from the first-stage regression. Relative to the inter- and intra-industry analyses, this approach provides a more direct link between the components of *EQ* and bidder decisions. However, the downside of this approach is the reliance on relatively noisy proxies for asymmetric and symmetric components of uncertainty. This approach also imposes greater data requirements—data on bid-ask spreads and on analyst coverage—which limits the sample size.

The results using this two-stage approach are reported in Table 6. The explanatory variables in columns (i), (iii), and (v) are the fitted values from regressing *EQ* on bid-ask spreads, which we interpret as the asymmetric uncertainty component of earnings quality, and those in columns (ii), (iv), and (vi) are the fitted values from regressing *EQ* on analyst-forecast dispersion, which captures the symmetric uncertainty component of earnings quality. This table does not tabulate the coefficient estimates of control variables, as they are not much different from those reported in earlier tables.

Consistent with the conclusions drawn in the earlier section, we find that the asymmetric component of earnings quality is the main driver of bidders' decisions. From columns (i) and (ii), we note that the probability of a non-negotiated deal is positively correlated with the asymmetric component of earnings quality but is at best weakly correlated with the symmetric component. In regressions of the bid premium, the coefficient on the asymmetric component is -6.55 and that on the symmetric component is -22.98 (reported in columns (iii) and (iv) respectively) for negotiated takeovers, suggesting that the premium increases with both asymmetric and symmetric components of uncertainty. In contrast, the coefficient on the asymmetric component is insignificant in non-negotiated takeovers, consistent with non-resolution of asymmetric uncertainty in these takeovers. The symmetric component of earnings quality has a positive coefficient for non-negotiated takeovers. Since prior theoretical studies provide mixed predictions for the relation between symmetric uncertainty and bid premium, we cannot resolve the puzzling finding of opposite signs for the coefficients on symmetric uncertainty among non-negotiated takeovers. Lastly, we find little relation between either asymmetric uncertainty or symmetric uncertainty components of earnings quality and the method of payment. However, given the small sample sizes employed in the method of payment regressions, we are wary of drawing strong conclusions from these regressions.

Table 6 Asymmetric and symmetric components of earnings quality

Dependent variable	NON-NEGO (Probit)		Schwert premium (OLS)		PCT_EQUITY (Tobit; relative market > 15)	
	(i) Bid-ask spread	(ii) Analyst dispersion	(iii) Bid-ask spread	(iv) Analyst dispersion	(v) Bid-ask spread	(vi) Analyst dispersion
<i>Fitted EQ</i>	18.800*** (6.772)	31.272* (17.074)				
$(1 - \text{NON-NEGO}) \times \text{fitted EQ}$			-6.557***:§§§ (1.844)	-22.948***:§§§ (4.761)	4.024 (11.954)	56.782* (31.745)
$(\text{NON-NEGO}) \times \text{fitted EQ}$			3.394 (4.740)	37.071*** (13.135)	10.500 (49.701)	40.758 (165.172)
Control variables	Yes, as in Table 3, Panel A, (ii)	Yes, as in Table 3, Panel A, (ii)	Yes, as in Table 4, Panel A, (iv)	Yes, as in Table 4, Panel A, (iv)	Yes, as in Table 5, Panel A, (iv)	Yes, as in Table 5, Panel A, (iv)
Adjusted R ²	0.0535	0.0522	0.1091	0.1574	0.2232	0.2377
No. of observations	3,099	1,687	1,998	1,141	422	277

This table presents the coefficients from regression models using alternative measures of the symmetric and asymmetric components of financial reporting quality. In columns (i), (iii), and (v), *Fitted EQ* is the fitted value from a regression of *EQ* on bid-ask spread, which proxies for the asymmetric component of *EQ*. In columns (ii), (iv), and (vi), *Fitted EQ* is the fitted value from a regression of *EQ* on analyst dispersion, which proxies for the symmetric component of *EQ*. In Models (i) and (ii), the dependent variable in the Probit regression is *NON-NEGO*, which equals 1 if the takeover is non-negotiated and 0 otherwise. The control variables in these regressions are the same as in Model (ii) of Panel A in Table 3. Models (iii) and (iv) present OLS regression coefficients with *Schwert premium* as the dependent variable. The control variables in these regressions are the same as in Model (iv) of Panel A in Table 4. In Models (v) and (vi), the dependent variable in the Tobit regressions is *PCT_EQUITY*, the percentage of proceeds paid with equity. The control variables in these regressions are the same as in Model (iv) of Panel A in Table 5. Standard errors (in parentheses) are White (1980) heteroskedasticity-adjusted and robust to within-firm correlation (Rogers (1993)/clustered standard errors). ***, **, *, indicate that the parameter estimate is significantly different from zero at the 1 %, 5, or 10 % level, respectively. §§§ indicates that the coefficients differ across the *Negotiated* and *Non-negotiated* takeovers at the 1 % significance level

