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Target Accounting Quality and Merger Consideration Design

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TARGET ACCOUNTING QUALITY AND MERGER CONSIDERATION DESIGN

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Dedication

This dissertation is dedicated to my best friend and beloved fiancée, Xinyue Zhang, for her unconditional support and encouragement over the years.

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by

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Abstract

This study examines how accounting quality of target firms relates to the design of merger consideration in acquisition agreements. Prior literature suggests that acquirers mitigate adverse selection problems by making the value of merger consideration sensitive to the acquirers' merger announcement returns. Using a large sample of acquisition agreements of public merging parties between 1996 and 2017, I investigate whether high-quality accounting information of target firms helps acquirers mitigate adverse selection problems and in turn affects the sensitivity of merger consideration to the acquirers' merger announcement returns. I hypothesize and find that accounting quality of target firms is negatively related to the sensitivity of merger consideration to the acquirers' merger announcement returns. Additionally, this relation is more pronounced when acquirers have greater incentives to resolve adverse selection problems and less pronounced when acquirers can collect more information about targets from other sources. Collectively, my evidence suggests that high-quality accounting information of target firms helps acquirers resolve adverse selection problems and affects the design of merger consideration.

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1. Introduction

High-quality accounting information plays an important role in reducing information uncertainty in merger and acquisition (M&A) transactions. While prior literature mainly focuses on the impact of accounting quality on ex-post consequences of M&A transactions (Raman et al., 2013; Skaife and Wangerin, 2013; McNichols and Stubben, 2015; Marquardt and Zur, 2015), this study examines the role of accounting quality in the design of acquisition agreements.[1] More specifically, I investigate whether target firms' accounting quality is associated with the merger consideration design in acquisition agreements.

In an acquisition transaction, the acquirer pays merger consideration in exchange for the intrinsic value of the target and a portion of expected synergies (McNichols and Stubben, 2015). The underlying value of the merger is difficult to determine a priori because the acquirer has limited information about the target. Before the underlying value of the merger is determined, adverse selection problems arise as target firms have the incentive to withhold negative private information and are unable to credibly disclose positive private information (Chen et al., 2018). Prior literature suggests that acquirers can mitigate adverse selection problems by making the value of merger consideration sensitive to the acquirers' merger announcement returns (Hansen, 1987; Houston and Ryngaert, 1997).[2]

An acquirer's merger announcement returns reflect market participants' assessment of underlying value of the proposed acquisition. Some market participants may have private information about the target that only becomes relevant after the merger announcement. By exposing the value of merger consideration to the acquirers' merger announcement returns,

[1] Accounting quality is defined as decision usefulness in the context of equity valuation (Dechow et al., 2010).

[2] In this study, the acquirers' merger announcement returns are defined as the acquirers' market returns between merger announcement date and merger completion date.

acquirers rely on the contingent-pricing effect of the stock to help determine the amount of merger consideration, and thus are able to resolve adverse selection problems (Hansen, 1987). By accepting merger consideration that is sensitive to the acquirers' merger announcement returns, targets signal that they have no negative private information to withhold, and information they have disclosed is credible. Thus, acquirers are more likely to offer a consideration that is sensitive to the acquirers' merger announcement returns when they have more concerns about adverse selection problems.

Although acquirers know the market value of public targets, uncertainty and disagreement exist regarding intrinsic value of the target and expected synergies from the acquisition.[3] Higher-quality accounting information reduces information uncertainty about targets, helps acquirers more precisely value targets and identify potential synergies from the acquisition, and thereby mitigates adverse selection problems (Raman et al., 2013; Skaife and Wangerin, 2013; McNichols and Stubben, 2015).[4] Therefore, I predict that acquirers offer a merger consideration that is less sensitive to the acquirers' merger announcement returns when targets' accounting quality is higher.

I test my predictions using a sample of 1,390 acquisition agreements of publicly listed firms between 1996 and 2017. I use multiple measures of accounting quality. The first is based on the model of accruals quality that is developed by Dechow and Dichev (2002) and augmented by McNichols (2002). The second is based on how well cash flows from operations and working capital predict future cash flows from operations (McNichols and Stubben, 2015). I measure bid

[3] According to McNichols and Stubben (2015), the intrinsic value of the target and expected synergies from the acquisition vary across target/acquirer pairs.

[4] I note that targets' accounting quality may have no impact on bid elasticity for two reasons. First, acquirers may rely on forwarding-looking information other than accounting information in financial statements to value targets, as investors should "make financial decisions based on expectations about the future rather than knowledge about the past" (Bruner, 2004, page 255). Second, acquirers may rely on private information in addition to accounting information to resolve adverse selection problems (Raman et al., 2013).

elasticity as the percentage change in value of the targets' total compensation to a one percent change in the acquirers' merger announcement returns (Officer, 2004). After controlling for target characteristics, including information asymmetry about targets, acquirer characteristics, and deal characteristics, I find that acquirers offer merger consideration that is less sensitive to the acquirers' merger announcement returns when targets' accounting quality is higher, which is consistent with my prediction. This finding, which is robust to all my measures of targets' accounting quality and alternative measures of information asymmetry about targets, indicates that high-quality accounting information plays an important role in the design of acquisition contracts.

I also examine two factors that may affect the relation between targets' accounting quality and bid elasticity. First, the relation between targets' accounting quality and bid elasticity may be stronger when acquirers have a greater incentive to resolve adverse selection problems. The acquirer has a greater incentive to resolve adverse selection problems when the target is larger relative to the acquirer, since overpayment caused by adverse selection problems is likely to have a greater economic impact on the acquirer (Houston and Ryngaert, 1997). I predict and find that the relation between targets' accounting quality and bid elasticity is stronger when the target is larger relative to the acquirer.

Second, although high-quality information from financial reports plays an important role in reducing information uncertainty, financial reports are not the only source of information about the target. High-quality accounting information becomes less important to reduce information uncertainty when acquirers can collect more information from other channels. Stock analysts collect, analyze, and distribute information about firms. Therefore, I predict and find that the relation between targets' accounting quality and bid elasticity is weaker when targets have a greater analyst following.

Taken together, findings in this paper suggest that higher-quality accounting information reduces information uncertainty about targets, helps acquirers mitigate adverse selection problems, and in turn reduces bid elasticity. In addition, the relation between targets' accounting quality and bid elasticity is stronger when acquirers have a greater incentive to resolve adverse selection problems and is weaker when acquirers can collect more information about targets from other sources.

This paper makes several contributions to the literature. First, it contributes to the literature on the role accounting information plays in determining target firms' merger consideration. While prior literature focuses on how targets' accounting quality affects acquisition premium and merger announcement returns of both the acquirer and the target (Skaife and Wangerin, 2013; McNichols and Stubben, 2015), I examine how targets' accounting quality affects the design of merger consideration prior to the merger announcement. Second, this paper contributes to the literature on determinants of bid elasticity (Houston and Ryngaert, 1997; Officer, 2004). Given the significant economic impact of exposing merger consideration to acquirers' merger announcement returns, it is important for both practitioners and researchers to understand what factors influence the bid elasticity. Findings in this paper provide evidence that targets' accounting quality is a crucial determinant of the bid elasticity. Finally, this study contributes to the literature on the role of M&A contractual features in mitigating adverse selection problems (Datar et al., 2001; Cadman et al., 2014; Macias and Moeller, 2016). This paper provides evidence that acquirers use merger consideration that is sensitive to the acquirers' merger announcement returns to mitigate adverse selection problems.

The rest of the paper is organized as follows. In the next section, I discuss the related literature and hypothesis development. Section 3 describes the research method, including the

measures of merger consideration design and target accounting quality respectively, and research design. Section 4 describes sample selection and descriptive statistics. Empirical results and robustness tests are reported in Section 5. This study concludes in Section 6.

2. Related Literature and Hypothesis Development

2.1. Adverse Selection Problem and M&A Contractual Mechanisms

Adverse selection problems arise in acquisition transactions because the target has the incentive to withhold negative private information and is unable to credibly disclose positive private information. Prior literature provides evidence that acquirers use contractual mechanisms to mitigate adverse selection problems. Datar et al. (2001) and Cadman et al. (2014) find that earnouts are more likely to be used when targets have greater private information. Macias and Moeller (2016) provide evidence that targets signal their higher value by accepting MAC clauses with fewer exclusions. In his theoretical work, Hansen (1987) suggests that acquirers might offer stock as a payment method to mitigate the adverse selection problem. He argues that stock's contingent-pricing feature forces targets to share risks of overpayment after the completion of the deal.

Merger consideration can be designed to make the value of the targets' compensation sensitive to the acquirers' merger announcement returns. The merger consideration that is sensitive to the acquirers' merger announcement returns helps acquirers resolve adverse selection problems about the targets' compensation. Before the underlying value of the merger is determined, targets may withhold negative private information and may be unable to credibly disclose positive private information. An acquirer's merger announcement returns reflect market participants' assessment of underlying value of the proposed acquisition. Some market participants, including stock analysts, institutional investors, auditors, creditors, and suppliers of targets, may have private information about targets that is not known by acquirers. Such private information will only become relevant after the merger announcement and will be reflected in the acquirers' merger announcement returns. Because targets believe such private information will be reflected in

acquirers' merger announcement returns, by accepting the merger consideration that is sensitive to the acquirers' merger announcement returns, targets signal that they have no negative private information to withhold and information they have disclosed is credible. As a result, the merger consideration that is sensitive to the acquirers' merger announcement returns helps acquirers resolve adverse selection problems about the targets' compensation.

