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Essays on the economic consequences of information asymmetry and accounting conservatism in the mergers and acquisitions market

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فتعالى الله الملك الحق ولا تعجل بالقرآن من قبل أن يقضى إليك وحيه وقل رب زدني علما (سورة طه، ١١٤)

Supremely exalted is Allah, the King, the Truth, and do not make haste [O Muhammad] with the Quran before its revelation is made complete to you and say: O my Lord! increase me in knowledge (The Qur'an, 20:114).

Abstract

Merger and acquisition (M&A) transactions arguably represent one of the most significant events that firms might experience over their lifecycles; yet many transactions are value-neutral or value-destroying for shareholders of acquiring firms. Throughout three empirical essays, this thesis explores the economic consequences of two aspects of information uncertainty of the target firm (the seller) on acquisition decisions of the acquiring firm (the buyer) and outcomes of M&A transactions. First, this thesis investigates whether the target's ex ante information asymmetry benefits the target's shareholders at the expense of the acquirer's shareholders, and whether it affects the M&A deal termination and renegotiation decisions, as well as the acquirer's long-term performance. The results show that while a target's information asymmetry is beneficial for shareholders of target firms by increasing takeover premiums they receive and positive abnormal stock returns they achieve upon the announcement of M&A deals, it negatively affects shareholder wealth of acquiring firms. The results also reveal that deals involving target firms with high information asymmetry are more likely to be terminated or renegotiated. Furthermore, the results show that the acquirer is more likely to post-acquisition report goodwill impairment losses when the target firm has high information asymmetry, indicating that the target's information asymmetry negatively influences the acquirer's long-term performance. Next, this thesis explores the link between conservative accounting of the target firm and the takeover premium. It also examines the moderating effect of the target's ex ante information asymmetry on this link. The results show that the winning acquirer incurs a lower premium when the financial reporting of the target firm is more conservative over the years preceding the acquisition, suggesting that the target's conservative accounting helps the acquirer to bid more effectively in the M&A market by avoiding the potential overpayment to target shareholders. Moreover, the results show that the role of the target's conservative accounting in decreasing the possibility of the acquirer's overpayment is more prominent when the target firm has high ex ante information asymmetry. Finally, this thesis examines whether conservative accounting of the target firm is associated with shareholder wealth of both the target and acquiring firms, as reflected by the stock market reaction to the announcement of the M&A deal. The results show that abnormal stock returns for target shareholders around the deal announcement are lower when the financial reporting of the target firm is more conservative. The results also reveal that abnormal returns for shareholders of the winning acquirer are higher when the target's conservative accounting is high. These results denote that conservative accounting of a target firm mitigates the potential disruption in the wealth transfer from acquirer shareholders to target shareholders in M&A transactions that might arise from the high information uncertainty of target firms. Overall, this thesis suggests that managers of acquiring firms should consider discounting the values of target firms in M&A transactions when target firms have high levels of information uncertainty. This thesis also suggests that a target's conservative accounting plays a vital role in the efficient capital allocation of economic resources by mitigating the adverse consequences of information asymmetry between merging parties in the M&A market.

Dedication

To the memory of my beloved parents.

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In the name of Allah, the Most Gracious, the Most Merciful.

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List of Abbreviations

#	Number
%	Percentage
CAR	Cumulative Abnormal Return
CRSP	Centre for Research in Security Prices
Eq.	Equation
FASB	Financial Accounting Standards Board
Freq.	Frequency
IASB	International Accounting Standards Board
M&As	Mergers and Acquisitions
max	Maximum
min	Minimum
MTB	Market-to-Book
N	Number of observations
OLS	Ordinary Least Squares
R&D	Research and Development
ROA	Return on Assets
ROE	Return on Equity
sd	Standard Deviation
SIC	Standard Industry Classification
TL Eikon	Thomson Reuters Eikon
U.S.	United States

Chapter 1

Introduction

1.1 Research motivation and objectives

Merger and acquisition (M&A) transactions arguably represent one of the most significant events that any firm might experience over its lifecycle. M&A transactions could be a mechanism for firms to achieve strategic objectives, including facilitating access to new sources of capital, reducing competition, obtaining larger market share, achieving tax savings, obtaining new technologies and know-how, reducing costs, diversifying risks, etc. Nevertheless, if not effectively initiated and/or efficiently executed, these transactions might harm firms' operations and activities, shareholder wealth, and managers' career and reputation (Golubov et al., 2013; Renneboog & Vansteenkiste, 2019).

M&A transactions incorporate the transfer of massive economic resources between entities within the economy. The number and value of M&A transactions that are announced every year are substantially large. For instance, in only 2019, there were 49,849 transactions announced worldwide that were valued about $3.7 trillion. Of these transactions, there were 15,776 transactions in the North America with a value of about $2 trillion.[1] Therefore, M&A transactions are not only significant events for the owners or shareholders of the merging firms (i.e., the acquirer (the buyer) and the target (the seller)), but also for several stakeholders, including managers and employees of these firms, investment banks, competitors, regulators, and lawyers.

With respect to the shareholder wealth effect of M&A transactions, it is documented that takeovers represent value-creating transactions for target shareholders. That is, target shareholders usually receive large premiums and achieve large abnormal stock returns upon the announcement of takeover transactions.[2] In contrast, shareholders of bidders are typically the losers, or at best not the big winners, in corporate takeovers

[1] Source: Institute for Mergers, Acquisitions and Alliances. Web page: https://imaa-institute.org/mergers-and-acquisitions-statistics/ (Accessed: 15/6/2020).

[2] Merger and acquisition (M&A) transactions and corporate takeovers are used interchangeably throughout this thesis.

as they achieve negative, zero, or mildly positive abnormal stock returns around the announcement of these transactions, on average.[3] Thus, the causes and consequences of these transactions have been extensively researched in the literature of several disciplines, including accounting, finance, economics, strategic management, and law, among others.

It has been argued that the large premiums offered by acquiring firms to target shareholders and the neutral- or destroying-value effect of M&A transactions for acquirer shareholders are due to the acquirer's overpayment to target shareholders (e.g., Black, 1988; Morck et al., 1990; Eccles et al., 1999; Hietala et al., 2002; Harford et al., 2012; de Bodt et al., 2018). This means that bidders[4] offer prices that are more than the intrinsic value of the target and the expected synergies of the acquisition (McNichols & Stubben, 2015).

Different theoretical bases have been proposed by researchers to interpret the acquirer's overpayment in M&A transactions. A main theoretical basis that has been widely used in the literature is the *principal-agent conflict*, in which personal incentives of managers to acquire other firms (such as empire building) could lead to overpayment (e.g., Jensen & Meckling, 1976; Jensen, 1986; Morck et al., 1990). Another theoretical basis is the irrational behaviour of bidder managers (such as managerial hubris or overconfidence), even if their interests are aligned with those of shareholders, that lead them to fall victims in the winner's curse problem; that is, overestimating the target's value and the expected synergies and, therefore, paying too much to target shareholders (e.g., Roll, 1986; Thaler, 1988; Malmendier & Tate, 2008).

This thesis aims to extend our understanding of the determinants of the large premiums incurred by acquiring firms and the shareholder wealth effect and other outcomes of M&A transactions. In particular, this thesis explores whether information uncertainty of the target firm affects the acquirer's acquisition decisions, shareholder wealth of the merging firms, and the acquirer's long-term performance. M&A transactions represent a unique setting for examining the effects of information uncertainty about investment opportunities (i.e., target firms) on investment decisions and shareholder wealth. That is, these transactions involve two agents of two firms (the target and the acquirer) in an asymmetric information context, where managers of the target

[3] See, for instance, Andrade et al. (2001) and Eckbo (2009) for a review of the literature.

[4] The buyer, the bidder, the bidding firm, the acquirer, and the acquiring firm are used interchangeably throughout the thesis.

firm know more about their firm than what managers of the acquiring firm know (Hansen, 1987; McNichols & Stubben, 2015).

Therefore, bidders confront information uncertainty about the intrinsic value of the target firm and, consequently, the expected synergies from the acquisition. The information uncertainty arises from the incomplete information about the target firm that could be due to the target's high information asymmetry, the target's low quality of accounting information, and/or the less information gathered by bidders about the target.

A growing stream of research focuses on uncertainty about the true value of the target firm arising from information asymmetry and how this uncertainty influences decisions of bidding firms as well as deal dynamics and outcomes (Officer et al., 2009; Raman et al., 2013; Skaife & Wangerin, 2013; Amel-Zadeh & Zhang, 2015; Dionne et al., 2015; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Cheng et al., 2016; Martin & Shalev, 2017; Li & Tong, 2018; Borochin et al., 2019). However, evidence of this research is mixed. On the one hand, some studies show that the target's information asymmetry increases the difficulty that the bidder encounters in estimating the true value of the target firm and expected synergies and, thus, makes the bidder incurs a large premium and negatively affects the wealth of the bidder's shareholders. Therefore, these studies interpret the large premiums offered by bidders to target shareholders and the negative effect on bidder announcement returns in transactions involving target firms with high ex ante information asymmetry as an indication for the acquirer's overpayment in these transactions.

On the other hand, as investors discount the value of equities with high information asymmetry (e.g., Glosten & Milgrom, 1985; Hertzel & Smith, 1993; O'Hara, 2003), other studies argue that large premiums offered by bidders to target firms with high information asymmetry point to the discounted values of these targets, and that bidders respond to this value-discounting by offering smaller discounts for opaque targets as a bargain. Importantly, these studies show that bidder shareholders earn higher returns upon the announcement of M&A deals involving target firms with high information asymmetry, arguing that shareholders of the bidder agree with the valuation of the bidder's managers that would have more information than the market about the target firm.

The conflicting results and interpretations of the effects of the target's information asymmetry on shareholder wealth of the bidding firm could be due to the use of different

proxies for the target's information asymmetry and the use of different sample sizes. Therefore, the first objective of this thesis is to disentangle the mixed results provided by prior studies by (1) using several proxies for information asymmetry that capture the informational advantage of the target's managers over the market and (2) using a large sample of M&A deals. In particular, this thesis investigates whether the target's ex ante information asymmetry benefit target shareholders at the expense of bidder shareholders. To achieve this objective, this thesis examines the effects of the target's ex ante information asymmetry on the takeover premium offered by the bidder to target shareholders, target announcement returns, bidder announcement returns, and combined announcement returns of portfolios of target and bidding firms.

Once the deal agreement is signed and publicly announced, the bidder gains access to private information of the target firm and starts a detailed review of the target firm, which is called the transactional diligence review. During this stage, if the bidder figures out material adverse risks, the bidder's decision could be entirely withdrawing the deal, or at least renegotiating the agreement with the target. This thesis anticipates that bidders are more likely to discover material adverse risks during the transactional diligence review when target firms have higher levels of ex ante information asymmetry, which induce the bidder to terminate the deal. In addition, if the bidder decides to consummate the deal despite the target's high level of ex ante information asymmetry, it is more likely that the bidder downward renegotiates the initial deal price with the target to reduce the risk of overpayment.

Although prior studies have examined the impact of a target's information asymmetry on shareholder wealth, the evidence on whether a target's information asymmetry affects the ultimate outcome of the deal (i.e., being completed or terminated) is scarce. Further, it is unexplored whether a target's information asymmetry affects the dynamics of the M&A deal by influencing the likelihood of the downward renegotiation of the initial deal price offered by the bidder (i.e., the final price paid by the winning bidder is lower than the initial deal price). Relatedly, a new strand of research finds that uncertainty, at the macro level, decreases the value and volume of M&A transactions and, importantly, increases the likelihood of the deal termination and renegotiation (e.g., Bhagwat et al., 2016; Nguyen & Phan, 2017; Bonaime et al., 2018; Cao et al., 2019). Thus, the second objective of this thesis is to extend the extant literature by exploring the effects of a target's information asymmetry (i.e., uncertainty at the firm level) on the likelihood of the deal termination as well as the likelihood of the deal renegotiation.

The third objective of this thesis is to investigate the impact of a target's information asymmetry on the likelihood that the acquirer ex post recognises and reports goodwill impairment losses. There is not any study, as to the best of the author's knowledge, that examines the impact of a target's information asymmetry on the acquirer's post-acquisition performance using the metric of goodwill impairment losses. Goodwill impairment losses are recognised when the fair values of the previously acquired targets reduce. If the target's information asymmetry increases the difficulty of estimating the true value of the target firm and, therefore, might lead the acquirer to overpay for target shareholders, this study expects that the acquirer will suffer from goodwill impairment losses in the post-acquisition periods.

Examining the impact of a target's information asymmetry on the acquirer's goodwill impairment is important for several reasons. First, there is an increase in the frequency of the recognition of goodwill impairment losses by firms, particularly during and after the financial crisis of 2008, and the values of these losses are economically significant (Darrough et al., 2014). In addition, different from Cheng et al. (2016), who examine the effect of the target's information asymmetry on the acquirer's post-acquisition operating performance using ROA, this study uses goodwill impairments that represent a more direct measure for the performance of prior acquisitions. Furthermore, knowing the long-term impact of a target's information asymmetry on the acquirer's performance would help in disentangling the mixed evidence regarding the short-term impact on shareholders' wealth of the acquiring firm. That is, if large premiums offered to target firms with high ex ante information asymmetry point to the discounted values of these targets, the likelihood that acquirers recognise goodwill impairment losses in post-acquisition periods would be lower.

The fourth objective of this thesis is to explore whether conservative accounting of the target firm helps bidders to bid more effectively by avoiding the possibility of overpayment to target shareholders. In particular, this thesis evaluates whether the takeover premium incurred by the winning bidder is lower when the pre-acquisition financial reporting of the target firm is more conservative. In addition, this thesis examines whether the association between the target's conservative accounting and the takeover premium cross-sectionally differs based on the level of the target's ex ante information asymmetry.

Exploring the role of accounting conservatism of the target firm in the M&A market is important for at least three reasons. First, accounting conservatism represents a

main accounting principle that dictates the exercise of caution in recognising and measuring accounting numbers in financial reports (Givoly & Hayn, 2000).[5] Accounting conservatism is generated as a result of information asymmetries between insiders and outsiders as it is perceived by users in both the debt and equity markets as a governance mechanism that reduces the adverse effects of information asymmetry and, therefore, improves the firm's information environment (e.g., Watts, 2003a; LaFond & Watts, 2008). Accordingly, conservative accounting can play a vital role in mitigating the possibility of the acquirer's overpayment by improving the target's information environment and, therefore, alleviating the adverse effects of information asymmetry between the target and acquiring firms.

Additionally, despite the extant literature on the benefits of accounting conservatism to users of accounting information (e.g., Ahmed et al., 2002; Ball & Shivakumar, 2005; Zhang, 2008; García Lara et al., 2011; Kim et al., 2013; Li, 2015; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017; Hsu et al., 2017; D'Augusta & DeAngelis, Forthcoming), evidence on whether and how conservatism is beneficial for participants in M&A transactions is very limited. Thus, this thesis extends prior research on the benefits of conservatism by assessing whether accounting conservatism of the target firm helps the winning bidder to incur a lower premium and, therefore, reduces the possibility of overpayment to target shareholders.

Further, there is a long-standing debate in the standard-setters circle on the benefits and costs of accounting conservatism to users of accounting information. In 2010, the Financial Accounting Standard Board (FASB) and the International Accounting Standard Board (IASB) eliminated the conservatism/prudence principle from their joint conceptual framework. They claim that conservatism makes accounting information biased and that it is not compatible with the neutrality of accounting information. In 2018, the concept of prudence (i.e., conservatism) was reintroduced in the Conceptual Framework of the IASB-only project. The U.S. GAAP did not follow this movement though. Therefore, this thesis would inform the ongoing debate on the benefits and costs of conservatism by investigating its potential role for users in a less-explored setting (i.e., the M&A market).