Overall, the results for the probability of non-negotiated takeovers and for bid premium are largely consistent with those derived in Sect. 5. We continue to find that the asymmetric component of earnings quality is the main driver of the takeover decisions that we study.

6.2 Innate versus discretionary components of financial reporting quality

Based on Rogo (2009), we have decomposed earnings quality into symmetric and asymmetric uncertainty components. We have relied on this decomposition as negotiations can resolve one of these components (asymmetric component) but not the other. However, prior studies have primarily decomposed earnings quality into innate and discretionary components, based on whether the quality is determined by business fundamentals or by managerial reporting strategy (e.g., Francis et al. 2005). We note that this decomposition is not equivalent to splitting earnings quality into symmetric and asymmetric components, especially given that the asymmetric uncertainty component includes aspects of both discretionary and innate components. In fact, there are cases where business fundamentals cause poor financial reporting quality, leading to increased uncertainty in firm value, but where the uncertainty can be (partly) resolved by accessing private information. For instance, a firm with lumpiness in its selling activities, or with long operating cycles, might be seen by outsiders as having volatile cash flows and poor reporting quality. However, the cash flows could be predictable by that firm's managers based on their knowledge of sales order book and internal production schedules, which are reflected in financial reports only with a delay. Lastly, the inability of accounting standards to reflect underlying business transactions might lead to poor financial reporting quality. But this limitation can be potentially overcome if one has access to the firm's underlying books of accounts.

Thus, while our primary hypotheses do not apply directly to innate or discretionary components of earnings quality, for completeness this subsection evaluates whether bidders' decisions are driven by innate or by discretionary components of accruals.

We conjecture that the effect of the innate component is likely to be stronger. Prior work has shown that managers use the reporting discretion accorded by accounting standards to better signal their private information about the firm's future prospects (e.g., Subramanyam 1996; Chaney et al. 1998), as well as to reduce the transparency of the firm's financial reports. Even in cases where managers use their reporting discretion opportunistically, market participants seem to anticipate the reversal of accruals in some settings (Defond and Park 2001; Shivakumar 2000). Since bidders, either by themselves or through their takeover advisors, are likely to be better at evaluating financial reports and at separating discretionary and innate components than the average market participant, we expect that bidders' decisions will be more (less) influenced by the innate (discretionary) component of earnings quality.

To test this prediction, we first decompose earnings quality into discretionary and innate components, following the approach in Francis et al. (2005), and then

Table 7 Innate and discretionary components of earnings quality

Dependent variable	(i) <i>NON-NEGO</i> (Probit)	(ii) <i>Schwert</i> <i>premium</i> (OLS)	(iii) <i>PCT_EQUITY</i> (Tobit; relative market >.15)
<i>Innate EQ</i>	7.699*** (1.543)		
<i>Discretionary EQ</i>	1.628** (0.834)		
(1 – <i>NON-NEGO</i>) × <i>Innate</i>		–1.860*** (0.387)	–9.557*** (3.160)
(<i>NON-NEGO</i>) × <i>Innate</i>		–1.083 (1.093)	–2.895 (7.818)
(1 – <i>NON-NEGO</i>) × <i>Discretionary</i>		–0.513*** (0.195)	–2.819* (1.543)
(<i>NON-NEGO</i>) × <i>Discretionary</i>		0.097 (0.503)	2.158 (2.905)
Control variables	Yes, as in Table 3, Panel A, (ii)	Yes, as in Table 4, Panel A, (iv)	Yes, as in Table 5, Panel A, (iv)
Adjusted R^2	0.0681	0.1135	0.2651
No. of observations	4,705	3,014	578