Focusing on the sensitivity of targets' total compensation to the acquirers' merger announcement returns, Houston and Ryngaert (1997) find that the sensitivity of targets' total compensation to the acquirers' merger announcement returns increases when the target is larger relative to the acquirer, which suggests that acquirers use high-elasticity bids to resolve adverse selection problems.

2.2. TARGET ACCOUNTING QUALITY AND ADVERSE SELECTION PROBLEM

Prior to the signing of acquisition agreements, acquirers value their potential targets based on publicly available information and a limited amount of private information (Skaife and Wangerin, 2013; Chen et al., 2018; Wangerin, 2019). During preliminary due diligence, acquirers can obtain public information about potential targets from publicly available financial statements disclosed in the U.S. Securities and Exchange Commission (SEC) filings or on company websites, articles in the business press, and analyst or industry reports (Skaife and Wangerin, 2013). Among all the publicly available information that acquirers obtain during preliminary due diligence, information from financial reports plays a main role in target valuation (Lajoux and Elson, 2010).

After the completion of preliminary due diligence, the target and the acquirer sign a confidentiality agreement to enter into an in-depth due diligence phase. In this phase, the acquirer has access to private information from the target. However, the usefulness of private information from targets in target valuation is limited. Since the acquisition price is not determined, the target

has incentives to only disclose positive private information, which makes such private information less credible (Chen et al., 2018).

The evidence provided by prior literature is consistent with target firms' high-quality accounting information reducing information uncertainty and helping acquirers mitigate adverse selection problems. Skaife and Wangerin (2013) find that acquirers pay lower premiums for targets with high-quality financial reporting and deals involving targets with high-quality financial reporting are less likely to be renegotiated or terminated. In a recent empirical study, McNichols and Stubben (2015) find that when a company acquires a target with higher accounting quality, the acquirer experiences higher announcement returns while the target experiences lower announcement returns. The authors' findings indicate that high-quality accounting information of target firms helps acquirers reduce information uncertainty in valuing targets and thus make more profitable acquisitions. Rather than examining how targets' accounting quality affects ex-post consequences of M&A transactions, this paper focuses on the effect of targets' accounting quality on the design of merger consideration in acquisition agreements.

2.3. HYPOTHESES

Exposing merger consideration to acquirers' merger announcement returns can help acquirers resolve adverse selection problems. Despite the benefits of resolving adverse selection problems, making merger consideration sensitive to the acquirers' merger announcement returns can be costly. The costs include not only time and effort to negotiate the contractual terms of bid elasticity, but also costs of making targets bear additional risk. Therefore, I expect acquirers increase the sensitivity of merger consideration to the acquirers' merger announcement returns only when they believe the benefits of resolving adverse selection problems outweigh the costs.

The benefits of resolving adverse selection problems increase with adverse selection risks. High-quality accounting information reduces information uncertainty and helps acquirers value targets more precisely and identify potential synergies, which in turn mitigates adverse selection risks. Therefore, I predict that acquirers use merger consideration that is less sensitive to the acquirers' merger announcement returns when targets' accounting quality is higher. This leads to my first hypothesis:

Hypothesis 1: The sensitivity of targets' total compensation to acquirers' merger announcement returns is negatively associated with targets' accounting quality.

Adverse selection risks of acquirers increase with information uncertainty of targets, as high information uncertainty about targets makes it more difficult for acquirers to value targets and identify synergy. If high-quality accounting information helps acquirers reduce information uncertainty about targets, then acquirers may rely more on targets' high-quality accounting information in reducing information uncertainty when they have greater incentives to resolve adverse selection problems. Therefore, I expect that the relation between targets' accounting quality and bid elasticity is more pronounced when acquirers face greater incentives to resolve adverse selection problems. These arguments lead to my following hypothesis:

Hypothesis 2: The effect of targets' accounting quality on the sensitivity of targets' total compensation to the acquirers' merger announcement returns is more pronounced when acquirers have greater incentives to resolve adverse selection problems.

Although high-quality information from financial reports plays an important role in reducing information uncertainty, financial reports are not the only source that acquirers can use for information. High-quality accounting information becomes less important to reduce information uncertainty when acquirers can collect more information from other channels. Prior literature suggests that acquirers obtain information about targets from third-party sources (Ivashina et al., 2009; Agrawal et al., 2013; Dhaliwal et al., 2016). Thus, I predict that the relation between targets' accounting quality and bid elasticity is less pronounced when acquirers can collect more information about targets from other sources. This leads to my third hypothesis:

Hypothesis 3: The effect of targets' accounting quality on the sensitivity of targets' total compensation to the acquirers' merger announcement returns is less pronounced when acquirers can obtain more information about targets from other channels.

3. Research Method

3.1. MERGER CONSIDERATION DESIGN

Merger consideration can be made in cash, stock, or a combination of the two. Cash is not sensitive to the acquirers' merger announcement returns while stock may be. Some acquirers offer stock consideration that is sensitive to the acquirers' merger announcement returns by offering a fixed-ratio stock offer, which offers the target a fixed number of securities; a floating-ratio collar offer, which offers the target a fixed dollar value as long as the acquirer's stock price is in the prespecified range, and a fixed number of securities if the acquirer's stock price is out of the range; or a fixed-ratio collar offer, which offers the target a fixed number of securities when the acquirer's stock price is in the prespecified range, and a fixed dollar value if the acquirer's stock price is out of the range. In contrast, other acquirers offer stock consideration that is not sensitive to the acquirers' merger announcement returns by offering a floating-ratio stock offer, which offers the target a fixed dollar value.[5]

The variation described above makes some types of stock consideration more sensitive to the acquirers' merger announcement than other types. Following Officer (2004), I measure bid elasticity (*Elast*) as the percentage change in value of the targets' total compensation to a one percent change in the acquirers' merger announcement returns.[6]

As Officer (2004) mainly examines the determinants of the inclusion of collars in merger bids, both collar and non-collar stock offers in his study are considered sensitive to the acquirers' merger announcement returns. In this paper, I further categorize non-collar stock offers into fixed-ratio and floating-ratio stock offers. Based on the categorization, the bid elasticity of a fixed-ratio

[5] See **Appendix B** for examples of each type of stock consideration.

[6] See **Appendix C** for the computation of bid elasticity.

stock offer equals 1 while the bid elasticity of a floating-ratio stock offer equals 0. A floating-ratio collar offer is usually more sensitive to the acquirers' merger announcement returns than a fixed-ratio collar offer, and the sensitivity of both collar offers are between 0 and 1. For any type of stock offer with cash component, I first assume that the target's total compensation is offered in stock, and then I calculate bid elasticity as the percentage of stock offered in the merger consideration multiplied by the sensitivity of targets' total compensation to a one percent change in the acquirers' merger announcement returns.

3.2. TARGET ACCOUNTING QUALITY

I use two approaches to measure the accounting quality of target firms. The first approach is based on Dechow and Dichev's (2002) model of accruals quality. Dechow and Dichev's (2002) model captures the extent to which working capital accruals map into past, present, and future cash flows from operations. As suggested by McNichols (2002), I add the change in revenue and the level of gross property, plant, and equipment to Dechow and Dichev's model as explanatory variables. In Dechow and Dichev's model, the weaker the mapping of working capital accruals into cash flows from operations, the poorer the quality of reported working capital accruals.

The second approach captures the extent to which cash flows from operations and working capital accruals predict future cash flows from operations (McNichols and Stubben, 2015). The lower ability of cash flows from operations and working capital accruals explaining future cash flows from operations indicates the poorer quality of cash flows from operations and working capital accruals that are reported. Using ordinary least squares regression, I estimate the following models for each of Fama and French's (1997) 48 industry groups with at least 20 observations in year *t*-1:

$$WCA_{i,t-1} = \beta_0 + \beta_1 OCF_{i,t-2} + \beta_2 OCF_{i,t-1} + \beta_3 OCF_{i,t} + \beta_4 \Delta SALE_{i,t-1} + \beta_5 PPE_{i,t-1} + \epsilon_{i,t-1}, \quad (1)$$

$$OCF_{i,t} = \gamma_0 + \gamma_1 OCF_{i,t-1} + \gamma_2 WCA_{i,t-1} + \epsilon_{i,t}, \quad (2)$$

where *WCA* is working capital accruals, calculated as net income before extraordinary items, plus depreciation and amortization, minus cash flow from operations; *OCF* is the cash flow from operations; Δ*SALE* is the change in sales relative to previous year; and *PPE* is the gross property, plant, and equipment. All variables are scaled by average total assets, and winsorized at the 1st and 99th percentiles each year.