[5] There is no one generally accepted definition for accounting conservatism; however, it is typically defined as the asymmetric degrees of verification required by accountants and accounting policies for recognising economic gains versus losses (Basu, 1997; Watts, 2003a).

The final objective of this thesis is to assess whether the target's conservative accounting is associated with shareholder wealth of both the target and the acquirer, as reflected by the market reaction to the announcement of M&A transactions. As target shareholders prefer to receive higher premiums in M&A deals, the argued mitigating effect of the target's conservative accounting of the acquirer's overpayment is expected to be negatively perceived by target shareholders. In other words, the target's conservative accounting is expected to decrease the large positive abnormal returns accrue to target shareholders around the announcement of M&A deal. In contrast, avoiding overpayment by the winning acquirer is expected to be positively perceived by acquirer shareholders. In addition to the above-mentioned reasons of investigating the role of the target's conservative accounting in the M&A market, examining the relationship between the target's conservative accounting and shareholder wealth of both the target and the acquirer would reveal whether conservatism of the target firm can mitigate the disruption in wealth transfer from acquirer to target shareholders in M&A transactions, arguably by alleviating the adverse effects of the target's information asymmetry on the acquirer's acquisition decisions and shareholder wealth.

1.2 Research contributions and main findings

This thesis offers several important contributions to the literature. First, this thesis disentangles the mixed evidence and interpretations in the literature regarding the effects of uncertainty about the target's intrinsic value arising from the target's ex ante information asymmetry on merger outcomes. The findings of this thesis show that while a target's information asymmetry is beneficial for target shareholders by increasing takeover premiums they receive and achieving higher positive abnormal stock returns upon the announcement of the M&A deal, it negatively affects shareholder wealth of acquiring firms. This indicates that acquirer shareholders perceive deals involving target firms with high ex ante information asymmetry as less profitable. This negative reaction is consistent with the evidence that acquirers offer larger premiums in deals involving target firms with high information asymmetry, which might point to the acquirer's overpayment in these deals. Thus, this thesis provides evidence that is in favour of the acquirer's overpayment explanation, rather than the target's discounted value explanation, in M&A transactions involving target firms with high ex ante information asymmetry. Moreover, the findings show that a target's information asymmetry decreases combined announcement returns for portfolios of targets and acquirers. Consequently,

this thesis provides evidence for the negative net effect of a target's information asymmetry on the efficiency of the capital allocation of economic resources.

Second, this thesis establishes a link between uncertainty about the target's intrinsic value arising from the target's ex ante information asymmetry and the merger activity and dynamics. The findings of this thesis show that a target's information asymmetry increases the likelihood of terminating the M&A deal. Furthermore, given the deal is completed, the findings reveal that a target's information asymmetry increases the likelihood of the downward renegotiation of the initial deal price. These findings suggest that some bidders in the M&A market rationally react to the high information uncertainty of the target firm by terminating deals involving target firms with high ex ante information asymmetry that might be initially overestimated. The findings also indicate that bidders might decide to consummate deals involving target firms with high information asymmetry but after considering discounting their initial bids due to the high information risk of these targets. Therefore, this thesis adds to the evidence of the recent research showing that uncertainty at the macro-level (such as the market, regulatory and political uncertainty) affects the termination and renegotiation decisions of M&A deals (e.g., Bhagwat et al., 2016; Nguyen & Phan, 2017; Bonaime et al., 2018; Cao et al., 2019) by providing evidence that uncertainty at the firm-level also partly explains the activity and dynamics of M&A transactions.

Third, this thesis proposes a new determinant for the post-acquisition reporting of goodwill impairment losses by acquiring firms. The findings of this thesis reveal that the likelihood to subsequently report goodwill impairment losses by acquiring firms increases with a target's ex ante information asymmetry. This negative impact of the target's information asymmetry on the acquirer's long-term performance is in line with the negative effect of the target's information asymmetry on the acquirer's short-term market performance. Therefore, this evidence lends a further support for the acquirer's overpayment explanation in M&A transactions. Moreover, the findings of this thesis suggest that despite the rational behaviour of some bidders in M&A transactions who decide to terminate or renegotiate deals involving target firms with high ex ante information asymmetry, other bidders do not rationally react to the high risk of these deals. That is, in addition to the negative short-term market performance, acquirers who decide to consummate deals involving target firms with high information asymmetry subsequently underperform. This indicates that these acquirers are likely to have overpaid for target shareholders, which could be rooted in the principal-agent conflicts and/or the

winner's curse/behavioural biases. This evidence provides support for the recent evidence that bidders overbid in M&A transactions (de Bodt et al., 2018) and that winning bidders subsequently underperform after M&A transactions (Malmendier et al., 2018). In particular, the evidence in this thesis suggests that a target's information asymmetry represents a channel through which bidders overestimate the true values of target firms and, consequently, ex post underperform.

Fourth, this thesis introduces a new role for accounting conservatism in the M&A market. The findings of this thesis suggest that accounting conservatism of the target firm helps bidders to bid more effectively in the M&A market and avoid the possibility of overpayment for target shareholders. Specifically, the findings show that accounting conservatism of target firms is negatively associated with takeover premiums offered by winning acquirers in successful or completed M&A transactions. This finding indicates that acquirers incur lower premiums when target firms adopt more conservative accounting practices over the years preceding the announcement of M&A transactions. This is consistent with the evidence that accounting conservatism improves the firm's information environment by increasing the credibility of accounting information, decreasing the adverse selection risk of the firm's insiders, and playing a disciplining role for the information provided by other sources such as the firm management and financial analysts. Furthermore, the findings demonstrate that the negative association between the target's conservative accounting and the takeover premium is more prominent when the target's information asymmetry is high, indicating that acquirers benefit most from the target's conservative accounting when uncertainty about the target's intrinsic value is greatest. Thus, this thesis suggests that the target's conservative accounting plays an important role in the M&A market by mitigating the adverse consequences of the high uncertainty about the target's intrinsic value, arising from the target's ex ante information asymmetry, in M&A transactions.

Finally, this thesis provides novel evidence that accounting conservatism of the target firm affects shareholder wealth of both the target and the acquirer involving in the M&A transaction. The findings of this thesis reveal that target shareholders earn lower stock abnormal returns around the acquisition announcement date when the target's conservative accounting is high. This finding might suggest that the potential mitigating effect of the target's conservative accounting for the acquirer's overpayment is negatively perceived by shareholders of the target firm. In contrast, the findings show that announcement abnormal stock returns for the winning acquirer are higher when the

target's conservative accounting is high, indicating that shareholders of the winning acquirer positively perceive the role of the target's conservative reporting in alleviating the adverse consequences of the target's information asymmetry and decreasing the likelihood of the acquirer's overpayment to target shareholders. Thus, the evidence in this thesis suggests that conservative accounting of the target firm mitigates the potential disruption in the wealth transfer from acquirer shareholders to target shareholders in M&A transactions that might arise from the high uncertainty about the target's intrinsic value.

1.3 Outline of the thesis

This thesis proceeds as follows. Chapter 2 provides a brief background on the setting that the thesis uses to investigate the economic consequences of information asymmetry and accounting conservatism (i.e., M&A transactions). In this chapter, the stages of the typical M&A transaction are explained. The chapter also presents the empirical evidence on gains generated from M&A transactions for shareholders of the target and the acquirer. Then, the chapter discusses the main theoretical bases proposed in the literature to explain the acquirer's overpayment in M&A transactions, which are employed in developing the predictions and hypotheses of the empirical chapters of this thesis. In addition, the chapter briefly reviews the literature on the determinants of gains and other outcomes of M&A transactions. Finally, it sheds light on the event study methodology that is typically employed in M&A research.

Chapter 3 investigates the effects of information asymmetry of the target firm on merger outcomes. These outcomes include the takeover premium offered by acquirers to the target firm, the market reaction to the announcement of M&A transactions, the likelihood of the deal termination, the likelihood of the downward renegotiation of the initial deal price, and the acquirer's post-acquisition performance. The chapter critically reviews and shows the mixed evidence regarding the effects of information asymmetry of the target firm on merger outcomes. Based on a two-faceted theoretical framework (namely, the principal-agent conflicts and the winner's curse/behavioural biases), research hypotheses are developed. The research design is clarified in detail, including the different proxies of information asymmetry, the measurement of merger outcomes, and the econometric model. Sample and descriptive statistics are then explained. Empirical results and robustness tests are discussed before the chapter concludes.

Chapter 4 explores the role of accounting conservatism of the target firm in the M&A market. It focuses on whether and how the target's conservative accounting is associated with the takeover premium. After reviewing the literature, the chapter explains the conservatism principle and clarifies how conservatism can improve the information environment of the target firm and, therefore, affects the acquirer's decision of the offer price or the premium. Two hypotheses are developed that test the association between the target's conservatism and the takeover premium as well as the cross-sectional difference of this association based on the target's ex ante information asymmetry. The chapter also gives detail on the measures of accounting conservatism used in the chapter and the research design followed to test the hypotheses (namely, the two-stage approach). Then, the chapter presents and discusses descriptive statistics, empirical results, and robustness checks. Finally, it concludes.

Chapter 5 investigates whether accounting conservatism of the target firm is related to the market reaction of both the target and the acquirer to the announcement of M&A transactions. Using similar arguments and research design of those used in Chapter 4, two research hypotheses are developed and tested. The chapter highlights the role of conservatism in mitigating the disruption in shareholder wealth transfer from the acquirer to the target in M&A transactions. It provides evidence that is consistent with its predictions, and that supports the evidence provided in the previous two empirical chapters.

Finally, Chapter 6 concludes the thesis. It provides a summary of the findings of the thesis and illuminates several implications of these findings to several parties, including shareholders, managers, researchers, and policymakers. A number of limitations of the findings of the thesis are also clarified. Last, the chapter suggests several promising avenues for future research.

Chapter 2

Background on mergers and acquisitions

2.1 Introduction

Merger and acquisition (M&A) transactions involve a reallocation of massive amounts of resources between parties participating in the deal. They represent one of the most significant events that any firm might experience in its lifecycle. If they are carefully implemented, these events could enable firms to achieve high synergies by, for instance, saving costs, obtaining new technologies and know-how, achieving tax savings, avoiding unfavourable changes in market supply or demand, entering new markets, increasing customer base, reducing or eliminating competition, accessing to a new capital, and improving corporate governance systems. However, these events could also be detrimental to firms' operations and activities, shareholders' wealth, and managers' reputation and career if they are not effectively initiated or efficiently executed (Golubov et al., 2013; Renneboog & Vansteenkiste, 2019).

This chapter provides a brief introduction to mergers and acquisitions. It firstly describes the main stages of the typical M&A transaction. Second, it briefly presents the empirical evidence on the value-creation or destruction of M&A transactions for shareholders of both the target and acquiring firms. Third, it discusses the main theories employed in the literature in interpreting the effect of M&A transactions on shareholder wealth. Fourth, it reviews some of the prior studies addressing different determinates and factors influencing gains and outcomes of M&A transactions. Last, it sheds light on the event study methodology that represents the main methodology used in M&A research.

2.2 The process of M&A

The process of M&A generally begins with initial screening for a potential target firm by an acquirer motivated mainly by achieving some strategic objectives (McNichols & Stubben, 2015; Cai et al., 2016). Then, by selecting a specific target, an extensive review of that target is conducted by the acquirer that might last for a long period. This lengthy

process of reviewing the target is called the *due diligence process*. As explained by Skaife and Wangerin (2013), due diligence can be viewed as a three-stage process. This process begins with an acquirer that depends only on publicly available information about the target, including information in its financial statements, SEC filings, analyst reports, press releases, and any other public sources. This stage is called a *preliminary due diligence*. Despite the huge amount of information managers of acquiring firms can get in this stage, they might not have any informational advantage relative to other participants in the market who have also the same access to public information.

Then, if merger participants decided to negotiate a deal, the acquirer and the target sign a confidentiality agreement. By this agreement, a *due diligence review* stage begins, in which the acquirer gains limited access to private information that might include the target's R&D projects and management reports and projections (Skaife & Wangerin, 2013). This review might also include site visits to the target and meetings with key employees. Depending on public and private information acquirer's managers obtain during these two previous stages, they estimate the target's value and determine a purchase price that they offer for this target if they decided to acquire it.

In the case of accepting the offer an acquirer provides, the acquisition agreement is signed between deal participants. In this time, the acquisition agreement usually becomes publicly announced, and the acquirer starts a *transactional due diligence* stage. Although this agreement includes binding conditions for both the acquirer and the target to complete the deal, it does not mean the deal cannot be terminated. That is, because of potential adverse events that might arise during the period between the announcement and the closure dates, acquisition participants incorporate material adverse change clauses in acquisition agreements that provide the acquirer the right to costlessly quit and do not complete the deal in the event of occurring or discovering material adverse events during the transactional due diligence stage (Denis & Macias, 2013). During the transactional due diligence, the acquirer gains more access to the target's private information than it was available during prior stages. The acquirer might get access to accounting estimates, policies related to recognising revenues, different contracts, etc. (Skaife & Wangerin, 2013). This stage, therefore, represents the last chance for the acquirer to verify the accuracy of its estimation of the value of the target and that there are not any unexpected adverse risks. The outcome of this stage could be either completing or terminating the deal. Prior studies show that the termination of announced M&A deals could be due to different reasons including, for instance, the negative reaction by the market to the deal

announcement that might motivate insiders to terminate the deal (Luo, 2005), receiving a better bid after signing the deal agreement (Marquardt & Zur, 2015), and uncovering material adverse risks (Denis & Macias, 2013; Skaife & Wangerin, 2013; Marquardt & Zur, 2015).

Given a deal has been completed, the integration of the two entities begins. In this final stage, many factors are considered by the acquirer including, for example, the determination of the vision of the new entity, the decision of whether firing or retaining the target's current human resources including employees and managers, asset allocation between the two entities, etc. (Cai et al., 2016). Along with all other factors, during this final stage, accounting systems of merger participants would be integrated to capture the merger's combined economic effects (Cai et al., 2016). **Figure 2.1** shows the different stages of the M&A process as follows:

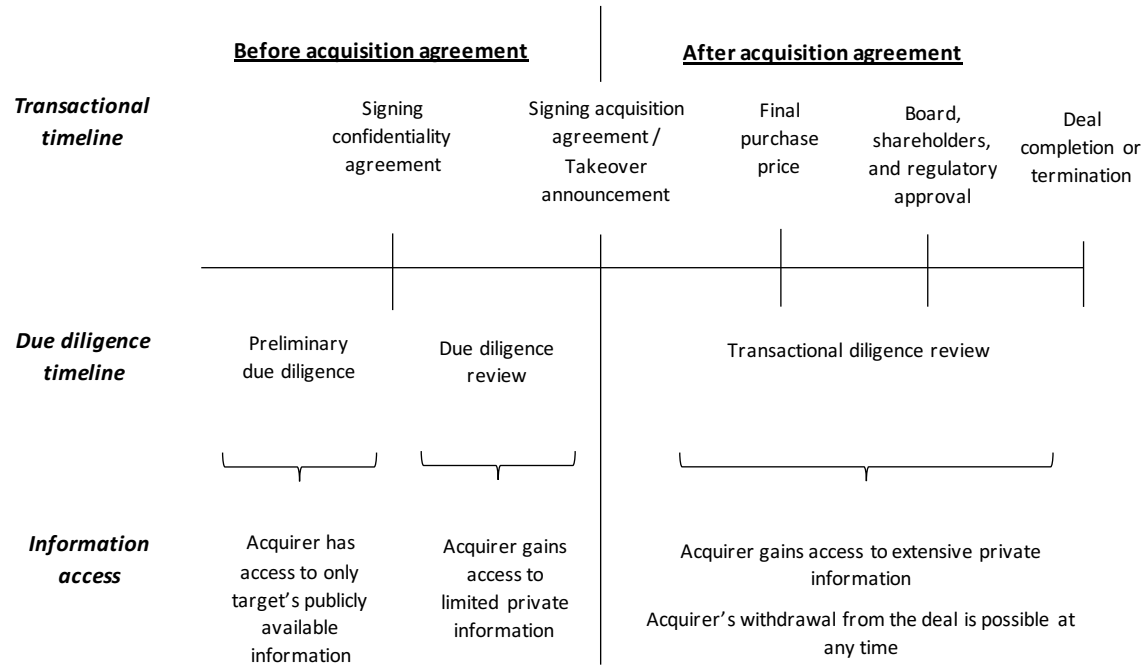

Figure 2.1: The process of M&A

Source: Adapted from Skaife and Wangerin (2013) and Amel-Zadeh and Zhang (2015)

2.3 Takeover gains

The value creation or destruction resulting from corporate takeovers for shareholders and the distribution of this value between target and acquirer shareholders represent main issues that have been widely addressed by researchers. Despite the wide variation in the literature regarding the exact effect of takeovers on shareholder wealth, it is typically documented that corporate takeovers represent value-creating transactions for target shareholders. That is, target shareholders usually earn significantly positive abnormal returns around the announcement of takeover transactions. On the other hand, shareholders of bidders are the losers, or at best not big winners, in corporate takeovers as they achieve negative, zero, or mildly positive abnormal returns around the announcement of these transactions, on average. In addition, corporate takeovers are on average value-creating transactions on the combined level of both the target and the acquirer (i.e., the weighted average of the combined abnormal announcement returns for the portfolio of both the target and the acquirer).