This table presents the coefficients from regression models using the innate and discretionary components of *EQ* as explanatory variables. *Innate EQ* and *Discretionary EQ* are estimated as in Francis et al. (2005). In Model (i) the dependent variable in the Probit regression is *NON-NEGO*, which equals 1 if the takeover is non-negotiated and 0 otherwise. The control variables in this regression are the same as in Model (ii) of Panel A in Table 3. Model (ii) presents OLS regression coefficients with *Schwert premium* as the dependent variable. The control variables in this regression are the same as in Model (iv) of Panel A in Table 4. In Model (iii), the dependent variable in the Tobit regressions is *PCT_EQUITY*, the percentage of proceeds paid with equity. The control variables in this regression are the same as in Model (iv) of Panel A in Table 5. Standard errors (in parentheses) are White (1980) heteroskedasticity-adjusted and robust to within-firm correlation (Rogers (1993)/clustered standard errors). ***, **, * indicate that the parameter estimate is significantly different from zero at the 1, 5, or 10 % level, respectively

re-estimate Eqs. (2)–(4) after replacing *EQ* with its two components.³¹ The results are reported in Table 7. We find that the decision to engage in negotiations is driven mostly by the innate component of earnings quality (column (i)). Likewise, the innate component is the main driver of the higher premium (column (ii)) and the greater use of stock as a method of payment (column (iii)) in negotiated takeovers of targets with poorer earnings quality.

In sum, the takeover decisions that we examine are influenced more by the innate component of earnings quality than by the discretionary component, especially when information asymmetry is high.

³¹ We do not report the subsample analyses of inter-industry and intra-industry takeovers, to conserve space. The subsample results indicate that most of the results are driven by inter-industry takeovers.

6.3 Robustness tests

In untabulated analyses, we have verified that our results are robust to (1) excluding financials and utilities, (2) including only targets with a share price greater than \$2.00, (3) including only targets with market capitalization greater than \$10 million, (4) including only successful bids, and (5) deleting multiple bids. We have also tested the sensitivity of our conclusions to a variety of alternative measures of earnings quality: (1) *EQ* measured using Dechow and Dichev's (2002) model, (2) *EQ* defined as the predictive ability of earnings for future cash flows, and (3) *EQ* defined as the predictive ability of accruals and cash flows for future cash flows. Regardless of the specific model employed to measure earnings quality, we find that earnings quality affects takeover decisions and that the effect is strongest for the asymmetric component of earnings quality.

A potential concern, however, may be our single focus on earnings as opposed to overall reporting quality, even though Francis et al. (2008) show that earnings quality is indeed a good proxy for overall reporting quality. To verify the robustness of our conclusions to a broader definition of reporting quality, we construct an index that aggregates a variety of financial reporting quality attributes: (i) accruals quality based on Francis et al. (2005), (ii) Watts and Khan's (2009) timely gain recognition measure, and (iii) timely loss recognition, (iv) an indicator for Big 5 auditor, (v) number of business segments, (vi) number of geographical segments, (vii) proportion of years with losses in the prior 5-year period, (viii) volatility of cash flows, (ix) volatility of stock returns, (x) volatility of net income, and (xi) volatility of sales. Our earlier results continue to hold for this broader measure of financial reporting quality (Table 8), which assuages concerns about the paper's focus on earnings quality.

A final concern is whether our results simply reflect the target's corporate governance or managerial ownership structure. Prior studies have pointed to a link between financial reporting quality and various governance characteristics, as well as between takeover premiums and managerial ownership structure. For example, Bushman et al. (2004) show that corporate governance and reporting quality act as substitutes for a firm, with demands on governance systems increasing as financial reporting quality decreases. In contrast, Klein (2002) shows that corporate governance places limits on the ability of managers to manipulate reported numbers, implying a positive correlation between reporting quality and corporate governance. Also, Cotter and Zenner (1994) document a negative relation between managerial ownership and takeover premium, while Warfield et al. (1995) find managerial ownership to be positively correlated with earnings quality.