The annual cross-sectional estimation of Eq. (1) and Eq. (2) yields firm- and year-specific residuals. *AQ1* is measures as the product of -1 and the standard deviation of firm *i*'s residuals from Eq. (1) over year *t*-6 through *t*-2. *AQ2* is measured similarly using firm *i*'s residuals from Eq. (2). Accounting quality (*AQ*) for firm *i* in year *t*-1 is measured as the mean of *AQ1* and *AQ2*. A higher value of *AQ* indicates higher accounting quality. I use lagged *AQ1* and *AQ2* to account for the fact that both Eq. (1) and Eq. (2) include the cash flow from operations in year *t*. Meanwhile, using lagged *AQ1* and *AQ2* mitigates concerns that the measure of accounting quality may be affected by managerial manipulation prior to the acquisition. Because the measure of accounting quality needs five years of residuals, many young firms are likely to be excluded. To mitigate selection bias, I require firms in my sample to have a minimum three years of residuals to calculate accounting quality.

3.3. EMPIRICAL DESIGN

As bid elasticity is censored to be between 0 and 100%, I employ the double-sided Tobit regression to test the relation between target firms' accounting quality and bid elasticity in acquisition agreements:

$$Elast_{i,t} = \beta_0 + \beta_1 AccQuality_{i,t-1} + \beta_2 NonSyn_{i,t-1} + \beta_3 Age_{i,t-1} + \beta_4 MtB_{i,t-1} +$$
$$\beta_5 AnalystCover_{i,t-2} + \beta_6 Size_{i,t-1} + \beta_7 AcqDE_{m,t-1} + \beta_8 AcqMtB_{m,t-1} + \beta_9 AcqSize_{m,t-1} +$$
$$\beta_{10} Comp_{l,t} + \beta_{11} Earnout_{l,t} + \beta_{12} RelLarge_{l,t-1} + \beta_{13} RetCor_{l,t-1} + \beta_{14} SameInd_{l,t-1} +$$
$$\beta_{15} Toehold_{l,t} + \Sigma_n \beta_n Year_n + \epsilon_{i,t}, \quad (3)$$

where the dependent variable, *Elast*, is the sensitivity of the targets' total compensation to the acquirers' merger announcement returns. The variable of interest, *AccQuality*, is one of the three measures of targets' accounting quality defined in Section 3.1. Based on my *Hypothesis 1*, I expect a negative relation between *Elast* and *AccQuality*.

I also include characteristics of targets, acquirers, and deals that are shown by prior literature to explain the bid elasticity, with all variables defined in Table A1. With respect to target characteristics, I proxy for information asymmetry about targets using targets' stock return nonsynchronicity (*NonSyn*) (Martin and Shalev, 2017), as Houston and Ryngaert (1997) suggests that information asymmetry about targets is associated with bid elasticity. I also proxy for inherent uncertainty of targets using targets' age (*Age*) (Zhang, 2006). I proxy for targets' growth opportunity using targets' market-to-book ratio (*MtB*), as Officer (2004) argues that bid elasticity increases in the target's market-to-book ratio. Finally, I proxy for the amount of information about targets that acquirers can obtain from other sources using targets' analyst following (*AnalystCover*) and for targets' size using targets' market value of equity (*Size*).

With respect to acquirer characteristics, I include acquirers' debt-to-equity ratio (*AcqDE*) as a proxy for acquirers' financing availability. Officer (2004) argues that bid elasticity may increase in acquirers' market-to-book ratio as acquirers are more likely to pay with stock when stock is overvalued, I include acquirers' market-to-book ratio (*AcqMtB*) as a proxy for the

misvaluation of acquirers' securities. I also include acquirers' market value of equity (*AcqSize*) to control for the effect of acquirers' size on bid elasticity.

Houston and Ryngaert (1997) find that bid elasticity decreases when the acquirer faces competition in the acquisition and increases in the correlation of bidder and target stock returns. I proxy for bid competition using the indicator for whether more than one bidder bid for the target within a 1-year window centered on the merger announcement date (*Comp*). I also proxy for the similarity in merging parties' economic environments using the correlation of the target and the acquirer weekly stock returns (*RetCor*) and the indicator for whether the target and the acquirer are in the same Fama-French 12 industry groups prior to the merger announcement date (*SameInd*). Bid elasticity may increase when acquirers have greater incentives to resolve adverse selection problems. I proxy for acquirers' incentives to mitigate adverse selection problems using the indicator whether the ratio of market capitalization of the target to the combined market capitalization of the acquirer and the target is greater than 5% (*RelLarge*). I control for whether the acquirer owns stock of the target at the merger announcement date (*Toehold*), as bid elasticity may decrease when the acquirer already has considerable knowledge of the target. Finally, I control for whether the deal includes an earnout (*Earnout*). The calendar year dummies are also included in the model and standard errors are clustered by target firms.

My second hypothesis predicts that the effect of targets' accounting quality on bid elasticity is stronger when acquirers have greater incentives to mitigate adverse selection problems. To test *Hypothesis 2*, I add an interaction between *AQ* and *RelLarge* to Eq. (3). I use *RelLarge* as a proxy for acquirers' incentives to mitigate adverse selection problems. Overpayment caused by adverse selection problems is likely to have more economic impacts on acquirers when targets are larger

relative to acquirers (Houston and Ryngaert, 1997). Based on *Hypothesis 2*, I expect a negative relation between *Elast* and the interaction between *AQ* and *RelLarge*.

My third hypothesis predicts that the effect of targets' accounting quality on bid elasticity is weaker when acquirers can obtain information about targets from other sources. To test *Hypothesis 3*, I include the interaction between *AQ* and *AnalystCover* in Eq. (3). I use *AnalystCover* as a proxy for the amount of information that acquirers can obtain from other sources. Based on *Hypothesis 3*, I expect a positive relation between *Elast* and the interaction between *AQ* and *AnalystCover*.

4. Sample and Descriptive Statistics

4.1. SAMPLE SELECTION

Table 1, Panel A describes the sample selection procedure. A sample of domestic mergers and acquisitions with announcement dates between 1996 and 2017 is obtained from the Security Data Company (SDC) U.S. Mergers and Acquisitions database. The sample period starts in 1996 because I need specific details of contractual terms of merger consideration from acquisition agreements in the SEC filings available in the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system, which starts to cover most acquisition agreements in 1996.[7] I limit the sample to bids on public targets that are made by public acquirers because I require financial statements and stock price data for both acquirers and targets. In addition, acquirers must own less than 50% of the target before the transaction and seek to own more than 50% of the target after the deal is completed. Hostile or unsolicited deals and deals with status of "Rumor", "Dis Rumor", or "Status Unknown" are excluded because there are no acquisition agreements in these deals (Denis and Macias, 2013). To ensure the transaction I examine is material and has a clear acquirer, I eliminate the acquisition if the total assets of the target constitute less than 1 percent or more than 45 percent of the combined total assets of the two firms (Houston and Ryngaert, 1997).[8] Applying these filters gives me 4,246 deals from the SDC database. Next, I eliminate deals if either targets or acquirers cannot be located in Compustat and CRSP databases, this process leaves me a sample of 3,153 deals for acquisition agreements collection.

In order to obtain specific details of contractual terms of merger consideration, I first find the initial acquisition agreement from the EDGAR database. For each deal in my sample, I use

[7] As of May 6, 1996, all U.S. public traded firms were required to file their forms to the EDGAR (https://www.sec.gov/edgar/aboutedgar.htm).

[8] It is unclear which firm is the acquirer in "Merger of equals" (Houston and Ryngaert, 1997).

Python code to scan the acquirers' SEC filings that are filed within one year of the merger announcement date in the EDGAR database.[9] For deals in which acquisition agreements cannot be found in the acquirer's SEC filings, I use the same text-search algorithm to scan the target's filings. This process helps me find initial acquisition agreements for 2,946 out of 3,153 deals.[10] Because I require Compustat and CRSP data of both targets and acquirers to construct measures of bid elasticity, targets' accounting quality, and control variables in the main tests, 1,556 deals are excluded due to missing values. Thus, my sample consists of 1,390 U.S. acquisitions between publicly listed targets and acquirers in the 1996-2017 period.[11]

4.2. DESCRIPTIVE STATISTICS

Table 1, Panel B reports the descriptive statistics of bid elasticity by targets' Fama-French 12 industry group. This table indicates that industries are broadly represented in the sample, with the oil, gas, and coal extraction and products industry accounting for the highest bid elasticity (0.64).[12] Figure 1 depicts sample distribution by announcement year. The solid line represents the full sample and the dashed line represents the subsample of deals with bid elasticity that is greater than zero. For the acquisition activity in the full sample, beginning in 1996, the number of acquisitions increases until it reaches a peak in 1998 and decreases significantly after the market

[9] The SEC filings include 8-K, 10-Q, 10-K, 6-K, 425, S4, PREM14, DEF 14A, SC 13D, and SC 14D files. For each filing form, I search for the following 12 terms (in capital letters): "acquisition agreement", "affiliation agreement", "agreement and plan of merger", "agreement and plan of merger and reorganization", "agreement and plan of reorganization", "agreement of merger", "agreement of reorganization and merger", "asset purchase agreement", "reorganization agreement", "reorganization and merger agreement", "share purchase agreement", and "stock purchase agreement". If one of 12 initial search terms is found, I then search for the following 3 terms (in capital letters) within 10,000 characters after the initial search term: "table of contents", "article i", and "article 1".

[10] For the other 207 acquisitions whose initial merger agreements are unavailable, the deal status of 89 of them is "Withdrawn", 7 of them are "Pending", and 111 of them are "Completed".