A huge body of empirical research provides evidence supporting the above-mentioned effect of corporate takeovers on shareholder wealth.[6] For instance, Bradley et al. (1988) show that returns for bidder shareholders have declined from being positive in the 1960s (about 4%) to be negative in the 1980s (-3%). They also show that combined returns for shareholders of both the target and the bidder are positive. Some argue that the adoption of the Williams Act in 1968 that increased the cost of tender offers to bidders as well as state antitakeover laws and firms' defencing of takeovers in the 1980s have increased the bargaining power of targets and led to the decline in bidder returns over the period from 1960s to 1980s (Weston et al., 2001).

Using a sample of acquisitions and divestitures during the period 1990-1999, Mulherin and Boone (2000) provide evidence that while target shareholders earn significantly positive returns around the deal announcement date (about 20.2% on average), shareholders of bidders earn mildly negative but insignificant returns. In addition, they find combined returns for shareholders of both targets and bidders to be positive. For the full sample of takeovers announced during the period from 1988 to 2000, Officer (2003) shows that abnormal returns for bidder shareholders are significantly negative on average (equal -1.16%).

[6] For a survey for the wide evidence on takeover gains, see, for example, Ruback and Jensen (1983), Jarrell et al. (1988), Andrade et al. (2001), Martynova and Renneboog (2008), and Eckbo (2009).

Using a sample of takeovers announced over the period 1980 to 2005, Betton et al. (2008) report that combined abnormal returns for target and bidder shareholders over the run-up period, the announcement period, and the total of the two periods, i.e., the total takeover gains (from day -40 to +10), are significantly positive on average. They report that the total takeover gains over the whole period equals 2%. Betton et al. (2009) find that the average bidder returns is significantly negative (equals -1.2%) for a full sample of mergers and tender offers for public targets.

Evidence also shows that bidders typically offer large premiums to targets' shareholders in order to get control over target firms. For instance, Chatterjee et al. (2012) show that the average takeover premium the winning or successful bidder offers to the target shareholders equals 62.7% when the premium is estimated based on the target's share price about three months (trading day -64) prior to the deal announcement date.

Recently, Malmendier et al. (2018) use a unique approach to examine the long-term effect of M&A transactions on acquirer performance. They employ merger contests in order to use the group of losing contesters as a proper matching group for the group of winning contesters. They find that the post-merger market performance of winners is significantly lower than the performance of losers. They also show that target inefficiencies, among others, represent a possible channel for the long-term negative effect of M&As on the acquirer's market performance.

Therefore, the wide literature on takeover gains generally shows that takeovers create value for shareholders on the combined level of the target and the acquirer and that this value primarily accrues to target shareholders who are offered with large premiums. On the other hand, acquirer shareholders earn negative, zero, or mildly positive abnormal returns around the takeover announcement date.

It has been argued for a long time that large premiums offered to target shareholders as well as the neutral- or destroying-value effect of M&A transactions for bidder shareholders are due to the acquirer's overpayment to target shareholders (e.g., Black, 1988; Morck et al., 1990; Eccles et al., 1999; Hietala et al., 2002; Harford et al., 2012; de Bodt et al., 2018). This means that acquirers pay more than the intrinsic value of the target and the expected synergies of the acquisition (McNichols & Stubben, 2015).

Using an approach that is based on the condition that value-maximizing bidders should determine optimal bid premiums by trading-off between the probability of acquisition success and acquisition profits, de Bodt et al. (2018) provide evidence

supporting the existence of overbidding in takeovers. They also show that overbidding is rooted by the existence of agency conflicts between bidder managers and shareholders and, indirectly, by bidder managers' failure to fully consider the winner's curse.

In the following section, the theoretical bases commonly employed in the literature to interpret overpayment by acquirers in corporate takeovers are discussed in detail.

2.4 Overpayment in M&As: Theoretical underpinnings

Different theoretical bases have been proposed by researchers to interpret the acquirer's overpayment in M&A transactions. A main theoretical basis that has been widely used in the literature is the *principal-agent conflict*, in which personal incentives of bidder managers to undertake investment, including acquiring other firms, could lead to overpayment. Another theoretical basis is bidder managers' irrational behaviour, even if their interests are aligned with those of shareholders, that lead them to fall victims in the winner's curse problem; that is, overestimating the target's value and the expected synergies and, therefore, paying too much to target shareholders. These two explanations are discussed below.

2.4.1 Agency conflicts or managerial motives

A prominent theoretical basis for the acquirer's overpayment in takeovers is the principal-agent conflicts or personal managerial incentives positing that managers might make decisions of acquiring other firms to make their firms grow in the sake of achieving their personal interests and not maximising shareholders' wealth (Jensen & Meckling, 1976). The agency conflicts between managers and shareholders are likely to be exacerbated in firms that have large free cash flows (i.e., excess cash flows over required cash flows for funding all positive net present value investments) and firms that have lower investment or growth opportunities (Jensen, 1986). That is, managers of these firms might have objectives to grow their firms and invest excess cash flows in value-decreasing investments rather than disgorging excess cash to shareholders.

Managers' objectives to grow their firms might relate to increasing their power of control and having more visible and prestigious positions (Jensen, 1986; Black, 1988). That is, instead of paying out excess cash flows to shareholders, empire-building

managers invest in pet projects that are against shareholders' objective of wealth maximisation. Another managerial objective might be gaining greater compensation (Murphy, 1985) by running a bigger firm as compensation is often associated with firm size. Moreover, managers might have objectives to decrease the risk of losing their financial and human capital linked to only one firm or industry by pursuing diversification programmes. For instance, Amihud and Lev (1981) demonstrate that managers make decisions to acquire other firms in unrelated businesses (i.e., conglomerate mergers) to diversify their employment risk associated with a specific industry. Jensen (1986) also shows that firms with free cash flows and lower growth opportunities tend to diversify by acquiring firms in unrelated businesses that negatively influence bidder shareholders' wealth. Further, in his model, Jensen (1986) demonstrates the significant role of leverage and debt service payments (as a substitution for dividend pay-outs) in monitoring managers' decisions and, consequently, decreasing agency costs of free cash flows.

Morck et al. (1990) also show that bidder personal managerial motives drive bad acquisition decisions of other firms and the negative market reaction to these decisions. Specifically, they find that bidder returns are negatively associated with the announcement of three types of acquisitions that are likely to be driven by personal managerial objectives: acquisitions of unrelated businesses (i.e., unrelated diversification), acquisitions of growing firms, and acquisitions by poorly performing managers. Consistent with Amihud and Lev (1981) and Shleifer and Vishny (1989), they argue that managers' acquisition decisions of unrelated diversification, growing firms or when they are poorly performing are indicators for mangers' objectives to diversify their human capital risk and reduce the risk of losing their jobs. Therefore, they argue that to the extent that the decision to acquire another firm achieves the personal objectives of bidder managers, the higher the possibility is to overpay for target shareholders and negatively affect bidder shareholders' wealth.

Based on the predictions of the agency theory, several studies examine whether different corporate governance mechanisms could align managers' interests with those of shareholders and, consequently, affect acquisition decisions. For instance, many studies show that compensation contracts that link the personal wealth of acquiring firms' managers to the firm value lead to better acquisition decisions and, therefore, improving the short- and long-term market reaction to the announcement of M&A transactions. Examples include Tehranian et al. (1987) for the use of long-term compensation, Datta et al. (2001) and Feito-Ruiz and Renneboog (2017) for the use of equity-based

compensation, Lin et al. (2011) for the use of insurance protection for directors and executives, and Phan (2014) for the use of inside debt for CEOs. Other studies address whether characteristics of the board of directors influence the monitoring role of the board of the acquiring firm and, thus, affecting the performance of M&A deals. For instance, Byrd and Hickman (1992) and Dahya et al. (2019) show that board independence is positively associated with short- and long-term acquisition performance. Masulis et al. (2007) also find that the separation between CEO and Chairman positions is positively associated with acquirer returns.

2.4.2 The winner's curse

Capen et al. (1971) and Oren and Williams (1975) are probably the first to introduce the winner's curse explanation in the literature. Although the market value of an asset in a takeover contest might be publicly known to all bidders contesting to acquire this asset, the intrinsic value of this asset is unknown. According to the winner's curse, the acquirer who wins the takeover contest is always the one who most excessively estimates the value of the auctioned asset (Bazerman & Samuelson, 1983). The private value of the asset to each bidder is outside the boundaries of the winner's curse explanation (Black, 1988; Varaiya, 1988). That is, it is only related to the irrational behaviour of bidders regarding the estimation of the common value of the asset. Thus, bidders might perceive their ex ante estimations of the public value of the target as unbiased.

The likelihood that the winning bidder falls victim in the winner's curse and the magnitude of overpayment increase with the increase in two factors: competition between bidders over the target as well as uncertainty about the intrinsic value of the target (Bazerman & Samuelson, 1983; Varaiya & Ferris, 1987; Varaiya, 1988; Eckbo, 2009). That is, as competition between bidders or uncertainty about the intrinsic value of the target increases, the variation in the estimation between bidders of the target's value increases and, consequently, the likelihood of valuation errors increases. Therefore, the winner's curse reflects the irrational behaviour of bidders who do not sufficiently discount the value of the target firm according to these two factors. Moreover, as noted by Thaler (1988), even some bidders might rationally behave in valuing target firms, others might not. Therefore, the winner's curse would typically be the case in most takeover contests.[7]

[7] de Bodt et al. (2018) note that as bidders must bid above the market value of a publicly traded target firm and that the market value would represent a baseline bid, the effect of the winner's curse still exists even when there is only one bidder.

Early studies provide experimental (e.g., Bazerman & Samuelson, 1983; Kagel & Levin, 1986) as well as empirical (e.g., Varaiya & Ferris, 1987; Varaiya, 1988; Giliberto & Varaiya, 1989) evidence for the existence of the winner's curse and that uncertainty about the target's value as well as competition between bidders increase the likelihood and/or the magnitude of overpayment.

Recently, McNichols and Stubben (2015) find that abnormal returns around the acquisition announcement for bidder shareholders are negatively associated with uncertainty about the true value of the target firm. Brander and Egan (2017) provide evidence of the existence of the winner's curse in M&A deals of privately held companies. They also report that the probability of the winner's curse increases with the increase in asymmetric information, competition, and managerial overconfidence. de Bodt et al. (2018) provide evidence supporting the existence of overbidding in takeovers, which is rooted by the existence of agency conflicts between bidder managers and shareholders and bidder managers' failure to fully consider the winner's curse.

2.4.2.1 Divergence of opinion

Miller (1977) theorises that heterogeneity in beliefs between investors upon the intrinsic value of a security, coupled with short-selling constraints, leads the security to be overpriced. That is, when there is a lower supply as a result of short-selling constraints, the market will reflect the opinion of most optimistic investors. Therefore, the higher the divergence of opinion among investors is, the higher the market price relative to fundamental is the security. He also argues that these overvalued securities will underperform in the long term when the market downward revises their values. Subsequent studies provide evidence consistent with Miller's theory. For instance, by proxying for the divergence of opinion by the change in the breadth of ownership, Chen et al. (2002) find that stocks with the highest level of divergence of opinion significantly underperform those with the lowest level over the long run. Similarly, Diether et al. (2002) find a negative association between analyst forecast dispersion, as a proxy for the divergence of opinion, and future returns.

Some studies test Miller's predictions in the takeover market context and examine whether the divergence of opinion among investors about the value of the bidding firm before the acquisition predicts abnormal returns around the deal announcement date or in the long term. In particular, Moeller et al. (2007) find a negative association between the

divergence of opinions among investors regarding the value of the bidding firm during the pre-acquisition period and announcement returns in only stock-financed acquisitions of public targets. Also, Alexandridis et al. (2007) find that bidders with high levels of pre-acquisition divergence of opinion experience lower abnormal returns in the long term and that this effect holds regardless of the method of payment or the public status of the target firm. Therefore, these studies provide evidence supporting Miller's predictions that the divergence of opinion among investors might reflect the overvaluation of the bidding firm and its underperformance in the future.

Rather than focusing on bidding firms, Chatterjee et al. (2012) examine whether the divergence of opinion among investors on the intrinsic values of target firms influence the takeover premium offered by acquiring firms. Using analyst forecast dispersion, change in the breadth of ownership, and stock volatility as proxies for the divergence of opinion, they find that the total takeover premium, the pre-announcement stock price run-up and the post-announcement stock price mark-up are positively associated with proxies of the divergence of opinion on the target's intrinsic value. They also show that although deals involving firms with high levels of pre-acquisition divergence of opinion generate larger synergies, they are less likely to receive bids. The results of Chatterjee et al. (2012) might indicate that high divergence of opinion among investors on the intrinsic value of the target firm leads bidders to have wide variations in estimating the true value of the target firm and, therefore, the winning acquirer is more likely to fall victim in the overpayment to target shareholders.

2.4.2.2 The hubris hypothesis or managerial optimism

Roll (1986) argues that managers of bidding firms overestimate takeover gains, if they exist at all, and, therefore, large premiums offered by bidders and the positive reaction of target share price (partly) reflect the wealth transfer from bidder shareholders to target shareholders. He hypothesises that hubris of bidder managers (hubris on managers' individual level) explains the manager's overestimation of the target's value and expected synergies. He also argues that market prices seem to reflect the rational behaviour of individuals, but this is on average (i.e., prices are averages). That is, there is no evidence that every individual rationally behaves as it is reflected by the average "rational" prices of the market. Additionally, if a market is completely populated by individuals whose behaviours are rational, the market's behaviour is observationally equivalent to the average behaviour of a market with individuals who irrationally behaves. That is,

irrational behaviours of individuals are cancelled out in the aggregate. Therefore, according to the hubris hypothesis, as takeovers reflect individual decisions, managers with hubris might not sufficiently consider the likelihood of valuation errors in the estimation of the target's value and expected synergies. Moreover, bidder managers believe that their valuation of the takeover transaction is correct; however, their valuation of the combined firm might not be correctly reflected by the market.