To examine the robustness of our results to these concerns, we include in our regressions variables that proxy for governance and managerial ownership in the target firms. We use two measures of corporate governance: (i) the Gompers et al. (2003) corporate governance index, and (ii) board characteristics employed by Bange and Mazzeo (2004). We define managerial ownership as the sum of common and restricted shares for all executives in a firm, divided by shares outstanding for the firm.³²

³² We thank Andrew Metrick for providing the data on the corporate governance index. The board characteristics we include are (i) board size, (ii) whether the majority of the board consists of independent

Table 8 Alternative measure of financial reporting quality

Dependent variable	(i) <i>NON-NEGO</i> (Probit)	(ii) <i>SDC premium</i> (OLS)	(iii) <i>Schwert premium</i> (OLS)	(iv) <i>PCT_EQUITY</i> (Tobit; all bidders)	(v) <i>PCT_EQUITY</i> (Tobit; if relative market size >15 %)
<i>I_INDEX</i>	0.113*** (0.028)				
(1 - <i>NON-NEGO</i>) × <i>I_INDEX</i>		-0.042*** (0.009)	-0.061*** (0.007)	-0.113** (0.055)	-0.231***-§§ (0.061)
(<i>NON-NEGO</i>) × <i>I_INDEX</i>		-0.024 (0.018)	-0.032 (0.021)	0.034 (0.147)	0.058 (0.115)
Control variables	Yes, as in Table 3, Panel A, (ii)	Yes, as in Table 4, Panel A, (iv)	Yes, as in Table 4, Panel A, (iv)	Yes, as in Table 5, Panel A, (iv)	Yes, as in Table 5, Panel A, (iv)
Adjusted <i>R</i> ²	0.0626	0.1021	0.1241	0.2212	0.2695
No. of observations	4,700	2,342	3,009	1,166	578

This table presents the coefficients from regression models using *I_INDEX* as an alternative measure of financial reporting quality. *I_INDEX* is the average of the decile ranks of several variables that proxy for the target firm's financial reporting quality. A higher value indicates higher financial reporting quality. In Model (i), the dependent variable in the Probit regression is *NON_NEGO*, which equals 1 if the takeover is non-negotiated and 0 otherwise. The control variables in this regression are the same as in Model (ii) of Panel A in Table 3. Models (ii) and (iii) present OLS regression coefficients with *SDC* or *Schwert premium* as the dependent variable. The control variables in these regressions are the same as in Model (iv) of Panel B in Table 4. In Models (iv) and (v), the dependent variable in the Tobit regressions is *PCT_EQUITY*, the percentage of proceeds paid with equity. Model (iv) includes all public bidders, whereas Model (v) includes only observations in which the target's market capitalization is at least 15 % of the bidder's market capitalization. Standard errors (in parentheses) are White (1980) heteroskedasticity-adjusted and robust to within-firm correlation (Rogers (1993)/clustered standard errors). ***, **, * indicate that the parameter estimate is significantly different from zero at the 1 %, 5 %, or 15 % level, respectively. §§ indicates that the coefficients differ across the *Negotiated* and *Non-negotiated* takeovers at the 5 % significance level

Untabulated results from this analysis reveal that our earlier conclusions on the relation between earnings quality and bidders' decisions are robust to controlling for corporate governance and managerial ownership. Thus our earlier results are not driven by earnings quality proxying for either corporate governance or managerial ownership structure.

7 Conclusion

Financial information is central to corporate decision-making. Given the prominence of acquisitions as investment decisions, we investigate how the quality of

Footnote 32 continued

directors, and (iii) whether the positions of CEO and board chairman are held by separate individuals. The data on board characteristics are obtained from the IRRC database, which covers firms belonging to the S&P 500, S&P 400 mid-cap, and S&P 600 small-cap indices, beginning in 1997. The data on managerial ownership are obtained from S&P Execucomp, which covers firms in the S&P 500, S&P 400 mid-cap, and S&P 600 small-cap from 1992 onwards. The data availability on S&P Execucomp limits the sample size for this analysis.

information in target firms' earnings affects acquisition decisions by bidding firms. We differentiate between the symmetric and asymmetric components of financial reporting quality and hypothesize that bidders are more likely to choose negotiated takeovers, offer larger bid premiums in negotiated transactions, and use shares as method of payment when the asymmetric component is large. Conversely, we predict no clear relation between these takeover decisions and the symmetric uncertainty component.