[11] I require at least five year of data to construct measures of accounting quality. Many young target firms are excluded due to lack of financial statement data, resulting in a significant reduction in the sample size.

[12] In untabulated analyses, results in this study are robust to the exclusion of target firms in financial and utility industries.

crash in 2000. It starts to increase again after 2002 until the financial crisis in 2008. In general, the overall trend of acquisition activity in the full sample is consistent with that reported in prior literature (McNichols and Stubben, 2015; Martin and Shalev, 2017). Further, the overall trend of acquisition activity in the subsample of deals with bid elasticity that is greater than zero is consistent with that in the full sample.

Table 2 shows descriptive statistics of bid elasticity based on the type of merger consideration. In the sample, 45.11% of acquisitions are financed by pure cash, 33.46% of acquisitions are financed by pure stock, and 21.43% of acquisitions are financed by a combination of the two. I categorize the merger considerations into two groups based on whether it is sensitive to the acquirers' merger announcement returns. 51.07% of acquisitions are financed by merger considerations that are sensitive to the acquirers' merger announcement returns, and 48.93% of acquisitions are financed by merger considerations that are not. The group that is sensitive to the acquirers' merger announcement returns consists of plain fixed-ratio stock offers, fixed-ratio stock offers with cash components, plain fixed-ratio collar offers, fixed-ratio collar offers with cash components, plain floating-ratio collar offers, and floating-ratio collar offers with cash components. The group that is not sensitive to the acquirer's merger announcement returns consists of plain cash offers, plain floating-ratio stock offers, and floating-ratio stock offers with cash components. For merger considerations that are sensitive to the acquirers' merger announcement returns, plain fixed-ratio stock offers have the highest bid elasticity on average (1.00) while fixed-ratio collar offers with cash components have the lowest bid elasticity on average (0.13). The average bid elasticity of all merger considerations is 0.37, which means that for an average

acquisition in my sample, a 1% decrease in the acquirers' merger announcement returns will lead to a decrease of $10,419,498 in the targets' total compensation.[13]

Table 3 provides descriptive statistics for measures of bid elasticity, targets' accounting quality, target characteristics, acquirer characteristics, and deal characteristics for the sample. All continuous variables are winsorized at 1% and 99% levels to exclude effects of outliers. The mean value of *AQ* is -0.088, which is comparable to the -0.08 reported by McNichols and Stubben (2015). A higher value of *AQ* indicates a higher quality of targets' accounting information. The mean value of *AQ1* is -0.092 and the mean value of *AQ2* is -0.085. The average age of target firms (*Age*) is 20 years and the average number of analysts following target firms (*AnalystCover*) is 7.[14] The mean value of target stock-return nonsynchronicity (*NonSyn*) is 1.447, which is smaller than the 1.863 reported by Martin and Shalev (2017). A higher value of *NonSyn* indicates a lower information asymmetry about target firms. The mean value of targets' market-to-book ratio (*MtB*) is 3.454 while the mean value of acquirers' market-to-book ratio (*AcqMtB*) is 3.757, which suggests acquirers in my sample on average have more growth opportunities than targets do. The mean value of the natural logarithm of targets' market value of equity (*Size*) is 19.744 while the mean value of the natural logarithm of acquirers' market value of equity (*AcqSize*) is 21.758, which shows that acquirers are bigger on average than targets in terms of market size in my sample.

For deal characteristics, 3.7% of the acquisitions involve a target that receives bids from more than one bidder within a 1-year window centered on the merger announcement date (*Comp*). 0.4% of the acquisitions include an earnout (*Earnout*) and 74.1% of the acquisitions involve a

[13] In my sample, the average length of the period between merger announcement and completion is around 95 trading days. On the 95th trading day after the merger announcement, the mean of absolute value of acquirers' cumulative returns is 21%, while the mean of absolute value of corresponding value weighted market returns is 8%.

[14] The descriptive statistics of *Age* and *AnalystCover* that are reported in Table 3 are based on natural logarithm values of both variables.

target whose market capitalization is at least 5% of the combined market capitalization of the acquirer and the target (*RelLarge*). The average correlation of the target's and the acquirer's weekly stock returns (*RetCor*) is 0.276, and 60.9% of the acquisitions involve a target and acquirer that are in the same industry (*SameInd*). Finally, 3.3% of the acquisitions involve an acquirer that owns stock of the target at the merger announcement (*Toehold*).

Table 4 reports pairwise correlations among regression variables. *Elast* is negatively correlated with all the measures of targets' accounting quality. However, only the correlation between *Elast* and *AQ2* is statistically significant at 10%. These univariate results support *Hypothesis 1*. *Elast* is significantly negatively correlated with *NonSyn*, which indicates that bid elasticity is lower when there is more information available about targets. *Elast* is significantly positively correlated with *RelLarge* and *RetCor* respectively, which is consistent with Houston and Ryngaert (1997).

5. Empirical Results

5.1. Target Accounting Quality and Bid Elasticity

Table 5 presents the results from estimating Eq. (3) using double-sided Tobit regression. In column 1, the estimated coefficient on *AQ1* (β_1=-1.899, p<0.01) is significantly negative, which is consistent with my *Hypothesis 1* that the sensitivity of the targets' total compensation to the acquirers' merger announcement returns is negatively associated with the accounting quality of target firms. The relation between *Elast* and *NonSyn* is significantly negative (β_2=-0.156, p<0.05), indicating that bid elasticity is lower when there is more information available about target firms. The estimated coefficient on *RelLarge* (β_{12}=0.427, p<0.01) is significantly positive, which suggests that acquirers increase the sensitivity of targets' merger consideration to the acquirers' merger announcement returns when they have higher incentives to mitigate adverse selection problems. I also find a significantly positive relation between *Elast* and *RetCor* (β_{13}=1.145, p<0.01), suggesting that acquirers offer merger considerations that are more sensitive to the acquirers' merger announcements when targets and acquirers experience more similar economic shocks.

Consistent with *Hypothesis 1*, the estimated coefficients on *AQ2* (β_1=-1.770, p<0.01) in column 2 and *AQ* (β_1=-2.331, p<0.01) in column 3 are both significantly negative. Holding all control variables constant at the sample means, the marginal effect of *AQ* on *Elast* in column 3 (untabulated) indicates that decreasing targets' accounting quality from the 75th percentile to the 25th percentile increases bid elasticity by 0.04. This suggests that the effect of targets' accounting quality on bid elasticity is economically significant. In both column 2 and 3, I find a marginally negative relation between *Elast* and *Toehold* (In column 2, β_{15}=-0.419, p<0.1; in column 3, β_{15}=-0.405, p<0.1), which indicates bid elasticity is lower when acquirers own stocks of targets at the

merger announcements. Effects of other determinants in column 2 and 3 are consistent with findings in column1.

5.2. CROSS-SECTIONAL VARIATION IN THE EFFECTS OF TARGET ACCOUNTING QUALITY

Table 6 shows results testing the relation between targets' accounting quality and bid elasticity when acquirers have greater incentives to mitigate adverse selection problems and when acquirers can collect more information about target firms from other sources. The main variable of interest in column 1 is the interaction term between targets' accounting quality and the indicator of whether the target is larger relative to the acquirer (*AQ*×*RelLarge*). Consistent with *Hypothesis 2*, the estimated coefficient on $AQ \times RelLarge$ (β_2=-3.641, p<0.01) is significantly negative, suggesting that the relation between targets' accounting quality and bid elasticity is stronger when acquirers have greater incentives to mitigate adverse selection problems.

In column 2, the variable of interest is the interaction term between targets' accounting quality and targets' analyst following ($AQ \times AnalystCover$). The estimated coefficient on $AQ \times AnalystCover$ (β_2 =1.252, p<0.05) is significantly positive, which is consistent with *Hypothesis 3*. This result suggests that the relation between targets' accounting quality and bid elasticity is weaker when acquirers can collect more information about target firms from other sources.

5.3. ROBUSTNESS TESTS: ALTERNATIVE MEASURES OF TARGET INFORMATION ASYMMETRY

Table 7 presents results using two alternative measures of information asymmetry about targets. In columns 1 and 2, I replace target stock-return nonsynchronicity with the analyst forecast dispersion of target firms (*Dispersion*) and targets' bid-ask spread (*BidAsk*), respectively.

Consistent with *Hypothesis 1,* the estimated coefficient on *AQ* is significantly negative (β_1 =-2.311, p<0.01) in column 1 and is marginally negative (β_2=-1.150, p<0.1) in column 2.

In general, results from multivariate tests are consistent with my hypotheses. Specifically, targets' accounting quality is associated with the merger consideration design in acquisition agreements. As targets' accounting quality increases, targets' merger consideration is less sensitive to the acquirers' merger announcement returns. The relation between targets' accounting quality and bid elasticity is stronger when acquirers have greater incentives to mitigate adverse selection problems and is weaker when acquirers can obtain more information about target firms from other channels.

One limitation of this paper is that I can only examine acquisition agreements that are announced to the public. Some transactions may not reach the stage of acquisition agreements due to poor targets' accounting quality or the design of merger consideration. Because of the lack of available data, such transactions are not included in the sample, which may cause selection bias. Therefore, results in this paper should be interpreted with this in mind.