Roll's (1986) hubris hypothesis is not inconsistent with the market efficiency hypothesis, i.e., asset prices in financial markets reflect all relevant information, product markets are efficient, and mangers in the labour market are efficiently allocated. Therefore, he claims that the hubris hypothesis can play a benchmark for other explanations or hypotheses of the corporate takeover phenomenon that are mostly based on market inefficiencies. In addition, the hubris hypothesis does not rely on the basis that individual managers must consciously act against the interests of shareholders. That is, managers might believe they act in line with shareholders' interests, but hubris might lead individual managers to unconsciously act against shareholders' interests by their optimistic estimations of synergies and the value of the target firm. Thus, the hubris hypothesis and Jensen and Meckling's (1976) principal-agent conflict or agency theory do not coincide with each other.

As for the predictions of the hubris hypothesis for takeover gains, target shareholders would experience positive abnormal returns on the announcement of a deal, but these positive returns would be reversed when an initial bid is abandoned, and no other bids are announced. The opposite is true as for bidder shareholders who would experience negative (positive) abnormal returns on the announcement (abandon) of a deal. More importantly, the hubris hypothesis predicts that combined returns for both the target and the bidder are nonpositive.

Building on Roll's (1986) hubris hypothesis, Heaton (2002) develops a model linking managerial optimism to corporate investment decisions and shows that optimistic managers overestimate values of investments and, therefore, tend to overinvest in unprofitable investments, particularly when they have free cash flows. On the other hand, if they need external finance, optimistic managers tend to underinvest as they believe that the market undervalues their firms' securities.

Based on Roll (1986) and Heaton (2002) work, several studies provide evidence supporting the hubris hypothesis. For instance, Malmendier and Tate (2005) provide empirical evidence that the sensitivity between cash flows and investment decisions is

associated with CEOs overconfidence. They use CEOs' personal portfolios of stock and options to construct a measure of CEO's overconfidence that is based on the logic that overconfident CEOs are more likely to persistently fail to avoid their firm-specific risks by excessively holding their vested in-the-money stock options and not exercising them and habitually acquiring additional stocks of their firms. Specifically, they find that the sensitivity between cash flows and investment decisions is higher when the CEO is classified as overconfident.

As for takeover decisions, Malmendier and Tate (2008) examine whether CEO's overconfidence influences the takeover decision and the market reaction to the takeover announcement. They use two measures for overconfidence. The first is based on CEOs' personal portfolios of stock and options that reflects CEOs' own beliefs, and the second is based on the business press characterisation of CEOs that reflects outsiders' perceptions. They find that CEOs who are classified as overconfident are more likely to acquire other firms than their peers who are not overconfident. They also show that this effect is more pronounced when firms have abandoned internal financing sources and in diversifying deals. They also find that the market reaction around the announcement of deals is more negative when CEOs are overconfident, suggesting that overconfident CEOs destroy shareholder wealth by overpaying for target firms.

As overconfident managers overestimate their abilities and skills to generate returns and, therefore, overinvest and engage in complicated tasks, Doukas and Petmezas (2007) use high acquisitiveness as a proxy for managerial overconfidence, i.e., managers who make multiple acquisitions in a short period of time (five or more acquisitions within three years) are classified as overconfident. Using a sample of acquisitions of private firms in the UK, they show that managerial overconfidence is negatively associated with short- and long-run returns for bidder shareholders. They also find that the performance of high-order acquisitions (fifth or more within three years) is lower than the low-order acquisitions (first acquisitions). Therefore, they demonstrate that overconfidence is sourced by managers' self-attribution bias (i.e., managers who attribute initial successes to their own abilities become overconfident), and this bias induces them, subsequently, to make worse acquisitions.

There are other studies that provide evidence supporting the hubris hypothesis. For instance, Billett and Qian (2008) provide evidence of managerial overconfidence being sourced by self-attribution bias using a sample of acquisitions of public firms in the US. Ferris et al. (2013) use a sample of international M&As and show that CEOs

overconfidence is positively influenced by cultural traits (such as individualism), and that overconfident CEOs tend to make more offers, diversify by acquiring unrelated targets, and, consistent with their beliefs that the market undervalues their securities, use cash instead of stock in paying consideration. Aktas et al. (2016) focus on CEO narcissism and report that the market negatively reacts to CEO narcissism and that narcissistic CEOs tend to initiate deals. They also show that CEO narcissism influences the likelihood of deal completion and the future employment of target CEOs.

2.5 Determinants of takeover gains

Despite the above evidence on takeover gains and their distribution between target and bidder shareholders, the literature demonstrates that shareholders' wealth effect of corporate takeovers varies according to several factors that include characteristics of both the target and the bidder (for instance, firm size, firm public status, and firm misvaluation) and characteristics of the deal itself (such as, the method of payment, competition between bidders, and the relative size of the target to the bidder). Some of these determinants are discussed below in more detail.[8]

2.5.1 The public status of the target firm

The public status of the target firm (whether it is public, private, or subsidiary) represents an important determinant of shareholder wealth. Several studies show that while bidders earn significantly negative or zero abnormal returns around the announcement of M&A deals involving public target firms, bidders earn significantly positive abnormal returns around the announcement of deals involving private target firms or subsidiaries (e.g., Chang, 1998; Fuller et al., 2002; Draper & Paudyal, 2006; Faccio et al., 2006). For instance, Fuller et al. (2002) examine abnormal returns for shareholders of acquiring firms who made five acquisitions or more within three-year period. This setting allows them to attribute any variations in abnormal returns of the acquirer and the choice of the method of payment between these acquisitions to the variation in characteristics of the target or the deal and not the acquirer itself. They show that abnormal returns around the deal announcement date for acquirer shareholders are positive in deals involving acquiring private firms or subsidiaries but negative in deals involving acquiring public firms,

[8] For a survey for the wide evidence on determinants of takeover gains, see, for example, Golubov et al. (2013) and Renneboog and Vansteenkiste (2019).

suggesting the effect of the public status of the target on acquirer returns. They interpret this in light of the liquidity discount effect in deals of private firms or subsidiaries that lowers the price of the target and, therefore, increases acquirer returns.

2.5.2 Method of payment

Another important factor for takeover gains that has been widely addressed in the literature is whether the method used to pay the deal consideration is cash, stock, or a mix of cash and stock. The evidence shows that abnormal returns for target shareholders are significantly higher when cash is used than stock in paying the deal consideration (Wansley et al., 1983; Huang & Walkling, 1987). As for bidder returns, prior studies demonstrate that abnormal returns for bidder shareholders around the deal announcement are significantly negative in stock-financed offers but positive or equal to zero in cash-financed offers (e.g., Travlos, 1987; Chemmanur et al., 2009). The literature typically interprets the differential effect of different methods of payment on bidder returns in accordance with the signalling hypothesis or the adverse selection framework of Myers and Majluf (1984). The theory suggests that bidder managers would prefer to use stock (cash) in paying the deal consideration if they think that the firm's stock is overvalued (undervalued) and that the market is aware of this behaviour and, therefore, shareholders negatively react to the announcement of stock-financed offers.

However, the literature shows that the impact of the method of payment on bidder returns varies according to the public status of the target firm (i.e., public, private, or subsidiary). Prior studies find that positive (negative or zero) bidder returns in deals of private (public) targets are greatest when stock is used as a payment method (Chang, 1998; Fuller et al., 2002). Thus, deals could be descendingly ordered in terms of their profitability to acquirer shareholders from stock-financed acquisitions of private targets and subsidiaries as the best, then cash-financed acquisitions of private targets and subsidiaries, then cash-financed acquisitions of public targets, and finally stock-financed acquisitions of public targets as the worst. Fuller et al. (2002) interpret the effect of using stock in accordance with theoretical predictions of both Myers and Majluf (1984) that using stock as a payment method is perceived by the market as the acquirer is overvalued; therefore, the negative impact of acquiring public targets will be prominent in stock offers, as well as Hansen (1987) that acquirers use stock to share risk with target shareholders when asymmetric information about the target is high, as in private firms and subsidiaries. As private targets typically have concentrated ownership, Chang (1998),

however, interprets the positive effect of using stock on bidder returns in acquisitions of private targets as the market values the monitoring role of large blockholders transferring from the private target to the combined firm in stock-financed offers.

2.5.3 Firm size

The size of the target or the bidder is found to influence takeover gains. Moeller et al. (2004) find that abnormal returns for shareholders of small bidders are significantly higher than of large bidders. This negative association between bidder size and bidder returns may indicate that the market reaction is affected by the higher likelihood of agency conflicts as well as managers' vulnerability for overconfidence and hubris in large firms. As for the target size, Schwert (2000) report a negative association between target returns and target size. Alexandridis et al. (2013) find that the takeover premium is significantly lower in deals of large targets. They also find that the likelihood of overpayment by acquirers is lower in these deals. Despite the lower premium incurred by acquirers in large deals, they report a significant negative association between returns for bidder shareholders and target firm size. They interpret these relations in light of the effect of higher complexity inherent in large target firms and its link to the subsequent difficulties and costs of integration with these firms on the expected synergies. Moreover, supporting the complexity hypothesis, they show that the negative relation between the relative size of the target to the bidder and returns to shareholders of the acquirer documented by Fuller et al. (2002) as well as the negative association between bidder size and bidder returns reported by Moeller et al. (2004) is primarily driven by the target size effect as these associations are only significant in deals involving large targets.

2.5.4 Acquisition method

Another factor that is addressed in the literature as a determinant of takeover gains is the acquisition method or the form of the deal (e.g., Harris & Raviv, 1988; Berkovitch & Khanna, 1991; Schnitzer, 1996; Betton et al., 2008; Offenberg & Pirinsky, 2015). One primary classification of acquisition methods is that between tender offers and mergers. Tender offers are deals in which bidders bypass the target's board of directors by offering a price directly to target shareholders who have the discretion to accept the offer or not. Therefore, a tender offer is considered as a tool for a hostile takeover, in which target managers resist the deal. On the other hand, bidders in mergers negotiate first a deal with

the target's board of directors and then, if agreed, target shareholder vote to accept the deal or not.

Prior studies show that the takeover premium is higher in tender offers compared to mergers, the speed of completing tenders offers is faster than mergers, and bidder returns are significantly negative (insignificantly positive) in mergers (tender offers) (e.g., Schwert, 1996; Betton et al., 2008). Offenberg and Pirinsky (2015) propose a new theory for the bidder's choice between mergers and tender offers by developing a model for the trade-off between tender offers' potential advantages and disadvantages for bidders. Advantages may include fast deal completion, which might be of more importance to bidders if the deal is strategic for them and if the likelihood that other bidders compete is high. However, tender offers may signal for the high demand for the target's stock and, therefore, raises the takeover premium. Offenberg and Pirinsky (2015) provide empirical evidence supporting their theoretical model. In particular, despite the longer pre-announcement due diligence period bidders spend in tender offers than in mergers, they report that the speed in completing tender offers is higher than mergers by 73 days. They also find that the likelihood of forming the deal in a tender offer increases with increasing the takeover competition (by the existence of competing bids and being the deal initiated by the bidder) and the strategic importance of the deal to the bidder (as reflected by bidder's prior investments in the target). Further, they demonstrate that competing bidders in tender offers experience negative and significantly lower announcement returns as well as lower post-announcement operating performance than those competing in mergers.

2.5.5 Competition between bidders

Prior studies show that the competition between bidders to get control over the target influence takeover dynamics and outcomes. Competition is usually measured by the existence of more than one bidder in the takeover contest. It is worth noting that the effect of competition on takeover gains might not be straightforward when addressing initial bids as the effect would be captured for the subsequent bids (i.e., the existence of rival bids). Generally, prior studies demonstrate that competition between bidders increases the takeover premium and, therefore, benefit target shareholders at the expense of bidder shareholders. For instance, Varaiya (1988) shows that as the number of bidders increases (i.e., more competition), the variance of bidders' estimates of the target's true value increases and, therefore, the likelihood of overpayment by the winning acquirer increases. Bradley et al. (1988) also find that the competition between bidders benefits target

shareholders at the expense of bidder shareholders. Giliberto and Varaiya (1989) find that bidders do not consider decreasing their bids with the increase in competition between bidders. Using a global data set, Alexandridis et al. (2010) report that acquirers pay lower premiums and earn positive returns in deals involving targets in less competitive takeover markets. They also find that shareholders of targets in these less competitive markets earn lower positive returns, arguing that takeover gains are more evenly distributed between shareholders of both the target and the acquirer.

2.5.6 Foreignness of the bidder

Eckbo and Thorburn (2000) examine whether abnormal returns for bidding firms differ when the bidding firm is a domestic or a foreign firm. Using a large sample of acquisitions of Canadian targets, they find that domestic bidders (i.e., Canadian) achieve significantly positive abnormal announcement returns while foreign bidders (from the U.S.) achieve zero abnormal returns. They also show that the positive returns for domestic bidders are greatest when bidders use stock as a payment method, which contrasts with the prediction of Myers and Majluf (1984) adverse selection hypothesis in equity issues, and when the relative size of the bidder to the target is smallest.

2.5.7 Other factors

There are several other factors that prior studies show that they influence takeover dynamics and outcomes. Examples of these factors include the relative size of the target to the bidder (Fuller et al., 2002), stock price run-up (Schwert, 1996); hostility of the deal (Schwert, 2000), firm market misvaluation (Dong et al., 2006; Akbulut, 2013); industry, product market and human capital relatedness (Schoar, 2002; Fan & Goyal, 2006; Lee et al., 2018); CEOs' overconfidence and narcissism (Doukas & Petmezas, 2007; Billett & Qian, 2008; Malmendier & Tate, 2008; Aktas et al., 2016); CEOs compensation and incentives (Datta et al., 2001; Phan, 2014; Feito-Ruiz & Renneboog, 2017); CEOs' and board of directors' professional and social networks and connections (Cai & Sevilir, 2012; Ishii & Xuan, 2014; El-Khatib et al., 2015); ownership structure (Wright et al., 2002; Gaspar et al., 2005); cross-ownership (Matvos & Ostrovsky, 2008; Harford et al., 2011; Brooks et al., 2018); and shareholder voting and activism (Becht et al., 2016; Boyson et al., 2017).

2.6 The event study methodology in M&A research

The event study methodology is firstly introduced by Fama et al. (1969). This methodology is primarily employed for two purposes: (1) testing the hypothesis that security prices accurately incorporate all publicly available information (i.e., the efficient market hypothesis)[9] and (2) assuming the efficiency of the market, testing the impact of an announcement or an event on the wealth of firms' shareholders. This methodology has become the standard method in measuring the reaction of stock prices to events or announcements such as earnings announcements, changes in accounting and economic regulations and policies, announcements of mergers and acquisitions, initial public offerings, and seasoned equity offerings, among others.

In their study, Fama et al. (1969) develop the event study methodology to examine the impact of announcing stock splits in a specific month on firms' stock prices. To capture the "abnormal" behaviour of the stock price, they control for normal changes in the firm's returns by subtracting the firm's normal returns from its actual returns in the month of announcing the stock split. In order to estimate the firm's normal returns, they regress the firm's monthly returns on market returns (using a market-wide index) and use obtained parameters from this regression to get predicted values of the firm's returns (i.e., normal returns). Specifically, for each firm, they estimate the following "market model" using an event window spanning from 29 months before to 30 months after the month of announcing the stock split (month 0):

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}.$$

where $R_{i,t}$ is the actual return for firm i and month t and $R_{m,t}$ is the market return in month t. Fama et al. (1969) use residuals of month 0 (i.e., $\varepsilon_{i,0}$) as the estimation of abnormal returns for the firm i in the month of announcing the stock split. This methodology, therefore, controls for the economy-wide effects on the firm's returns and captures abnormal returns, as reflected in residuals of the market model, associated with firm-specific information that includes the new announcement or event at a particular time.