Using a large sample of US takeovers between 1977 and 2005, we find evidence consistent with our predictions: bidders are more likely to undertake negotiated takeovers when asymmetric uncertainty is potentially an important concern; in negotiated deals, the asymmetric components of earnings quality and takeover premiums are negatively related, suggesting that bidders obtain valuable private information through negotiations. Finally, the propensity to use equity as a method of payment is higher if the target firm's earnings quality is poor, which is consistent with bidders attempting to share the information risks associated with such targets.

Overall, our findings suggest that acquiring firms take into consideration the quality of target firms' earnings in making strategic investment decisions. In a broader context, while earnings quality has been shown to affect the pricing of financial securities in general, the evidence in this study suggests that earnings quality also affects critical corporate decisions. Our study also shows that decomposition of earnings quality into asymmetric uncertainty and symmetric uncertainty components, as suggested by Rogo (2009), could be a fruitful approach to obtain a deeper understanding of the effect of earnings quality on managerial decisions.

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Appendix

See Table 9.

Table 9 Variable definitions

<i>EQ</i>	Negative of the standard deviation of accrual residuals in years $t - 5$ to $t - 1$, where year t is the fiscal year ending at least 30 days prior to the acquisition announcement. The accrual residuals for a sample firm in a given year are obtained from industry-level regressions of the accrual model given in McNichols (2002)
<i>NON-NEGO</i>	Equals 1 if takeover contest is classified as hostile or unsolicited by SDC and 0 otherwise
<i>PILL</i>	Equals 1 if the target firm is reported by SDC to have a poison pill in place during the contest and 0 otherwise

Table 9 continued

<i>AUCTION</i>	Equals 1 if the number of bidders reported by SDC is more than one and 0 otherwise
<i>TENDER</i>	Equals 1 if the deal is classified as a tender offer by SDC and 0 otherwise
<i>CASH</i>	Equals 1 if the deal is paid for using cash only and 0 otherwise
<i>EQUITY</i>	Equals 1 if the deal is paid for using stock only and 0 otherwise
<i>PCT_EQUITY</i>	Percentage of the takeover proceeds paid using equity
<i>ROE</i>	Ratio of earnings to average equity: $\text{data item } 20(t)/\{[\text{data}60(t) + \text{data}60(t - 1)]/2\}$
<i>SGROW</i>	Percentage change in sales: $\text{Ln}(\text{data item } 12(t)/\text{data}12(t - 1))$
<i>LIQ</i>	Ratio of net liquid assets to total assets: $(\text{data}4 - \text{data}5)/\text{data}6$
<i>DERATIO</i>	Ratio of debt to equity: $\text{data}9/\text{data}60$
<i>MBRATIO</i>	Ratio of market value of equity to book value of equity: $\text{data}24 \times \text{data}25/\text{data}60$
<i>PERATIO</i>	$\text{Data}24/\text{data}58$
<i>SIZE</i>	Log of <i>MARKETCAP</i> , the market capitalization from CRSP on day -60 relative to announcement date
<i>PUBLIC</i>	A bidder is classified as public if it is identified as a public company by SDC; otherwise it is classified as private
<i>SDC premium</i>	Market model cumulative abnormal return over event day -63 to event day 0, where event day 0 is the acquisition announcement date. The stock return on event day 0 is computed from the SDC reported offer price and the closing stock price on day -1 . The abnormal returns are obtained from a market model with the CRSP value-weighted index return as the market return. The parameters of the model are estimated over the period day -316 to day -64
<i>Schwert premium</i>	Market model cumulative abnormal return for the $[-63, 126]$ window relative to the acquisition announcement date (day 0), with $[-316, -64]$ as the estimation window, and the CRSP value-weighted index return as the market return
<i>I_INDEX</i>	The average of the decile ranks of variables that proxy for the target firm's operating volatility and financial reporting quality. A higher decile rank indicates higher information quality. The operating volatility variables are (i) volatility of cash flows, (ii) volatility of stock returns, (iii) volatility of net income, and (iv) volatility of sales. These volatility variables are measured as the standard deviation of the underlying annual variable over a 5-year period prior to the acquisition announcement date. The financial reporting quality variables are (i) accruals quality, (ii) timely gain recognition measure, (iii) timely loss recognition measure, (iv) an indicator for Big 5 auditor, (v) number of business segments, (vi) number of geographical segments, and (vii) proportion of years with losses in the prior 5-year period

All accounting variables are as of the latest fiscal year ending at least 90 days before the acquisition announcement date

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