6. Conclusion

In this study, I investigate how targets' accounting quality affects merger consideration design in acquisition agreements. I test my hypotheses using a sample of 1,390 acquisition agreements of publicly listed firms between 1996 and 2017.

Consistent with my prediction, I find that acquirers offer a merger consideration that is less sensitive to the acquirers' merger announcement returns when targets' accounting quality is higher, after controlling for target characteristics, acquirer characteristics, and deal characteristics, which suggests that targets' accounting quality plays an important role in the design of merger consideration. My results hold for all of my measures of targets' accounting quality and alternative measures of information asymmetry about targets. Then, I examine how the relation between targets' accounting quality and bid elasticity changes when acquirers have greater incentives to mitigate adverse selection problems, and when acquirers can obtain more information about target firms from other sources. I hypothesize and find that the relation between targets' accounting quality and bid elasticity is stronger when acquirers have greater incentives to mitigate adverse selection problems and is weaker when acquirers can obtain more information about target firms from other channels.

Overall, my findings suggest that high-quality targets' accounting information reduces information uncertainty about targets, helps acquirers value targets more precisely and identify potential synergies, and in turn mitigates adverse selection problems. In addition, high-quality targets' accounting information benefits targets by reducing their risks of being exposed to the acquirers' merger announcement returns.

This study makes several contributions. First, it contributes to the literature on the role accounting information plays in determining targets' merger consideration (Skaife and Wangerin, 2013; McNichols and Stubben, 2015). Second, this paper contributes to the literature on determinants of bid elasticity (Houston and Ryngaert, 1997; Officer, 2004). Finally, this study contributes to the literature on the role of M&A contractual features in mitigating adverse selection problems (Datar et al., 2001; Cadman et al., 2014; Macias and Moeller, 2016).

Future research can examine whether the design of merger consideration is associated with M&A quality. If merger consideration that is sensitive to the acquirers' merger announcement returns helps acquirers mitigate adverse selection problems, synergies and efficiencies created by such acquisitions should be reflected in acquirers' post-acquisition performance and financial reporting for business combination.

Table 1: Sample Selection and Sample Distribution

This table presents the sample selection procedure (Panel A) and descriptive statistics of bid elasticity by targets' industry (Panel B) for the sample of 1,390 acquisitions between 1996 and 2017. Industries are defined based on the Fama-French 12 Industry Classification.

[a] Initial merger agreements are available for 2,946 out of 3,153 acquisitions. For the other 207 acquisitions whose initial merger agreements are unavailable, the deal status of 89 of them is "Withdrawn", 7 of them are "Pending", and 111 of them are "Completed".

Panel A: Sample Selection Procedure

	N
All domestic mergers and acquisitions (M&A) with announcement dates between 1996 and 2017	246,028
Less:	
Deals in which the acquirer is a private firm	(131,997)
Deals in which the target is a private firm	(85,431)
Deals in which the acquirer owns 50% or more of the target before the transaction	(288)
Deals in which the acquirer seeks to own less than 50% of the target after the deal is completed	(20,629)
Hostile or unsolicited deals and deals with status of "Rumor", "Dis Rumor", or "Status Unknown"	(530)
Deals in which the total assets of a target constitute less than 1 percent or more than 45 percent of the combined total assets of the two firms	(2,907)
Total deals acquired from SDC	4,246
Less:	
Deals in which the acquirer or the target cannot be located on Compustat	(745)
Deals in which the acquirer or the target cannot be located on CRSP	(348)
Total deals for the collection of acquisition agreements	3,153
Less:	
Deals in which acquisition agreements cannot be found on EDGAR[a]	(207)
Deals with missing bid elasticity data	(3)
Deals with missing target accounting quality data	(1,416)
Deals with missing data of control variables in main tests	(137)
Total deals in final sample	1,390

Panel B: Descriptive Statistics of Bid Elasticity by Industry

Industry	N	%	Mean	S.D.	Q1	Median	Q3
Consumer Nondurables	49	3.53%	0.22	0.33	0.00	0.00	0.40
Consumer Durables	21	1.51%	0.23	0.39	0.00	0.00	0.34
Manufacturing	159	11.44%	0.33	0.43	0.00	0.00	0.81
Oil, Gas, and Coal Extraction and Products	88	6.33%	0.64	0.40	0.42	0.82	1.00
Chemicals and Allied Products	28	2.01%	0.29	0.43	0.00	0.00	0.75
Business Equipment	369	26.55%	0.36	0.44	0.00	0.00	1.00
Telephone and Television Transmission	47	3.38%	0.58	0.40	0.15	0.63	1.00
Utilities	56	4.03%	0.48	0.44	0.00	0.42	1.00
Wholesale, Retail, and Some Services	118	8.49%	0.26	0.38	0.00	0.00	0.50
Healthcare, Medical Equipment, and Drugs	178	12.81%	0.34	0.42	0.00	0.00	0.76
Finance	92	6.62%	0.40	0.42	0.00	0.32	0.85
Other	185	13.31%	0.36	0.43	0.00	0.05	1.00
Total	1,390	100%	0.37	0.43	0.00	0.04	0.96

Table 2: Descriptive Statistics of Bid Elasticity

This table shows descriptive statistics of bid elasticity based on the type of merger consideration for the sample of 1,390 acquisitions between 1996 and 2017.

			Elast				
Type of Merger Consideration	N	%	Mean	S.D.	Q1	Median	Q3
Plain fixed-ratio stock offers	335	24.10%	1.00	0.00	1.00	1.00	1.00
Fixed-ratio stock offers with cash components	206	14.82%	0.53	0.24	0.40	0.52	0.70
Plain floating-ratio collar offers	60	4.32%	0.61	0.22	0.41	0.65	0.77
Floating-ratio collar offers with cash components	49	3.53%	0.34	0.18	0.18	0.33	0.44
Plain fixed-ratio collar offers	41	2.95%	0.33	0.22	0.16	0.27	0.52
Fixed-ratio collar offers with cash components	19	1.37%	0.13	0.10	0.05	0.09	0.19
Plain cash offers	627	45.11%	0.00	0.00	0.00	0.00	0.00
Plain floating-ratio stock offers	29	2.09%	0.00	0.00	0.00	0.00	0.00
Floating-ratio stock offers with cash components	24	1.73%	0.00	0.00	0.00	0.00	0.00
Total	1,390	100%	0.37	0.43	0.00	0.04	0.96

Table 3: Descriptive Statistics

This table provides the descriptive statistics for measures of bid elasticity, targets' accounting quality, target characteristics, acquirer characteristics, and deal characteristics for the sample of 1,390 acquisitions between 1996 and 2017. All continuous variables are winsorized at 1% and 99% levels. All variables are defined in Table A1.

Variable	N	Mean	S.D.	Q1	Median	Q3
Panel A: Measures of Merger Consideration Design						
Elast	1,390	0.37	0.43	0.00	0.04	0.97
Panel B: Measures of Target Accounting Quality						
AQ	1,390	-0.09	0.07	-0.11	-0.07	-0.04
AQ1	1,390	-0.09	0.08	-0.12	-0.07	-0.04
AQ2	1,390	-0.09	0.07	-0.11	-0.06	-0.04
Panel C: Target Characteristics						
Age	1,390	2.80	0.60	2.30	2.71	3.26
AnalystCover	1,390	1.71	0.97	1.10	1.79	2.40
BidAsk	1,389	0.04	0.03	0.03	0.04	0.05
Dispersion	975	0.01	0.02	0.00	0.00	0.01
MtB	1,390	3.45	4.69	1.41	2.15	3.54
NonSyn	1,390	1.45	0.89	0.86	1.49	2.11
Size	1,390	19.74	1.93	18.40	19.75	21.10
Panel D: Acquirer Characteristics						
AcqDE	1,390	0.76	1.50	0.10	0.38	0.84
AcqMtB	1,390	3.73	3.72	1.72	2.57	4.14
AcqSize	1,390	21.79	1.91	20.47	21.79	23.12
Panel E: Deal Characteristics						
Comp	1,390	0.04	0.19	0.00	0.00	0.00
Earnout	1,390	0.00	0.07	0.00	0.00	0.00
RelLarge	1,390	0.74	0.44	0.00	1.00	1.00
RetCor	1,390	0.28	0.24	0.10	0.26	0.45
SameInd	1,390	0.61	0.49	0.00	1.00	1.00
Toehold	1,390	0.03	0.18	0.00	0.00	0.00

Table 4: Pairwise Correlation Matrices

This table reports pairwise correlations among regression variables. * denotes significance at 10%. All continuous variables are winsorized at 1% and 99% levels. All variables are defined in Table A1.