To avoid concerns about the stationarity of parameters, the literature shows that when estimating normal returns, it is advised to use a sufficiently long period (for example, five to seven years when using monthly returns and 200 to 250 trading days when using daily returns). In addition, parameters of the market model should be

[9] See Fama (1991) for a review of the literature about the market efficiency.

estimated over an estimation period that does not overlap with the event window. That is, if the event period is included in the estimation period, estimated parameters would be biased because of the effect of the new information during the event window. Therefore, if the event window is month z, the estimation window could be, for instance, the sixty-month period preceding month z.

The notion behind measuring abnormal returns of a security in response to a specific announcement or event is to capture the deviation of the actual stock performance during the event window from the normal or expected stock performance that is considered as a benchmark. Several techniques of estimating normal or expected returns and, therefore, abnormal returns have been used in the literature. The most common techniques include the mean-adjusted model, the market-adjusted model, and the market model.[10, 11]

2.6.1 The mean-adjusted model

According to the mean-adjusted model, the normal or expected stock return is calculated as the average of the stock own returns over an estimation window as follows:

$$Average\_R_i = \frac{\sum_{t=1}^{T} R_{i,t}}{T}$$, over the estimation period.

Then, the average (normal) return is subtracted from the actual stock return in the event window to obtain the abnormal return:

$$Abnormal\_R_{i,t} = R_{i,t} - Average\_R_i$$, over the event window.

Although this method is simple and does not require data for returns of a market-wide index, it does not explicitly control for the event-window market returns and, thus, might be vulnerable to biased estimations. It also assumes that firm normal returns are constant.

[10] Other techniques for estimating normal returns include the use of a one-factor or a multifactor CAPM model. See Binder (1998) for more detail.

[11] For a detailed presentation and a survey of the literature of the event study methodology see, for example, Brown and Warner (1985), Peterson (1989), Binder (1998) and Kothari and Warner (2007).

2.6.2 The market-adjusted model

As for the market-adjusted model, the market return during the event window is used as the normal or expected return that is directly subtracted from the actual firm's return to calculate the abnormal return as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - R_{m,t}, \text{ over the event window.}$$

This method is also simple and its estimates of abnormal returns are likely to be less biased than estimates of the mean-adjusted model when large samples are used and when assuming the market model provides the correct estimates (Binder, 1998).

2.6.3 The market model

As discussed above, when using the market model, parameters of the relation between firm returns and market returns are firstly estimated over an estimation window, typically preceding the event window and using least squares regression, as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}, \text{ over the estimation window.}$$

Then, with the assumption that coefficients of the relation between firm returns and market returns are constant during both the estimation and the event windows, using market returns during the event window and estimated coefficients of the market model, normal returns during the event window are estimated as follows:

$$Normal\_R_{i,t} = \alpha_i + \beta_i R_{m,t}, \text{ over the event window.}$$

The deviation of actual returns from estimated normal returns during the event window is used as the estimation of abnormal returns as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - Normal\_R_{i,t}, \text{ over the event window.}$$

The primary advantage of the market model is the control of the market return movement or the risk of the stock during the event window.

2.7 Summary

After targeting a specific firm, the acquiring firm begins its review of this target, which is called the due diligence process. This review usually goes through three stages. The first stage is based on reviewing the target firm based on publicly available information. Then, if the target and the acquirer agree to negotiate a deal, the acquirer signs a confidentiality agreement, by which the acquirer gets access to some private information about the target. If a deal is agreed upon, an acquisition agreement is signed and publicly announced and, consequently, the acquirer gains access to more private information about the target.

M&A transactions are typically viewed as value-creating transactions for shareholders of the target firm. The empirical evidence shows that target shareholders, on average, receive large premiums and earn large abnormal returns upon the announcement of M&A transactions. However, the literature provides evidence that these transactions are value-destroying or value-neutral for shareholders of the acquiring firm. Therefore, it is argued that acquiring firms might overpay to target firms. Two main theories are proposed to interpret the value-effect of M&A transactions: the principal-agent conflict and the winner's curse.

Despite the above-mentioned evidence regarding the positive (negative) effect of M&A transactions on shareholder wealth of the target (acquiring) firm, prior studies show that there are several factors that might drive the effects of M&A transactions on shareholder wealth and other outcomes of M&As. These factors include the public status of the target firm (i.e., public, private or subsidiary), the method used to pay consideration of the deal (i.e., cash, stock or a mix of cash and stock), sizes of firms participating in the deal, the acquisition method (i.e., mergers or tender offers), among many other factors.

As M&A transaction represents an event that occurs at a particular time, the methodology typically employed in M&A research is the event-study methodology. The notion behind this methodology is that it captures abnormal changes in stock prices of the target or the acquirer over an event window that includes the date of announcing the M&A transaction. By estimating and controlling for normal or predicted returns, it gauges abnormal returns during the event window that would be due to the new information included in the announcement of the M&A transaction.

Chapter 3

Target's information asymmetry and merger outcomes

3.1 Introduction

Prior literature shows that M&A transactions are, in general, value-decreasing or value-neutral for shareholders of acquiring firms; however, shareholders of target firms typically receive large premiums and achieve large positive abnormal stock returns upon the announcement of M&A transactions (e.g., Bradley et al., 1988; Mulherin & Boone, 2000; Moeller et al., 2005; Eckbo, 2009). It has been argued for a long time that this effect on shareholder wealth of both the target and the acquirer is due to the acquirer's overpayment to target shareholders (e.g., Black, 1988; Morck et al., 1990; Eccles et al., 1999; Hietala et al., 2002; Harford et al., 2012; de Bodt et al., 2018). That is, the acquirer overestimates the true value of the target firm and the expected synergies from the transaction. This overpayment is interpreted by the literature as evidence of the agency conflicts between managers and shareholders of the acquiring firm (such as empire building) (e.g., Jensen & Meckling, 1976; Jensen, 1986; Morck et al., 1990) and/or the winner's curse (including behavioural biases) (e.g., Roll, 1986; Thaler, 1988; Malmendier & Tate, 2008).

A growing stream of research focuses on how information asymmetry of the target firm influences decisions of bidding firms as well as deal dynamics and outcomes (Officer et al., 2009; Raman et al., 2013; Skaife & Wangerin, 2013; Amel-Zadeh & Zhang, 2015; Dionne et al., 2015; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Cheng et al., 2016; Martin & Shalev, 2017; Li & Tong, 2018; Borochin et al., 2019). However, evidence of this research regarding the effect of a target's information asymmetry on shareholder wealth of the bidding firm is mixed. On the one hand, based on the acquirer's overpayment due to the agency conflicts and/or the winner's curse explanation, some studies show that the target's information asymmetry increases the difficulty that bidders encounter in estimating the true value of the target firm and the expected synergies and, thus, makes bidders incur large premiums and negatively affect bidders' shareholder wealth. For instance, Dionne et al. (2015) find that better-informed bidders, as proxied by

deals undertaken by targets' blockholders, pay much lower premiums than less informed bidders, suggesting that bidders who are less vulnerable to the asymmetric uncertainty over the target's value are less likely to fall victims in the overpayment problem. McNichols and Stubben (2015) find that uncertainty about the target firm leads to decreasing acquirer returns around the announcement of M&A transactions. They also show that target's high quality of accounting makes the acquirer's valuation of the target firm more accurate and, therefore, increasing the acquisition profitability for acquirers.

On the other hand, some studies argue that large premiums offered by bidders to target firms with high ex ante information asymmetry are indicators for the discounted values of these targets in the stock market (Cheng et al., 2016; Li & Tong, 2018; Borochin et al., 2019). That is, as investors discount the value of equities with high information asymmetry (e.g., Glosten & Milgrom, 1985; Hertzel & Smith, 1993; O'Hara, 2003), bidders respond to this value-discounting by offering smaller discounts for opaque targets as an opportunity for a bargain. Importantly, these studies show that bidder shareholders earn higher returns upon the announcement of M&A deals involving target firms with high information asymmetry. Moreover, Cheng et al. (2016) find that the post-acquisition operating performance of bidding firms is better in these deals.

The mixed evidence and interpretations regarding the effect of a target's information asymmetry on shareholder wealth of the bidding firm could be due to the use of different proxies for a target's information asymmetry, which is an unobservable construct and/or the use of different sample sizes. Therefore, this study firstly attempts to disentangle this mixed evidence by using (1) three proxies for information asymmetry that capture the informational advantage of the target's managers over the market (namely, the target's idiosyncratic stock return volatility, bid-ask spread, and research and development (R&D) intensity) and (2) a large sample of 3,789 M&A deals between U.S. publicly traded firms announced over the period 1986-2017. In particular, this study examines the impact of the target's ex ante information asymmetry on the takeover premium offered by the bidder to target shareholders as well as the market reaction of the target, the bidder, and the portfolio of the target and the bidder to the announcement of the M&A transaction.

This study finds that the target's information asymmetry is positively associated with the takeover premium, suggesting that takeover premiums offered by bidders are higher in M&A deals involving target firms with high information asymmetry. Further, the results show that the target's information asymmetry is positively associated with

target announcement returns and negatively associated with acquirer as well as combined announcement returns, indicating that while the target's information asymmetry increases the profitability of M&A deals for shareholders of the target firm, it decreases the wealth of shareholders of the bidding firm and the total efficiency of the deal.

In terms of the economic significance, the increase in the target's information asymmetry, as proxied by stock return volatility, for example, from the bottom decile to the top decile is associated with an increase in the takeover premium of 2,290 basis points (approximately constituting 54% of the sample average premium), an increase in target announcement returns of 850 basis points (equivalent to 39% of the sample mean target announcement returns), and a decrease in acquirer announcement returns of 180 basis points (equivalent to 138% of the sample mean acquirer announcement returns). Therefore, the results are economically significant.

Thus, the results connote that the target's information asymmetry might increase the difficulty of accurately estimating the true value of the target firm, which would increase the divergence between bidders in estimating this value and, consequently, the possibility that the winning bidder overpays for the target firm. Moreover, the results suggest that large payments in deals involving target firms with high information asymmetry are positively (negatively) perceived by target (bidder) shareholders and negatively influence the total efficiency of deals.

Next, although prior studies have examined the impact of a target's information asymmetry on shareholder wealth, it is unknown whether a target's information asymmetry affects the ultimate deal outcome (i.e., being completed or terminated) as well as the deal dynamics (namely, being renegotiated or not). This study argues that by getting access to private information during the transactional due diligence after the deal announcement, bidders are more likely to discover material adverse risks in deals involving target firms with high information asymmetry. This, in turn, would induce bidders to withdraw their offers or to renegotiate their initial offer prices. Accordingly, this study conjectures that bidders who initially overestimate the true values of target firms might decide to terminate these deals or, alternatively, consummate the deals but after downward renegotiating their initial offer prices.

Consistent with expectations, the results reveal that the target's information asymmetry is positively associated with the likelihood of the deal termination. Moreover, given the deal is completed, the target's information asymmetry is positively associated with the likelihood of the downward renegotiation of the initial deal price. These results

suggest that bidders are more likely to terminate deals that involve target firms with high ex ante information asymmetry, arguably because of the prior overestimation of the true values of target firms. Furthermore, bidders are more likely to downward renegotiate their initial offer prices in deals involving target firms with high information asymmetry, which might indicate that bidders attempt to mitigate the adverse effects of the target's information asymmetry that would be figured out during the post-announcement transactional due diligence stage.

Finally, this study explores the effect of the target's information asymmetry on the acquirer's long-term performance by examining whether the target's information asymmetry is associated with the likelihood of the acquirer's post-acquisition reporting of goodwill impairment losses. If large premiums and lower acquirer and combined announcement returns in deals involving target firms with high ex ante information asymmetry indicate an overestimation of these target firms, it is predicted that the likelihood of the acquirer's post-acquisition reporting of goodwill impairments to be higher in these deals. Consistent with this prediction, this study finds that acquirers are more likely to subsequently report goodwill impairment losses when target firms have high information asymmetry. Thus, consistent with the adverse consequences of the target's information asymmetry on the acquirer's short-term market performance, this study sheds light on the negative effect of the target's information asymmetry on the long-term performance of acquirers.

The results of this study are robust to several sensitivity analyses. First, the results of the takeover premium are robust to the exclusion of deals with abnormally high or low premiums as well as to the use of different measures of the takeover premium. Second, the results of the market reaction to M&A announcements are insensitive to the use of a different event window as well as to the use of the market-adjusted model when estimating abnormal announcement returns for targets, acquirers, and portfolios of targets and acquirers. Third, the results of the takeover premium and the market reaction to M&A announcements are insensitive to the use of a sample of only completed deals (i.e., after excluding terminated deals). Fourth, the results of this study are robust to the use of different specifications of the proxies of a target's information asymmetry. Fifth, the results are robust to controlling for additional variables, which mitigate concerns about endogeneity arising from correlated omitted variables, including target-firm industry fixed effects and acquirer firm-specific characteristics. Last, the results are insensitive to the exclusion of target firms with negative equity values.

Furthermore, this study provides assurance that the positive association between the target's information asymmetry and the takeover premium is not driven by the probable discounted value of the target firm. This study attempts to rule out this alternative explanation by examining whether the association between the target's information asymmetry and the takeover premium differs cross-sectionally based on the target's pre-acquisition valuation. By splitting the entire sample of target firms into two subsamples based on the target's Tobin's Q or market-to-book (MTB) ratios, this study finds that the association between the target's information asymmetry and the takeover premium does not differ for subsamples of target firms with high versus low pre-acquisition valuations. Moreover, the explanation of the target's discounted value would not confound the interpretation of the results of this study regarding the effects of the target's information asymmetry on acquirer announcement returns, combined announcement returns, the likelihood of the deal termination, the likelihood of the downward renegotiation of the initial deal price, and the likelihood of the acquirer post-acquisition reporting of goodwill impairment.

This study contributes to the literature in three main ways. First, this study disentangles the mixed results and interpretations in prior literature regarding the effects of the target's ex ante information asymmetry on the acquirer's shareholder wealth and provides evidence that is in favour of the acquirer's overpayment explanation in the M&A market. This study finds that the takeover premiums offered by acquiring firms are higher in transactions involving target firms with high information asymmetry. More importantly, consistent with the evidence in Dionne et al. (2015) and McNichols and Stubben (2015) and in contrast to Cheng et al. (2016) and Borochin et al. (2019), this study finds strong evidence that the target's information asymmetry negatively affects shareholder wealth of acquiring firms around the announcement of M&A transactions, suggesting that shareholders perceive these deals as less profitable. Moreover, this study finds that combined announcement returns of portfolios of targets and acquirers are lower in deals involving target firms with high information asymmetry.

Second, this study adds to the growing research stream addressing the effects of uncertainty, at the macro level, on the M&A activity and outcomes (e.g., Bhagwat et al., 2016; Nguyen & Phan, 2017; Bonaime et al., 2018; Cao et al., 2019). These studies provide evidence that policy uncertainty decreases the value and volume of M&A both on the macro- and firm-levels. They also show that policy uncertainty increases the likelihood of deal termination and renegotiation. Differently from these studies, this study

focuses on uncertainty at the firm-level and provides evidence that the target's information asymmetry affects the investment decisions of acquiring firms and the dynamics of M&A deals. In particular, this study finds that the target's information asymmetry increases the likelihood of terminating the deal. Furthermore, given the deal is completed, the likelihood of the downward renegotiation of the initial deal price is higher when target firms have high ex ante information asymmetry. This study also extends the evidence in Skaife and Wangerin (2013) and Amel-Zadeh and Zhang (2015) that the target's low accounting quality increases the likelihood of the deal termination.

Third, this study relates to recent studies that show that bidders overbid in M&A transactions (de Bodt et al., 2018) and that winning bidders underperform after M&A transactions (Malmendier et al., 2018). Despite the evidence that bidders are more likely to terminate deals or renegotiate the initial offer prices of deals involving target firms with high information asymmetry, which might indicate the rational behaviour of some bidders in response to the target's information asymmetry, this study argues that winning bidders are more likely to have overestimated target values, due to principal-agent conflicts or winner's curse/behavioural biases, and that the target's information asymmetry increases this risk of overestimation. Consistent with this argument, this study finds that bidders in deals involving target firms with high ex ante information asymmetry are more likely to subsequently report goodwill impairment losses, suggesting that bidders who decide to consummate deals involving opaque targets subsequently underperform. This long-term negative effect on the acquirer's performance is also consistent with the result of this study of the lower acquirer short-term market performance around the announcement of M&A transactions involving target firms with high information asymmetry.

The remainder of this chapter proceeds as follows. Sections 2 and 3 review the literature and develop research hypotheses, respectively. Section 4 demonstrates the research design, including measures of variables and the empirical model. Sample selection and descriptive statistics are described in section 5. Sections 6 and 7 present empirical results and robustness tests, respectively. An alternative explanation is addressed in section 8. Section 9 concludes.

3.2 Literature review

Roychowdhury et al. (2019) demonstrate that there are two main sources of the total uncertainty associated with the investment decision. The first source is the information asymmetry between firm managers and various stakeholders, primarily including external capital providers, such as shareholders and creditors, that might raise adverse selection and moral hazard problems and, therefore, increase agency costs.[12] That is, information asymmetry might induce managers to hide bad news from shareholders and creditors when raising external capital and/or invest in projects with negative net present values but generate utilities for themselves and, consequently, leading to adverse selection and/or moral hazard problems (Jensen & Meckling, 1976; Myers & Majluf, 1984).

The second source of the total uncertainty associated with an investment decision is the uncertainty about investment opportunities themselves regardless of the existence or absence of information asymmetry and agency conflicts among various stakeholders. That is, even in a frictionless world such as in Modigliani and Miller's (1958) model, the payoffs from investment opportunities in current and future periods are not certain to managers and investors. In their discussion of Roychowdhury et al.'s (2019) review study, Ferracuti and Stubben (2019) decompose uncertainty about investment opportunities, in turn, into two components: fundamental uncertainty and information uncertainty. While fundamental uncertainty cannot be resolved by gathering more information as they are associated with the underlying economic nature of investment opportunities, information uncertainty can be reduced by gathering additional information.

In the context of mergers and acquisitions, one can think of uncertainty about investment opportunities (the second source of the total uncertainty explained above) as uncertainty bidders face about the true value of target firms and, consequently, the expected synergies from acquisitions. Consistent with Ferracuti and Stubben (2019), this uncertainty could be classified into (a) fundamental uncertainty and (b) information uncertainty. Similarly, Rogo (2009) decomposes valuation uncertainty confronting bidders about the target firm into symmetric uncertainty and asymmetric uncertainty. Symmetric uncertainty reflects the target's inherent business or business-specific

[12] Although adverse selection and moral hazard are different issues, the distinction between them is not straightforward, at least empirically. Adverse selection could be seen as the consequences of information asymmetry *before* raising external capital needed for investments while moral hazard refers to the consequences of information asymmetry on managers' investment decisions *after* raising external capital (Roychowdhury et al., 2019).

uncertainty that both target insiders and outsiders, including bidders, equally face. On the other hand, asymmetric uncertainty reflects uncertainty arising from the target's private information that target managers have but not outsiders. Rogo (2009) decomposes asymmetric uncertainty, in turn, based on the reasons for withholding private information by target managers into two sub-components: proprietary and non-proprietary. Asymmetric uncertainty arising from proprietary information is uncertainty resulting from bidder's lack of knowledge about target's proprietary private information withheld by target managers such as information about know-how and competitive advantages. However, asymmetric uncertainty arising from non-proprietary information is uncertainty originated from the target's non-proprietary private information withheld by target managers, probably because of agency conflicts such as bad news opportunistically withheld by managers to achieve private benefits.

This indicates that information uncertainty about the true value of the target firm arises from the incomplete information about the target firm that could be due to the target's high information asymmetry and the less information gathered by bidders about target firms. This is consistent with McNichols and Stubben (2015), who note that the target's information asymmetry is not the only source of uncertainty about the true value of the target firm and that there are other additional general information uncertainties that might comprise the overall uncertainty about the target value. This information uncertainty leads bidders to depend on expectations regarding information they are not able to directly observe (Rogo, 2009).

Prior studies have addressed how bidders respond to the uncertainty about the target value arising from information asymmetry in M&A transactions. The early equilibrium analysis by Hansen (1987) addresses whether the target's information asymmetry affects bidder's rational decisions in response to this information uncertainty. Hansen (1987) theorises that the decision to choose between cash and stock as methods of payment in M&A transactions is associated with the target's information asymmetry and its related adverse selection risk. By considering the process of an acquisition transaction as a bargaining game between two agents under imperfect information, he shows that acquiring firms prefer to use stock in deals involving targets who know their own true values better than acquirers do. As the target will not accept the deal unless the offer is higher than its value, the acquirer might face a "lemons" problem in deals involving target firms with high information asymmetry if the deal consideration is paid in cash. Therefore, to protect themselves against the risk that the target is a "lemon",

acquirers use stock to pay for target firms as stock has a contingent-pricing advantage compared to cash. In a stock offer, if the acquirer overpays for a "lemon" target, both the acquirer and target shareholders will share any ex post losses in the stock price of the merged entity arising from that overpayment.

Recently, Eckbo et al. (2018) question the longstanding explanation of bidder opportunism for using stock as a method of payment in M&A transactions. They examine whether the use of stock as a payment method reflects bidder opportunism, as documented in the literature, or it reflects the classical alternative explanation of using stock in deal payment, i.e., the rational payment design as in Hansen (1987). The previous literature documenting the negative effect of using stock as a payment method on bidder announcement returns usually relies on the revelation effect of issuing stock in interpreting this relation. That is, consistent with the adverse selection predictions of Myers and Majluf (1984), bidder managers tend to use stock to pay for target shareholders only when they believe that their stocks are overvalued and that the market realises this managers' opportunistic behaviour (i.e., the adverse selection on the bidder side) and negatively reacts to the announcements of stock-financed acquisitions.[13] According to the rational payment design explanation, on the other hand, bidders who are concerned about the target's information asymmetry and its related adverse selection risk prefer to use stock to protect themselves against the potential adverse consequences of the target's information asymmetry as stock payment has the advantage of making target shareholders share the risk of overpayment caused by the adverse selection on the side of the target firm.

Unlike most prior studies examining bidder opportunism by relying on proxies of market mispricing of bidders, such as market-to-book (MTB) ratios, Eckbo et al. (2018) depend on proxies for the informativeness of target firms about bidding firms and their fundamental values (i.e., the target's skills in accurately valuing the bidder). These proxies include the degree of industry complementarity, the geographical proximity and location of both the target and the bidder, whether the bidder had a recent event that increased the public valuation-related information about the bidder (such as a recent seasoned equity offer or an acquisition), whether both the bidder and the target belong to the same four-digit SIC, and return correlation, among others. They argue that more informed targets about bidders are more likely to capture, if any, overvaluation of bidder's

[13] The theoretical basis for the adverse selection explanation is introduced by Myers and Majluf (1984) in the context of equity issuance and then supported by several studies in the context of mergers and acquisitions such as Travlos (1987) and Amihud et al. (1990).

stock, and this, in turn, leads to a lower likelihood of using stock by overvalued bidders with opportunistic incentives. At the same time, however, these informed targets (i.e., targets with greater skills to accurately value the bidder) are less likely to undervalue bidder stock. Therefore, they hypothesise that if deals involving more informed targets about the bidder and its fundamental value are more likely to be financed by stock, this indicates that bidders use stock as a rational payment design and not in an opportunistic way. On the other hand, if the likelihood of using stock or the fraction of stock in deal payment is low when targets are informed about bidders and can capture overvaluation of bidder stock, this indicates that bidders use stock opportunistically.

Consistent with the rational design payment hypothesis and against bidder opportunism hypothesis, Eckbo et al. (2018) find that bidders systematically use stock as a payment method in deals involving more informed targets. They also question the evidence in the literature that bidders with high MTB ratios are more likely to use stock as an indication for bidder opportunism. They examine whether an exogenous variation in bidder's MTB ratio (namely, the large outflows by mutual funds holding shares in the bidding firm) influences the use of stock. As prior studies show that large outflows by mutual funds holding shares in the firm represent pressure on the firm's stock price and negatively affect prices, they argue that this exogenous price pressure would reduce market pricing errors of bidding firms, if any, and, consequently, narrow the scope for bidders to opportunistically use stock and, in turn, reduce their incentives to use stock as a payment method. They find no evidence supporting this argument and that the use of stock in deal payment is statistically independent of the exogenous variation in the bidder's MTB ratio (i.e., the price pressure caused by large outflows by mutual funds). Moreover, they also find that external pressure on public bidders to pay in cash (as represented in targets that are usually paid in cash, targets that are labelled as cash-only sellers, and the high competition from private bidders who usually pay in cash) reduces the fraction of stock used in deal payment.

The literature has also addressed the effects of a target's information asymmetry on other merger dynamics and outcomes. Consistent with the predictions of Hansen (1987) and the evidence in Eckbo et al. (2018), Officer et al. (2009) find that acquirers are more likely to use stock in deal payment when target firms are difficult to value (i.e., have higher levels of information asymmetry), arguing that the use of stock mitigates the adverse consequences of uncertainty about the target value. Moreover, they reveal that acquirers' returns are better when they use stock in deals involving difficult-to-value

targets, suggesting the positive signalling impact of using stock in these deals. Using bids offered by the target's blockholders as a proxy for deals with more informed bidders about the target's value, Dionne et al. (2015) examine the impact of information asymmetry amongst bidders about the true value of the target firm on premiums they offer. They find that more informed bidders pay lower premiums compared to other bidders, suggesting that bidders who are less influenced by information uncertainty about the target's true value bid more effectively in the market for corporate control and are less likely to overpay to target shareholders.

Amel-Zadeh and Zhang (2015) examine the effect of financial restatements by target firms on the dynamics and outcomes of mergers and acquisitions. They find that target firms with financial restatements are less likely to receive bids than target firms without restatements. They also find a negative effect of financial restatements by target firms on the likelihood of the deal completion and that deals involving restating targets take longer periods of time for completion. Further, they show that financial restatements by target firms negatively influence value multiples of the deal, suggesting that target-firm financial restatement, as a signal for information risk, influences bidder's decisions and deal outcomes. McNichols and Stubben (2015) find that uncertainty about the target firm leads to decreasing acquirer returns around the acquisition announcement date. In addition, after controlling for uncertainty, they find that acquirers gain higher returns around acquisition announcements when target firms have a higher quality of accounting. They argue that the target's high quality of accounting makes the acquirer's valuation of the target more accurate and, therefore, acquirers make more profitable acquisition decisions.

The discussion above suggests that information asymmetry of the target firm may induce bidders to protect themselves against the potential overpayment in corporate takeovers. Firms with high information asymmetry are less likely to receive bids (i.e., become targets) than their counterparts with low information asymmetry. In addition, acquirers prefer to use stock over cash when paying for target firms with high information asymmetry because of its contingent-pricing advantage. Furthermore, the target's information asymmetry negatively influences the market reaction of bidding firms upon the announcement of M&A transactions.

Nonetheless, other studies argue that high premiums offered by bidders to target firms with high information asymmetry may point to the discounted values of these targets in the stock market (e.g., Cheng et al., 2016; Li & Tong, 2018; Borochin et al.,

2019). That is, as investors discount the values of equities with high information asymmetry (e.g., Glosten & Milgrom, 1985; Hertzel & Smith, 1993; O'Hara, 2003), acquirers respond to this value-discounting by offering smaller discounts for opaque targets as an opportunity for a bargain. Based on this argument, Cheng et al. (2016) find that a target's information asymmetry is positively associated with acquirer abnormal returns around the announcement of a M&A deal. They argue that the positive reaction on takeovers of target firms with high information asymmetry reveals that the acquirer's shareholders realise and agree with the valuation of the acquirer's managers who would have more information than the market about the target firm. Moreover, they find a positive impact of a target's information asymmetry on combined announcement returns of acquirers and targets as well as the post-takeover operating performance of acquirers.

Using an aggregate factor for information asymmetry and a sample of 543 M&A deals, Borochin et al. (2019) also provide evidence supporting the value-discounting effects of a target's information asymmetry on M&A outcomes. They show that a target's information asymmetry increases the likelihood that a firm receives a bid. They also find that deals involving targets with higher information asymmetry have greater acquisition gains for acquirers, targets, and portfolios of targets and acquirers, as well as greater bid premiums. In addition, they show that the information advantage of the acquirer about a specific target is driven by being the acquirer and the target exist in the same state or belong to the same industry.

Accordingly, the evidence on the effects of a target's information asymmetry on merger outcomes is very mixed. This might be due to several reasons. First, these studies use different proxies for a target's information asymmetry, which is an unobservable construct. Second, they use different sample sizes. Third, they examine different merger dynamics and outcomes. Thus, this study attempts to disentangle the very mixed results of prior studies by (1) using three different proxies for a target's information asymmetry, (2) using a large sample of M&A deals, and (3) investigating the effects of a target's information asymmetry on several M&A dynamics and outcomes. In addition to examining the effects of the target's information asymmetry on the takeover premium as well as the M&A announcement returns for the target, the acquirer and the portfolio of the target and the acquirer, this study examines whether the target's information asymmetry affects the ultimate outcome of the deal (i.e., the likelihood that the deal is completed). Given a deal is completed, this study also investigates whether a target's information asymmetry affects the likelihood of the downward renegotiation of the initial

deal price. Furthermore, this study examines the effect of the target's information asymmetry on the likelihood that the acquirer ex post reports goodwill impairment.

3.3 Hypotheses development

This study builds its predictions on two main theories explaining the potential overpayment in M&A transactions: the winner's curse (Roll, 1986; Thaler, 1988) and the principal-agent conflicts (Jensen & Meckling, 1976; Jensen, 1986). The winner's curse occurs when the payment by the winning bidder for an auctioned asset is too high relative to its intrinsic value. In a competitive bidding situation, the winner's curse takes place because bidders vary in their estimation of the true value of the target, which is uncertain, and the winning bidder is typically the one who most excessively overestimates the target value (Bazerman & Samuelson, 1983). The winner's curse is assumed to apply only within the extent of the "common value" of an asset (i.e., the asset's value is the same for all prospective buyers, but it is unknown or uncertain) and not on the private value that could be unique to each bidder (Black, 1988; Varaiya, 1988). Therefore, although the ex ante estimation of the public value of the target by each bidder is assumed to be unbiased, the bid with the highest estimation will win and would be biased upward (Eckbo, 2009).