		1	2	3	4	5	6	7	8	9	10
1	*Elast*	1.0000									
2	*AQ*	-0.0313	1.0000								
3	*AQ1*	-0.0138	0.9004*	1.0000							
4	*AQ2*	-0.0520*	0.8813*	0.5963*	1.0000						
5	*Age*	-0.0600*	0.2932*	0.2072*	0.3198*	1.0000					
6	*AnalystCover*	0.1101*	0.1504*	0.1019*	0.1709*	0.1350*	1.0000				
7	*BidAsk*	0.1111*	-0.4506*	-0.3475*	-0.4624*	-0.3890*	-0.3173*	1.0000			
8	*Dispersion*	0.0062	-0.1582*	-0.1487*	-0.1268*	-0.1210*	-0.1205*	0.3575*	1.0000		
9	*MtB*	0.0872*	-0.2065*	-0.1989*	-0.1746*	-0.0402	0.0605*	0.0685*	-0.0054	1.0000	
10	*NonSyn*	-0.0846*	-0.1150*	-0.0461*	-0.1639*	-0.2771*	-0.5702*	0.2198*	0.0877*	0.0264	1.0000
11	*Size*	0.1097*	0.2672*	0.1787*	0.3035*	0.3448*	0.7491*	-0.5318*	-0.2643*	0.1329*	-0.6124*
12	*AcqDE*	0.0639*	0.0794*	0.0488*	0.0996*	0.0516*	0.0385	-0.0981*	0.0480	-0.0078	-0.0483*
13	*AcqMtB*	0.0552*	-0.0852*	-0.0532*	-0.0992*	-0.0693*	0.0578*	0.0741*	0.0098	0.1485*	0.0676*
14	*AcqSize*	-0.0882*	0.1920*	0.1379*	0.2111*	0.2066*	0.5630*	-0.3555*	-0.1599*	0.1024*	-0.4198*
15	*Comp*	-0.0010	-0.0546*	-0.0496*	-0.0466*	0.0406	-0.0057	0.0369	-0.0388	0.0620*	0.0032
16	*Earnout*	-0.0022	-0.0996*	-0.0466*	-0.1314*	-0.0286	0.0128	0.0298	0.1491*	0.0016	0.0308
17	*RelLarge*	0.2384*	0.0784*	0.0358	0.1029*	0.1653*	0.2097*	-0.2017*	-0.0805*	0.0421	-0.2036*
18	*RetCor*	0.1800*	0.0967*	0.0396	0.1333*	0.2105*	0.4044*	-0.1697*	-0.0297	0.0066	-0.5971*
19	*SameInd*	0.0729*	-0.0099	-0.0045	-0.0095	-0.0414	-0.0174	0.0538*	0.0073	0.0054	-0.0531*
20	*Toehold*	-0.0078	0.0438	0.0493*	0.0277	-0.0544*	-0.0070	-0.0243	-0.0286	0.0028	0.0346

		11	12	13	14	15	16	17	18	19	20
11	*Size*	1.0000									
12	*AcqDE*	0.0715*	1.0000								
13	*AcqMtB*	0.0580*	0.4775*	1.0000							
14	*AcqSize*	0.7329*	-0.0061	0.1750*	1.0000						
15	*Comp*	0.0174	0.0483*	0.0287	-0.0563*	1.0000					
16	*Earnout*	-0.0155	-0.0209	-0.0174	-0.0342	0.1623*	1.0000				
17	*RelLarge*	0.2831*	0.0838*	-0.1369*	-0.2703*	0.0630*	0.0389	1.0000			
18	*RetCor*	0.4791*	0.0165	-0.0550*	0.3009*	0.0303	-0.0349	0.2153*	1.0000		
19	*SameInd*	-0.0258	-0.0076	-0.0371	-0.0803*	0.0467*	-0.0147	0.0576*	0.0970*	1.0000	
20	*Toehold*	0.0347	0.0033	-0.0397	-0.0180	0.0281	-0.0122	0.0267	-0.0221	-0.0247	1.0000

Table 5: The Impact of Target Accounting Quality on Bid Elasticity

This table presents the results of the double-sided Tobit regressions testing the impact of targets' accounting quality on the merger consideration design in acquisition agreements. The dependent variable is the bid elasticity (*Elast*). The variable of interest in column (1), *AQ1*, is the product of -1 and the standard deviation of the target's accrual residuals over three to five fiscal years preceding the year *t*-1. Accrual residual is the residual from the accruals quality model that is developed by Dechow and Dichev (2002) and augmented by McNichols (2002). The variable of interest in column (2), *AQ2*, is measured similarly using the firm-specific residuals from Eq. (2) (McNichols and Stubben, 2015). The variable of interest in column (3), *AQ*, is the mean of *AQ1* and *AQ2*, which is the main measure of target accounting quality in this paper. All models include calendar year dummies. Standard errors are reported in parentheses and clustered at target firm level. *, **, and *** denotes significance level at 10%, 5% and 1%, respectively. All variables are defined in Table A1.

	(1) *Elast*	(2) *Elast*	(3) *Elast*
AQ1	-1.899***		
	(0.538)		
AQ2		-1.770***	
		(0.568)	
AQ			-2.331***
			(0.631)
NonSyn	-0.156**	-0.149**	-0.153**
	(0.070)	(0.070)	(0.070)
Age	-0.292***	-0.289***	-0.281***
	(0.074)	(0.074)	(0.074)
AnalystCover	0.003	-0.000	-0.001
	(0.062)	(0.062)	(0.062)
MtB	0.0137*	0.0156*	0.013
	(0.008)	(0.008)	(0.008)
Size	0.272***	0.273***	0.278***
	(0.056)	(0.056)	(0.056)
AcqDE	0.020	0.023	0.024
	(0.031)	(0.031)	(0.031)
AcqMtB	0.0292**	0.0279**	0.0273**
	(0.013)	(0.013)	(0.013)
AcqSize	-0.253***	-0.253***	-0.252***
	(0.050)	(0.050)	(0.050)
Comp	-0.309	-0.302	-0.313
	(0.209)	(0.208)	(0.209)
Earnout	0.165	-0.012	0.014
	(0.527)	(0.513)	(0.516)
RelLarge	0.427***	0.432***	0.429***
	(0.145)	(0.145)	(0.145)
RetCor	1.145***	1.157***	1.149***
	(0.212)	(0.211)	(0.211)
SameInd	0.107	0.108	0.108
	(0.081)	(0.081)	(0.081)
Toehold	-0.403	-0.419*	-0.405*
	(0.246)	(0.243)	(0.245)
Year	Yes	Yes	Yes
N	1,390	1,390	1,390
pseudo-R^2	0.133	0.132	0.133

Table 6: Cross-sectional Tests – The Impact of Target Accounting Quality on Bid Elasticity

This table presents the results of the double-sided Tobit regressions testing the impact of targets' accounting quality on the merger consideration design in acquisition agreements when acquirers have greater incentives to resolve adverse selection problems and when acquirers can collect more information about targets from other channels. The dependent variable is the bid elasticity (*Elast*). The variable of interest in column (1) is the interaction between *AQ* and *RelLarge*. *AQ* is the target accounting quality. *RelLarge* is an indicator variable that equals one if the market capitalization of a target constitutes more than 5 percent of the combined market capitalization of the acquirer and the target, and zero otherwise. The variable of interest in column (2) is the interaction between *AQ* and *AnalystCover*. *AnalystCover* is the analyst coverage of the target firm *i* in fiscal year *t*-2, measured as the natural logarithm of the sum of 1 and the number of analysts providing an annual EPS forecast. All models include calendar year dummies. Standard errors are reported in parentheses and clustered at target firm level. *, **, and *** denotes significance level at 10%, 5% and 1%, respectively. All variables are defined in Table A1.

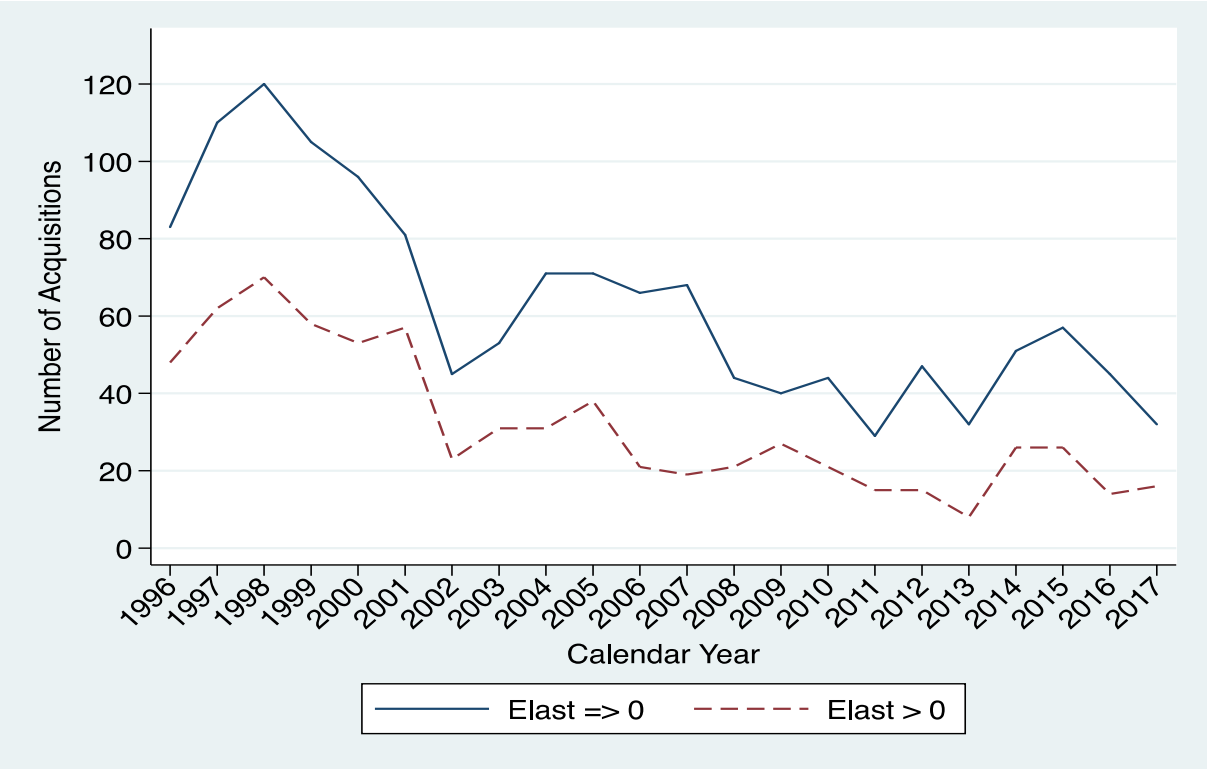
	(1) *Elast*	(2) *Elast*
AQ	0.484	-4.228***
	(1.125)	(1.126)
RelLarge	0.083	0.427***
	(0.189)	(0.145)
AQ×RelLarge	-3.641***	
	(1.297)	
AnalystCover	0.006	0.112
	(0.062)	(0.082)
AQ×AnalystCover		1.252**
		(0.596)
NonSyn	-0.157**	-0.146**
	(0.070)	(0.070)
Age	-0.274***	-0.290***
	(0.074)	(0.074)
MtB	0.013	0.012
	(0.008)	(0.008)
Size	0.275***	0.275***
	(0.056)	(0.056)
AcqDE	0.027	0.023
	(0.030)	(0.031)
AcqMtB	0.0257*	0.0274**
	(0.013)	(0.013)
AcqSize	-0.250***	-0.250***
	(0.050)	(0.050)
Comp	-0.310	-0.304
	(0.209)	(0.211)
Earnout	-0.090	0.026
	(0.519)	(0.520)
RetCor	1.163***	1.146***
	(0.212)	(0.211)
SameInd	0.106	0.107
	(0.081)	(0.081)
Toehold	-0.365	-0.426*
	(0.245)	(0.245)
Year	Yes	Yes
N	1,390	1,390
pseudo-R^2	0.135	0.134