The probability that a bidder falls in the winner's curse problem increases when uncertainty about the target's value and competition between bidders increase (e.g., Bazerman & Samuelson, 1983; Varaiya & Ferris, 1987). That is, as uncertainty about the target's prospects increases, variation in the estimation of the target value among bidders and, therefore, the likelihood of valuation error and the winner's curse increase. In addition, as the number of bidders increases (i.e., more competition), the variance of bidders' estimates of the target's true value increases (Varaiya, 1988). Therefore, under the winner's curse explanation, it is concluded that the winning bidder behaves in a suboptimal way when dealing with two factors: the competition between bidders in the takeover market and the level of uncertainty of the target firm (Bazerman & Samuelson, 1983; Varaiya & Ferris, 1987; Eckbo, 2009). If all bidders have ex ante optimal bidding strategies and consider the nature of competition in the market and uncertainty over the target's value, the winner's curse would not occur (Cox & Isaac, 1984). However, rational acting of bidders in auctions is difficult (Thaler, 1988) and if even some bidders rationally

act and discount targets as a result of their high uncertainty, others do not (Black, 1988). Thus, overbidding in the takeover market would typically be the case.[14]

A target's information asymmetry is expected to increase the total uncertainty confronting bidders about the true value of a target firm. That is, consistent with Ferracuti and Stubben (2019), total uncertainty about investment opportunities (which is the target firm in the context of this study) could be classified into fundamental uncertainty and information uncertainty. Then, information uncertainty about the true value of the target firm can arise from information asymmetry and other sources of information uncertainty (McNichols & Stubben, 2015). A target's information asymmetry is likely to have severer adverse effects on merger outcomes than other sources of uncertainty because this source of uncertainty is asymmetric and not easy to observe by bidders. Moreover, it might cause the target's mangers to adversely select information to disclose during the deal negotiation. Therefore, this study predicts that a target's information asymmetry increases the total uncertainty about the true value of a target firm that would, in turn, increase the divergence of opinion amongst bidders. As the winning bidder is typically the one who most excessively overestimates the value of the target, the target's information asymmetry is expected to increase the likelihood that the winning bidder overpays to the target firm.

With respect to the principal-agent conflicts, managers might make investment decisions, including the acquisition of other firms, to achieve their own interests instead of maximising shareholders' wealth (Jensen & Meckling, 1976). Moreover, Jensen (1986) shows that agency conflicts between managers and shareholders increase when managers have excess free cash flows and lower growth opportunities. That is, managers might undertake value-decreasing investments instead of paying out this excess free cash flows to shareholders. Managers might have different motives to grow their firms even this is not in the best interest of shareholders. For instance, empire-building managers might be willing to increase the size of their firms to increase their power, visibility, and prestige (Jensen, 1986; Black, 1988). Also, they might have motives to get higher compensation when they run larger firms (Murphy, 1985). Further, evidence shows that managers might have motives to diversify their employment risk associated with a specific industry by acquiring firms in unrelated businesses (Amihud & Lev, 1981; Morck

[14] Moreover, de Bodt et al. (2018) note that as bidders must bid above the market value of a publicly traded target firm and that the market value would represent a baseline bid, the effect of the winner's curse still exists even when there is only one bidder.

et al., 1990). Managers with such opportunistic motives might not be concerned about overpaying to target shareholders to achieve their personal objectives.

Different corporate governance mechanisms might align managers' interests with those of shareholders and, consequently, affect acquisition decisions. One important mechanism is the board of directors that represents shareholders and monitors managers' decisions, including M&A decisions. Prior evidence shows that the monitoring role of the board of directors can alleviate agency conflicts between managers and shareholders in relation to the acquisition of other firms (e.g., Byrd & Hickman, 1992; Dahya et al., 2019). However, the monitoring role of the board of directors is expected to be affected by the information available to it about the target firm.[15] Therefore, if a target's information asymmetry reduces the quality of information available about the target firm, a target's information asymmetry is likely to weaken the monitoring role of a bidder's board of directors on the managers' acquisition decisions. This might, in turn, increase the risk of the bidder's overpayment to the target firm that is rooted in the principal-agent conflicts.

Accordingly, based on the winner's curse and the principal-agent conflicts, the hypotheses of this study are developed.[16] This study firstly examines the effect of a target's information asymmetry on the takeover premium. The takeover premium represents the increase in the price offered by the bidder to target shareholders relative to the target's pre-merger share price. Dionne et al. (2015) show that less informed bidders about the true values of target firms incur large premiums. Moreover, Chatterjee et al. (2012) find that the takeover premium increases when the divergence of opinions on the target's intrinsic value increases. This study predicts that the target's ex ante information asymmetry increases the overall uncertainty about the true value of the target firm, the divergence between bidders in estimating the true value of the target firm, and the likelihood that bidders overbid in the takeover market. Therefore, this study hypothesises that target firms with high degrees of ex ante information asymmetry are likely to receive higher premiums. Formally stated,

> **Hypothesis 1:** The target's information asymmetry is positively associated with the takeover premium

[15] Instead of focusing on the role of the ex post information of the company on the monitoring role of its board of directors (e.g., Bushman & Smith, 2001), this study addresses the role of ex ante information available about the target firm in helping the bidder's board of directors to effectively monitor the decisions of bidder's managers.

[16] This study does not attempt to empirically distinguish between these two theories. However, this study anticipates that the predictions with regard to a target's information asymmetry will be the same.

This study also examines the effects of a target's information asymmetry on the market reaction to the announcement of M&A deals. Shareholders of target firms prefer to receive larger premiums in M&A deals. Large payments by bidders translate to higher returns for shareholders of target firms. Therefore, if a target's information asymmetry benefits target shareholders by receiving larger premiums, it is predicted that target announcement returns around M&A deals are higher when a target's information asymmetry is higher. Thus, the second hypothesis is formally stated as follows:

> **Hypothesis 2:** The target's information asymmetry is positively associated with target announcement returns

Prior evidence on the effect of a target's information asymmetry on acquirer announcement returns and combined announcement returns is mixed. McNichols and Stubben (2015) find that uncertainty about the target firm leads to decreasing acquirer returns around the acquisition announcement date. In addition, after controlling for uncertainty, they find that acquirers gain higher returns around acquisition announcements when targets have a higher quality of accounting, suggesting that the target's high accounting quality increases the accuracy of the acquirer's valuation of the target firm and, therefore, making better acquisition decisions. In contrast, Cheng et al. (2016) find that information asymmetry of target firms is positively associated with acquirer announcement returns as well as combined announcement returns. They argue that the positive acquirers' market reactions upon the announcement of M&A deals involving target firms with high information asymmetry reveal that the market realizes and agrees with the valuation of the acquirer that would have more information than the market about the target firm.

Based on the predictions of the winner's curse and the principal-agent conflicts, if the target's information asymmetry makes bidders less effective to bid and decreases their ability to accurately estimate the true value of the target, large premiums might indicate the bidder's overpayment that would be negatively perceived by shareholders of the bidding firm. Moreover, combined announcement returns of portfolios of target and acquiring firms are also expected to be lower. Therefore, this study conjectures that both bidder announcement returns and combined announcement returns decrease when a target's information asymmetry increases. The following two hypotheses are formulated:

Hypothesis 3: The target's information asymmetry is negatively associated with acquirer announcement returns

Hypothesis 4: The target's information asymmetry is negatively associated with combined announcement returns

Although the acquisition agreement is a binding contract between merger participants, it does not mean that the deal must be completed. Bates and Lemmon (2003) report that the percentage of terminated deals is 21% of the announced deals. Most of the announced deals do not become effective on the same day of the announcement (Marquardt & Zur, 2015). Therefore, the withdrawal from the deal can happen at any time between the announcement date and the completion date. After signing the acquisition agreement between the target and the bidder, the transactional due diligence stage starts, in which the bidder gains more access to the target's private information such as accounting estimates, different contracts, etc. (Skaife & Wangerin, 2013). During this stage, if the bidder figures out material adverse risks, the bidder's decision could be entirely withdrawing the deal. Consistent with this, Denis and Macias (2013) show that acquisition participants incorporate in their acquisition agreements material adverse change clauses that provide acquirers the right to costlessly quit and do not complete the deal in the event of occurring or discovering material adverse risks during the transactional due diligence stage. This study argues that the likelihood that the bidder discovers material adverse risks during the transactional due diligence increases when the target's information asymmetry increases. This might induce bidders that have initially overestimated the target's value to make rational decisions of terminating their deals. Thus, this study predicts that a target's information asymmetry increases the likelihood of a deal termination. The following hypothesis is formally stated as follows:

Hypothesis 5: The target's information asymmetry is positively associated with the likelihood of the deal termination

As the target's information asymmetry is argued to increase the likelihood that the bidder discovers material adverse risks during the transactional due diligence, this might induce the bidder to renegotiate the initial deal price with the target. In other words, although some bidders might decide to terminate the deal when they figure out material adverse risks, arguably due to the target's ex ante information asymmetry, other bidders

might decide to complete the deal, but after downward renegotiating their initial bids. Denis and Macias (2013) find that post-announcement material adverse risks affect the likelihood of the M&A deal completion and renegotiation. They find 69% of terminated deals and 80% of renegotiated deals take place due to targets' material adverse risks occurred or discovered after signing acquisition agreements. Thus, this study predicts that a target's information asymmetry increases the likelihood that a bidder downward renegotiates the initial deal price. The following hypothesis is formulated:

> **Hypothesis 6:** The target's information asymmetry is positively associated with the likelihood of downward renegotiating the initial deal price

To determine the long-term effect of the target's information asymmetry on the bidder's performance, this study examines whether bidders, who consummate deals involving target firms with high ex ante information asymmetry, are more likely to subsequently report goodwill impairment losses. Prior studies show that goodwill impairments are an ex post indication for poor M&A decisions previously undertaken by firms (e.g., Hayn & Hughes, 2006; Gu & Lev, 2011; Olante, 2013). That is, acquiring firms recognise goodwill impairments when the fair values of the previously acquired firms reduce. Although some bidders might terminate the deal or at least downward renegotiate the initial deal price when discovering material adverse risks, which might be due to the target's high information asymmetry, others might not. As noted by Black (1988), if some bidders rationally behave in valuing target firms, others do not. Moreover, even if the bidder has renegotiated the initial deal price downward, this does not guarantee that the price is sufficiently discounted to consider the information risk of the target firm. Due to the hubris and/or the principal-agent conflicts, bidder managers might decide to continue in deals that are not value-maximising for shareholders. Therefore, this study predicts that if the target's information asymmetry increases the difficulty of accurately estimating the true value of the target firm, which might lead to the bidder's overpayment, the likelihood that the bidder subsequently reports goodwill impairment losses will be higher. The following hypothesis is formulated:

> **Hypothesis 7:** The target's information asymmetry is positively associated with the acquirer's ex post reporting of goodwill impairment losses

3.4 Research design

This study uses the event study methodology to examine the effects of a target's information asymmetry on M&A outcomes. This methodology has become the standard method in the literature for measuring the market reaction to different corporate events such as M&A transactions, initial public offerings, and seasoned equity offerings.[17] Measures of variables and the empirical model are discussed below in detail.

3.4.1 Measures of target's information asymmetry

This study uses three different measures to proxy for the target's information asymmetry as follows:

3.4.1.1 Idiosyncratic stock return volatility

The first proxy used by this study for the target's information asymmetry is the idiosyncratic stock return volatility of the target firm. In a context where the total uncertainty about the firm is divided into market-wide and firm-specific parts, Dierkens (1991) shows that stock return volatility captures the firm's uncertainty arising from the managers' informational advantage over the market (i.e., uncertainty arising from firm-specific information that insiders know but the market does not). Prior studies have extensively used idiosyncratic stock return volatility to proxy for information asymmetry in different settings such as equity issues (e.g., Kim et al., 2013) and mergers and acquisitions (e.g., Moeller et al., 2007; Officer et al., 2009; Cai et al., 2016). Moreover, some studies use stock return volatility to proxy for the divergence of opinion among investors (e.g., Boehme et al., 2006; Chatterjee et al., 2012).

This study estimates the target's idiosyncratic stock return volatility, *Tar_Vol*, as the standard deviation of the target's daily abnormal stock returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., a trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. A minimum of 100 available

[17] According to the event study methodology, it is assumed that the market is efficient (i.e., security prices accurately reflect all publicly available information). Chapter 2, section 2.6, provides a brief discussion on the event study methodology and its relationship with tests of the efficient market hypothesis. For more details about the efficient market hypothesis see, for example, Fama et al. (1969), Fama (1991), Malkiel (2003) and Malkiel (2005), and for more details about the event study methodology see, for example, Brown and Warner (1985), Peterson (1989), Binder (1998) and Kothari and Warner (2007).

daily stock returns data is required for estimating the market model. Specifically, the stock return volatility for each target firm using the market model is estimated as follows:

a) Estimating the predicted/normal stock returns using the market model over the estimation period (i.e., the trading-day window: -263, -64) by running the following time-series regression model for each target firm:

$$ret_{it} = \alpha_i + \beta_i \ vwretd_{mt} + \varepsilon_{it}, \quad t = -263, -64$$

where ret_{it} is the CRSP daily stock return, adjusted for dividends, for the target firm *i* in the day *t*, and $vwretd_{mt}$ is the CRSP value-weighted market returns, including dividends.

b) By using the estimated parameters (α_i and β_i) of the market model above, daily predicted/normal stock returns for each target firm, $Normal\_ret_{it}$, are calculated as follows:

$$Normal\_ret_{it} = b_0 + b_1 \ vwretd_{mt}, \quad t = -263, -64$$

c) Calculating the daily abnormal stock returns (*Ab_ret*) over the trading-day window from -263 to -64 by the difference between the daily *actual* returns and the daily *predicted/normal* returns:

$$Ab\_ret_{it} = ret_{it} - Normal\_ret_{it}, \quad t = -263, -64$$

d) Calculating the standard deviation of the daily abnormal stock returns over the estimation period (i.e., the trading-day window: -263, -64) for each target firm:

$$Tar\_Vol_i = \text{sd}\ [\ Ab\_ret_{it}, \quad t = -263, -64]$$

3.4.1.2 Bid-ask spread

The second proxy used by this study for the target's information asymmetry is the target's bid-ask spread (e.g., Glosten & Milgrom, 1985; Welker, 1995; Corwin & Schultz, 2012; Lee & Chung, 2013). Several studies have used bid-ask spread to proxy for information asymmetry (e.g., LaFond & Watts, 2008; Khan & Watts, 2009; Cai et al., 2016; Cheng et al., 2016; García Lara et al., 2016). This study focuses on information asymmetry between the target's managers and the market or, more specifically, information asymmetry between two agents: the target's managers and the bidder's managers. Bid-ask spread is likely to capture information asymmetry between informed and uninformed investors.

However, as argued by Khan and Watts (2009), information asymmetry between managers and the market would induce investors to search for private information. This search for private information would divide investors to those who have private information and those who do not and, hence, generate information asymmetry between groups of investors, which is captured by the bid-ask spread.[18]

This study estimates the target's bid-ask spread, *Tar_BidAsk*, as the daily spread between the CRSP bid (low) and ask (high) scaled by the spread midpoint [(CRSP items: askhi + bidlo)/2], averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64).

When estimating the target's stock return volatility as well as bid-ask spread, this study uses windows that end at three calendar months prior to the deal announcement date (i.e., around the trading day -64) to avoid the effect of any potential changes in the target's share price resulting from any rumours about the acquisition. This is consistent with Schwert (1996) who shows that the rise in the target's stock price manifests mainly around the trading day -42 (i.e., about two months) prior to the deal announcement date (i.e., day 0) and that the leakage of information about the deal is not probable before the trading day -64 (i.e., about three months) prior to the deal announcement date.

In empirical analyses, consistent with Kravet (2014) and Chen et al. (2018a), this study uses the scaled decile rank of both the target's stock return volatility and bid-ask spread. This would mitigate concerns about nonlinearities and measurement errors and, consequently, avoid getting spurious results. The scaled decile rank is calculated by firstly ranking the raw values of stock return volatility or bid-ask spread for all target firms into deciles. Then, by subtracting one from the decile rank of each target and dividing it by nine, the scaled decile rank will range from 0 to 1.