Table 7: Robustness Tests – The Impact of Target Accounting Quality on Bid Elasticity

This table presents the results of the double-sided Tobit regressions testing the impact of targets' accounting quality on the merger consideration design in acquisition agreements using alternative measures of information asymmetry about targets. The dependent variable is the bid elasticity (*Elast*). The variables of interest in Column (1) are the target accounting quality, *AQ*, and the analyst forecast dispersion of the target firm *i* in fiscal year *t*-1, Dispersion. Dispersion is calculated as the standard deviation of analysts' annual EPS forecast divided by beginning stock price. The variables of interest in Column (2) are the target accounting quality, *AQ*, and the mean of daily bid-ask spreads of the target firm *i* over fiscal year *t*-1, *BidAsk*. The daily bid-ask spread is calculated as the difference between ask and bid divided by the mean of ask and bid. All models include calendar year dummies. Standard errors are reported in parentheses and clustered at target firm level. *, **, and *** denotes significance level at 10%, 5% and 1%, respectively. All variables are defined in Table A1.

	(1) *Elast*	(2) *Elast*
AQ	-2.311***	-1.150*
	(0.721)	(0.644)
Dispersion	3.628	
	(2.388)	
BidAsk		13.49***
		(2.469)
Age	-0.253***	-0.190***
	(0.085)	(0.073)
AnalystCover	0.087	0.000
	(0.100)	(0.062)
MtB	0.013	0.007
	(0.008)	(0.008)
Size	0.314***	0.371***
	(0.065)	(0.057)
AcqDE	0.029	0.047
	(0.036)	(0.030)
AcqMtB	0.022	0.017
	(0.016)	(0.013)
AcqSize	-0.230***	-0.249***
	(0.056)	(0.049)
Comp	-0.326	-0.359*
	(0.206)	(0.205)
Earnout	-0.265	0.088
	(0.711)	(0.498)
RelLarge	0.421**	0.448***
	(0.174)	(0.144)
RetCor	1.325***	1.266***
	(0.225)	(0.194)
SameInd	0.117	0.093
	(0.093)	(0.080)
Toehold	-0.468*	-0.422*
	(0.276)	(0.241)
Year	Yes	Yes
N	975	1,389
pseudo-R^2	0.154	0.143

Figure 1: Sample Distribution by Announcement Year



This figure depicts sample distribution by announcement year between 1996 and 2017. The solid line represents the full sample of 1,390 acquisitions and the dashed line represents the subsample of 700 acquisitions with bid elasticity that is greater than zero.

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Appendix A

Table A1: Variable Definition

Variable		Definition
		Panel A: Measures of Merger Consideration Design
Elast	=	The percentage change in the value of the target's total compensation to a one percent change in the acquirer's merger announcement returns.
		Panel B: Measures of Target Accounting Quality
AQ	=	The mean of *AQ1* and *AQ2*. *AQ1* is measured as the product of -1 and the standard deviation of the target's accrual residuals over three to five fiscal years preceding the year *t*-1. Accrual residual is the residual from the accruals quality model that is developed by Dechow and Dichev (2002) and augmented by McNichols (2015). *AQ2* is measured similarly using the firm-specific residuals from Eq. (2) (McNichols and Stubben, 2015). Both models are estimated by industry-year, where industries are defined based on Fama-French 48 Industry Classification (Fama and French, 1997).
		Panel C: Target Characteristics
Age	=	The target's age at the end of fiscal year *t*-1, measured as the natural logarithm of the number of years since the firm was first covered by the Compustat.
AnalystCover	=	The analyst coverage of the target firm *i* in fiscal year *t*-2, measured as the natural logarithm of the sum of 1 and the number of analysts providing an annual EPS forecast.
BidAsk	=	The mean of daily bid-ask spreads of the target firm *i* over fiscal year *t*-1. The daily bid-ask spread is calculated as the difference between ask and bid divided by the mean of ask and bid.
Dispersion	=	The analyst forecast dispersion of the target firm *i* in fiscal year *t*-1, calculated as the standard deviation of analysts' annual EPS forecast divided by beginning stock price.
MtB	=	The target's market-to-book ratio at the end of fiscal year *t*-1, calculated as market value of equity divided by book value of equity.
Nonsyn	=	The three-year mean of target-return nonsynchronicity ending in the calendar year prior to the merger announcement, measured as $-\log\left(\frac{R^2}{1-R^2}\right)$, where R^2 is estimated by year based on the following model: $Ret_{i,t} = \beta_0 + \beta_1 MktRet_{i,t} + \beta_2 MktRet_{i,t-1} + \beta_3 IndRet_{i,t} + \beta_4 IndRet_{i,t-1} + \epsilon_{i,t}$, where $Ret_{i,t}$ is the target's weekly return for week *t*, $MktRet_{i,t}$ and $MktRet_{i,t-1}$ are the value-weighted weekly market return for weeks *t* and *t*-1, respectively, and $IndRet_{i,t}$ and $IndRet_{i,t-1}$ are the weekly industry return for weeks *t* and

Table A1: Variable Definition (continued)

Variable		Definition
		t-1, respectively, with the target firm's return excluded. The industries are defined based on two-digit SIC codes (Martin and Shalev, 2017).
Size	=	The natural logarithm of the target's market value of equity measured 60 days prior to the merger announcement date.
		Panel D: Acquirer Characteristics
AcqDE	=	The acquirer's debt-to-equity ratio at the end of fiscal year *t*-1, calculated as long-term debt divided by book value of equity.
AcqMtB	=	The acquirer's market-to-book ratio at the end of fiscal year *t*-1, calculated as market value of equity divided by book value of equity.
AcqSize	=	The natural logarithm of the acquirer's market value of equity measured 60 days prior to the merger announcement date.
		Panel E: Deal Characteristics
Comp	=	An indicator variable that equals one if more than one bidder bids for the target within a 1-year window centered on the merger announcement date, and zero otherwise.
Earnout	=	An indicator variable that equals one if the deal includes an earnout, and zero otherwise.
RelLarge	=	An indicator variable that equals one if the market capitalization of the target constitutes more than 5 percent of the combined market capitalization of the acquirer and the target, and zero otherwise. The market capitalization of acquirers and targets is measured 60 days prior to the merger announcement date.
RetCor	=	The correlation of the target and the acquirer weekly stock returns over a 200-trading-day period ending 30 days preceding the merger announcement date.
SameInd	=	An indicator variable that equals one if the target and the acquirer are in the same industry prior to the merger announcement date, and zero otherwise. Industries are defined based on Fama-French 12 Industry Classification.
Toehold	=	An indicator variable that equals one if the acquirer owns stock of the target at the announcement reported by SDC, and zero otherwise.

Fiscal year *t*-1 is the latest fiscal year ending at least 90 days prior to the merger announcement date.

Appendix B

In this Appendix, I provide examples of each type of stock consideration that are obtained from the acquisition agreements.

Stock consideration can be generally categorized into four types (Fuller, 2003).

The first and most common type is called a fixed-ratio stock offer. It allows an acquirer to offer a fixed number of shares for each share of a target when the deal is completed. The exchange ratio is fixed and determined prior to the merger announcement. An example of this type of stock compensation is in the acquisition agreement announced on December 21, 2006, between Citizens & Northern Corporation (the acquirer) and Citizens Bancorp, Inc. (the target). The specific details of the merger consideration terms are as follows:

> (iii) Conversion of Citizens Common Stock. Each share of Citizens Common Stock issued and outstanding immediately prior to the Effective Time (other than shares canceled pursuant to Section 1.02(e)(ii) and Dissenting Citizens Shares) shall be converted into the right to receive, at the election of the holder thereof either: (A) 1.297 shares of C&N Common Stock, subject to adjustment as provided in Section 1.02(j) below (the "Stock Consideration"), or (B) $28.57 in cash (the "Cash Consideration"). Notwithstanding the foregoing, and giving effect to Section 1.02(e)(ii) hereof, (1) the number of shares of Citizens Common Stock to be converted into the right to receive the Stock Consideration on the Effective Date shall be equal to fifty percent (50%) of the total number of shares of Citizens Common Stock issued and outstanding on the Effective Date and (2) the number of shares of Citizens Common Stock to be converted into the right to receive the Cash Consideration on the Effective Date shall be equal to fifty percent (50%) of the total number of shares of Citizens Common Stock issued and outstanding on the Effective Date,

minus (x) the number of Dissenting Citizens Shares, if any, and (y) the aggregate number of shares with respect to which cash is paid in lieu of fractional shares pursuant to Section 1.02(e)(iv).

The second type is a floating-ratio collar offer. A floating exchange ratio is offered to a target if the acquirer's stock price is in the prespecified range. If the acquirer's stock price is out of the range, the target receives a fixed number of the acquirer's shares for its each share. An example of this type of stock compensation is in the acquisition agreement announced on June 18, 2014, between Univest Corporation of Pennsylvania (the acquirer) and Valley Green Bank (the target). The specific details of the merger consideration terms are as follows:

(c) Subject to the provisions of this Agreement, at the Effective Time, automatically by virtue of the Merger and without any action on the part of any Person, each share of Valley Green Common Stock (excluding Treasury Stock, Univest Owned Shares and shares of Valley Green Common Stock that are owned by Valley Green shareholders properly exercising their dissenters rights pursuant to Section 1222 of the PBC ("Dissenter Shares")) issued and outstanding immediately prior to the Effective Time shall be converted into the right to receive an amount of Univest Common Stock (the "Common Stock Consideration") equal to the quotient, carried to four (4) decimal places (the "Exchange Ratio"), of (A) $27.00 divided by (B) the Univest Share Price (as defined below) of a share of Univest Common Stock; provided, however, that in no event may the Exchange Ratio be less than 1.2231 or greater than 1.4949. If the Exchange Ratio would otherwise be less than 1.2231 or more than 1.4949, then 1.2231 or 1.4949, respectively, shall be used. For purposes of this Agreement, the "Univest Share Price" of the Univest Common Stock shall be the average of the closing sale prices of Univest Common Stock

(as reported on Nasdaq) for each consecutive trading day during the twenty (20) days immediately preceding the Effective Time. The Common Stock Consideration, together with cash in lieu of fractional shares, is sometimes referred to herein collectively as the "Merger Consideration."

The third type is called a fixed-ratio collar offer. It offers a target a fixed exchange ratio as long as the acquirer's stock price is in the prespecified range. If the acquirer's stock price is out of the range, the target receives a fixed dollar amount for its each share. An example of this type of stock compensation is in the acquisition agreement announced on February 22, 2011, between IBERIABANK Corp. (the acquirer) and OMNI Bancshares, Inc. (the target). The specific details of the merger consideration terms are as follows:

(a) Except for shares of OMNI Common Stock as to which dissenters' rights have been perfected and not withdrawn or otherwise forfeited ("Dissenters' Shares") under the LBCL, and as otherwise provided herein, at the Effective Date each outstanding share of OMNI Common Stock will be converted into the "Merger Consideration" pursuant to the Exchange Ratio set forth below: (i) 0.3313 shares of IBKC Common Stock (to the nearest ten-thousandth of a share) to be exchanged for each share of OMNI Common Stock and cash (without interest) payable with respect to any fractional share of IBKC Common Stock (as determined below); or (ii) if the Market Value is greater than $60.53 per share, the adjusted Exchange Ratio shall equal the quotient (to the nearest ten-thousandth of a share) obtained by dividing $20.05 by the Market Value; or (iii) if the Market Value is less than $54.77 per share, the adjusted Exchange Ratio shall equal the quotient (to the nearest ten-thousandth of a share) obtained by dividing $18.15 by the Market Value; plus (iv) in lieu of issuing any fractional share of IBKC Common Stock which would otherwise be

distributable to an OMNI shareholder as determined following application of Section 2.2(a)(i), (a)(ii) or (a)(iii) above, each holder of OMNI Common Stock who would otherwise be entitled thereto, after aggregating into whole shares all fractional shares of IBKC Common Stock to which such holder is entitled by virtue of the Merger, upon surrender of the certificate(s) which represented OMNI Common Stock, will receive, without interest, cash equal to such fractional share multiplied by the Market Value.

The last type is referred to as a floating-ratio stock offer. It conditions the number of shares issued to a target on the acquirer's stock price. The exchange ratio can be determined before or after the merger announcement and equal to either the quotient of the target's price divided by the acquirer's price or that of a fixed dollar amount divided by the acquirer's price. The value of this type of target stock compensation is not sensitive to the acquirers' merger announcement returns as it is predetermined and fixed. An example of this type of stock compensation is in the acquisition agreement announced on December 20, 2004, between Perficient, Inc. (the acquirer) and ZettaWorks, LLC (the target). The specific details of the merger consideration terms are as follows:

2.05 Purchase Price and Related Matters. In consideration of the sale and transfer of all of Seller's rights, title and interests in the Acquired Assets, Buyer shall assume the Assumed Liabilities and shall pay to the Seller an aggregate purchase price of $7,886,000 (the "Purchase Price"), subject to adjustment pursuant to Section 2.06 below. At the Closing, Buyer shall pay the Purchase Price to Seller by: (a) wire transfer of immediately available funds (the "Cash Payment") equal to $3,850,000, subject to adjustment pursuant to Section 2.06(a), in accordance with the wiring instructions provided by Seller to Buyer on or prior to the Closing Date; and (b) the issuance and delivery to Seller of certificate(s) in the name of Seller evidencing, in the aggregate, such number of shares of Parent

Common Stock (the "Stock Payment") equal to (i) $4,036,000 divided by the Parent Stock Per Share Price, less (ii) the Escrow Shares.

The acquirer's stock price that used to determine the exchange ratio is usually defined as the average acquirer closing price over a fixed number of trading days (usually 10 or 20 days) prior to the closing of the deal. For either type of collar offers, either acquirer or target may have the right to terminate the deal if the acquirer's stock price is out of the prespecified range.

Appendix C

Following Officer (2004), the bid elasticity (*Elast*) is computed as $Elast = \frac{\partial TCOMP/\partial V}{\partial BCOMP/\partial V} \times \frac{BCOMP}{TCOMP}$, where *V* is the current value of the combined firm and measured as the sum of the acquirer's market capitalization 4 days prior to the merger announcement (*BCOMP*) and the promised payment to the target under the acquisition agreement (*TCOMP*). Because $BCOMP = (V - TCOMP)$, $\frac{\partial BCOMP}{\partial V} = 1 - \frac{\partial TCOMP}{\partial V}$. $\frac{\partial TCOMP}{\partial V}$ is computed as the sum of the deltas from each component of the target's compensation. I use a fixed-ratio collar offer described in **Appendix B** as an example of bid elasticity computation.

For the acquisition agreement announced on February 22, 2011, between IBERIABANK Corp. (the acquirer) and OMNI Bancshares, Inc. (the target), let *B(T)* be the number of acquirer (target) outstanding shares on the merger announcement date. When the acquirer's stock price is between \$54.77 and \$60.53, the target receives a fraction of the combined firm equals *S*, which is computed as $S = 0.3313T/ (0.3313T + B)$. When the acquirer's stock price is less than \$54.77 (greater than \$60.53), the target receives a fixed payment of \$18.15*T* (\$20.05*T*). Thus, the fixed-ratio collar offer described above consists of a long position of *S* put option on the value of combined firm with a strike price of \$18.15*T*/*S*, and a short position of *S* call option on the value of combined firm with a strike price of \$20.05*T*/*S*. Therefore, *IBKC*/*OMNI*: $\frac{\partial TCOMP}{\partial V} = S(1 + \delta_p - \delta_c)$, where δ_p (δ_c) represents a delta of a put option (call option).

I use the Black-Scholes option pricing model to compute deltas. I use the six-month T-bill rate as the risk-free interest rate, and time between the merger announcement date and effective date as the time to maturity. If the time to maturity is more than 365 days, I cap it at 365 days. The variance of the returns on the combined firms is calculated as weekly returns on a value-weighted

portfolio including both targets and acquirers over a 200-trading-day period ending 30 days prior to the merger announcement. The weights used to calculate the variance of the returns on the combined firm are based on the market capitalization of the target and the acquirer 4 days prior to the merger announcement. I assume the dividend yield of the combined firm equals zero.

Vita

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