3.4.1.3 R&D intensity

The third proxy for the target's information asymmetry used by this study is whether the target firm has a high level of R&D expenditures. Aboody and Lev (2000) examine the effect of information asymmetry on insider gains by focusing on R&D as a main source

[18] Despite prior studies have extensively used bid-ask spread as a proxy for information asymmetry, there is a large literature showing that information asymmetry represents only one component of bid-ask spread. That is, bid-ask spread also reflects elements like the cost of providing liquidity and the need to cover market-maker costs. For more discussion and evidence on components of bid-ask spread see, for example, Glosten (1987); Glosten and Harris (1988); George et al. (1991); and Huang and Stoll (1997).

for the insiders' informational advantage over outsiders. They show that insider gains are significantly higher in firms with intensive R&D activities than in firms without R&D. As R&D projects are unique and do not have organised markets from which information can be derived about their values or productivity, Aboody and Lev (2000) contend that investment in R&D projects is a main contributor for information asymmetry between managers and outside investors.

Moreover, as noted by Francis et al. (2004), R&D intensity represents an innate (intrinsic) determinate that affects the quality of earnings. R&D intensity is considered to be a less noisy proxy for information asymmetry relative to other proxies such stock return volatility and bid-ask spread that might reflect, in addition to information asymmetry, other firm-specific and market-wide factors. Furthermore, R&D intensity provides an indication for the level of intangible assets that are shown by prior studies to affect information asymmetry (e.g., Barth & Kasznik, 1999; Barth et al., 2001). Several studies have used R&D intensity to proxy for uncertainty and information asymmetry (e.g., Officer et al., 2009; Cai et al., 2016; Cheng et al., 2016).

This study calculates R&D intensity as the percentage of the target's R&D expenditures (Compustat item: xrd) to total assets (Compustat item: at). To proxy for target firms with high information asymmetry, this study uses an indicator variable, *Tar_R&D*, that equals one if the target firm has a percentage of R&D to total assets that is higher than 5%, and zero otherwise.[19]

3.4.2 Dependent variables

The dependent variables are the merger outcomes examined in this study as follows:

3.4.2.1 Takeover premium

This study uses two different methods to estimate the takeover premium: the value-based method and the market-based method. First, the value-based method depends on the value of the bidder's offer to the target firm. Specifically, similar to Boone and Mulherin (2007) and Skaife and Wangerin (2013), the takeover premium is defined as the ratio of the price offered by the acquirer to the target firm relative to the target's share price four calendar

[19] When defining *Tar_R&D*, target firms with missing data about R&D expenditures on Compustat are considered to have zero R&D. In the robustness tests, this study uses seven alternative specifications for defining the target's R&D intensity including the exclusion of target firms with missing data about R&D expenditures, the use of the ratio of R&D to total assets as a continuous variable, and the use of different cut-offs of the percentage of R&D expenditures to total assets. See section 3.6.3.

weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. The label *Prem_4w* is given to this measure.

Second, this study follows Schwert (1996; 2000) and uses the market-based method to estimate the takeover premium, *Prem_Schwert*, which is derived from the stock returns of each target firm. Specifically, the takeover premium is estimated as cumulative daily abnormal returns of each target firm over a window of trading days starting from -63 to +126 relative to the deal announcement day (0), i.e., about three months prior to six months after the deal announcement date. Normal returns for each target firm are firstly estimated using the market model over a window of trading days ranges from -316 to -64 relative to the announcement day (0), and using each target daily actual returns, adjusted by dividends, and the CRSP value-weighted returns, including dividends, as the market index. Data for at least 100 trading days during the estimation window is required to estimate *Prem_Schwert* for each target firm. One advantage of this measure is that it considers the post-announcement abnormal returns of target firms when estimating the takeover premium. In addition, as this measure depends on the target's stock returns, it avoids the susceptibility to the estimation methods and assumptions used by Thomson Reuters Eikon database in determining non-cash offer prices (Officer, 2003). However, it might be susceptible to the confounding effect of other factors other than the offer price, such as the likelihood that an initial offer succeeds or fails as well as the likelihood of competition (Officer, 2003; Eckbo, 2009).

3.4.2.2 Target or acquirer announcement returns

Following a large body of research (e.g., Bradley et al., 1988; Cai et al., 2016; Martin & Shalev, 2017; Chen et al., 2018a), this study estimates the takeover gains for shareholders of the target or the acquirer as cumulative abnormal returns (CAR) for the target or the acquirer around the deal announcement date. As stock prices quickly reflect new information, including information about the expected values of corporate events such as mergers and acquisitions, in the efficient capital market, the use of the stock price abnormal reaction within a short-term event window around the deal announcement date would provide statistically reliable evidence of the value creation or destruction of M&A transactions (Andrade et al., 2001).

Therefore, this study estimates target (acquirer) announcement returns as cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1),

centred on the day of the deal announcement (day 0). Abnormal returns for the target or the acquirer are estimated using the market model and the CRSP value-weighted returns as the market index.[20] In particular, parameters/coefficients of the relation between firm returns and market returns are firstly estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. Specifically, the following OLS regression is estimated for each target or acquirer:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}, \text{ over the estimation window (t = -263, -64).}$$

Then, with the assumption that coefficients of the relation between firm returns and market returns are constant during both the estimation and the event windows, normal returns during the event window (-1, +1) are estimated using the estimated coefficients and market returns during the event window as follows:

$$Normal\_R_{i,t} = \alpha_i + \beta_i R_{m,t}, \text{ over the event window (t = -1, +1).}$$

Next, deviations of actual returns from estimated normal returns during the event window are used as an estimation of abnormal returns as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - Normal\_R_{i,t}, \text{ over the event window (t = -1, +1).}$$

Last, for each target or acquirer, abnormal returns around the deal announcement date are cumulated over the event window (-1, +1) as follows:

$$TarRet_i \text{ or } AcqRet_i = \sum_{t=-1}^{1} Abnormal\_R_{i,t}$$

3.4.2.3 Combined announcement returns

Following prior studies (e.g., Harford et al., 2012; Chen et al., 2018a), combined announcement returns are estimated using cumulative abnormal returns of the value-weighted portfolio of both the target and the acquirer that are previously estimated using the market model over the 3-day event window (-1, +1) where day 0 is the day of the deal announcement. The weights for both the target and the acquirer are based on their relative

[20] In the robustness check, this study uses the market-adjusted model as an alternative method to estimate target and acquirer announcement returns.

market values three months prior to the deal announcement date (specifically, on the trading day -64). Accordingly, combined announcement returns of the value-weighted portfolio of both the target and the acquirer are calculated as follows:

$$CombinedRet_i = \frac{[(Tar\_Ret_i * Tar\_MarkCap_i) + (Acq\_Ret_i * Acq\_MarkCap_i)]}{(Tar\_MarkCap_i + Acq\_MarkCap_i)},$$

where $CombinedRet_i$ is combined announcement returns of the value-weighted portfolio of both the target and the acquirer involving in each deal over the 3-day event window. $Tar\_MarkCap_i$ and $Acq\_MarkCap_i$ are the market values of equity for the target and the acquirer, respectively, three months prior to the deal announcement date (on the trading day -64).

3.4.2.4 Deal termination

It is defined as an indicator variable that equals one if the announced deal is terminated, and zero otherwise.

3.4.2.5 Downward renegotiation of the initial deal price

During the period between the deal announcement and the deal completion dates, the target and the acquirer might renegotiate the initial deal price upward or downward. Thomson Reuters Eikon discloses the two values of the deal offer price: the initial and the final prices. The initial offer price is the price that the acquirer agrees to pay per share for the target firm on the acquisition agreement date. The final price is the price that is actually paid by the acquirer per share for the target firm upon the deal completion date. By comparing these prices, this study indicates whether the initial deal price is downward renegotiated during the transactional due diligence or not. Therefore, this study defines *Renegotiated* as an indicator variable that equals one if the deal price that is initially offered by the bidder is downward renegotiated (i.e., the final offer price is lower than the initial offer price), as reported by Thomson Reuter Eikon, and zero otherwise.

3.4.2.6 Goodwill impairment

This study follows Chen et al. (2018a) and defines goodwill impairment as an indicator variable that equals one if the bidder reports goodwill impairment (Compustat item:

gdwlip) in the fiscal year of the deal completion or any of the subsequent three years of the deal completion year, and zero otherwise.

3.4.3 Empirical model

The following baseline cross-sectional regression model is used to test the hypotheses:

$$\begin{aligned} Dep\_Var_i = {} & \alpha_0 + \alpha_1 Tar\_InfAsym_i + \alpha_2 Tar\_Size_i + \alpha_3 Tar\_MTB_i \\ & + \alpha_4 Tar\_Lev_i + \alpha_5 Tar\_ROE_i + \alpha_6 Tender_i + \alpha_7 Competition_i \\ & + \alpha_8 Toehold_i + \alpha_9 Hostile_i + \alpha_{10} Cash_i + \alpha_{11} Stock_i \\ & + \alpha_{12} SameInd_i + \mu_n \, Year\ dummies + \varepsilon_i \end{aligned} \quad (1)$$

where Dep_Var_i is one of the merger outcomes and $Tar\_InfAsym_i$ is one of the proxies for information asymmetry illustrated above. The Ordinary Least Square (OLS) and logistic regressions are used when the dependent variable is continuous and categorical, respectively. Robust standard errors clustered by year and firm are used to correct for time-series and cross-section correlations (Petersen, 2009).

This study follows prior studies (e.g., Alexandridis et al., 2013; Raman et al., 2013; Skaife & Wangerin, 2013) and controls for several target firm-specific operating and financial risks that might be correlated with proxies of information asymmetry as well as merger outcomes. These variables include the target's size, market to book ratio, leverage, and return on equity. The target's size, *Tar_Size*, is defined as the natural logarithm of the target's market capitalisation. Market to book, *Tar_MTB*, is the ratio of the target's market value of equity to its book value of equity. Leverage, *Tar_Lev*, is the ratio of the target's long-term debt and short-term debt to its total assets. Return on equity, *Tar_ROE*, is the ratio of the target's income before extraordinary items to its book value of equity. *Tar_Size*, *Tar_MTB*, *Tar_Lev*, and *Tar_ROE* are all measured at the end of the target's fiscal year preceding the deal announcement date.

This study also controls for several deal-specific characteristics found in the literature to affect merger outcomes. Deal characteristics include the following: whether the deal is a tender offer (Offenberg & Pirinsky, 2015); competition between bidders over the target (e.g., Walkling & Edmister, 1985; Bradley et al., 1988); whether the bidder owns shares in the target firm prior to the deal announcement date, i.e., the toehold (Betton & Eckbo, 2000); whether the deal is a hostile (Schwert, 2000); the method of

payment (e.g., Fuller et al., 2002; Moeller et al., 2007; Savor & Lu, 2009); whether both the target and the acquirer belong to the same industry (Walkling & Edmister, 1985). *Hostile* is a dummy variable that equals one if the deal is classified, by Thomson Reuters Eikon, as a hostile or unsolicited, and zero otherwise. *Competition* is a dummy variable that equals one if two or more bidders are involved in the deal, and zero otherwise. *Toehold* is a dummy variable that equals one if the bidder owns at least 5% of the target's shares prior to the deal announcement date, and zero otherwise. *Tender* is a dummy variable that equals one when the deal form is classified, by Thomson Reuters Eikon, as a tender, and zero otherwise. *Cash* (*Stock*) is a dummy variable that equals one if 90% or more of the deal price is paid using cash (stock), and zero otherwise. *SameInd* is a dummy variable that equals one if both the target and the acquirer belong to the same industry (based on the two-digit Standard Industrial Classification (SIC) code), and zero otherwise. Year dummies are also included to control for year fixed effects. Definitions of all variables are provided in Table 3.1.

3.5 Sample and descriptive statistics

3.5.1 Sample selection

This study uses a large sample of merger and acquisition deals between U.S. publicly traded firms announced during the period from 1/1/1986 to 31/12/2017.[21] Data about M&A deals are collected from Thomson Reuters Eikon (Deal Screener) database. Data about M&A deals is augmented by additional data collected from Thomson Reuters One database.[22] Then, M&A data is merged with accounting data collected from Compustat and market data collected from the Centre for Research in Security Prices (CRSP) for

[21] This study uses a sample of U.S. firms for at least two main reasons. First, the U.S. mergers and acquisitions market represents the largest in the world in terms of the number as well as value of transactions. For instance, based on the statistics by the Institute for Mergers, Acquisitions and Alliances, there were 15,776 M&A transactions in the North America with a value of about $2 trillion in 2019, out of 49,849 transactions announced worldwide that were valued about $3.7 trillion. Therefore, the U.S. M&A market would be of more interest for a larger number of users including investors, managers, and policymakers. Second, it is expected that data required for this study will be available for U.S. firms more than firms in other countries. Thus, data access and availability would be of less concern when using a sample of U.S. firms.

[22] I am grateful to Thomson Reuters Corporation for providing me a temporary access to Thomson One database.

both the target and bidding firms. This study starts the sample in 1986 because data required to measure the main variables is very limited before this year.

Following prior studies (e.g., Moeller et al., 2003; McNichols & Stubben, 2015; Cai et al., 2016; Brooks et al., 2018), this study selects the sample using the following criteria:

1) Both the bidder and the target must be U.S. publicly traded firms so that they have available accounting and market data,
2) Deals could be either completed or terminated,
3) Deals that are labelled by Thomson Reuters Eikon as privatisations, going privates, repurchases, self-tenders, recapitalisations, spin-offs, or exchange offers are excluded,
4) The bidder must begin the deal with less than 50% of ownership in the target firm and, in the case of the deal completion, end up with at least 90% of ownership.
5) The deal value must equal to $1 million at least to ensure the economic materiality of the deal,
6) Data about the takeover premium must be available on Thomson Reuters Eikon,
7) In the case of the deal completion, the number of days between the announcement date and the completion date must not exceed 1000 days, and
8) Accounting and market data on Compustat and CRSP, respectively, required to measure the main variables must be available.

Imposing the above criteria leads to a final sample of 3,789 M&A deals with all necessary data, of which 3,254 are completed and 535 are terminated. This sample, however, varies when examining different merger outcomes. Table 3.2, Panel A, summarises the process of the sample selection.

Table 3.1
Variable definitions

Variable	Definition	Data source
a) Merger outcomes		
Prem_4w	The ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one.	Thomson Reuters (TR) Eikon
Prem_Schwert	Cumulative daily abnormal returns of each target firm over a window of trading days starting from -63 to +126 relative to the deal announcement day (0) (i.e., about three months prior to six months after the deal announcement date). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each target are estimated over a window of trading days ranges from -316 to -64 relative to the deal announcement day (0). Firms are required to have available daily stock returns for at least 100 trading days to estimate the market model.	CRSP (Daily Stock File)
Tar_Ret	Cumulative abnormal returns of the target firm over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each target firm are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms are required to have available stock returns data for at least 100 trading days to estimate the market model.	CRSP (Daily Stock File)
Acq_Ret	Cumulative abnormal returns of the acquirer over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each acquirer are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms are required to have available stock returns data for at least 100 trading days to estimate the market model.	CRSP (Daily Stock File)
Combined_Ret	Cumulative abnormal returns of the value-weighted portfolio of both the target and the acquirer that are previously estimated using the market model over the 3-day event window (-1, +1) where day 0 is the day of the deal announcement. The weights for both the target and the acquirer are based on their relative market values three months prior to the deal announcement date (specifically, on the trading day -64).	CRSP (Daily Stock File)
Terminated	An indicator variable that equals one if the announced deal is terminated, and zero otherwise.	TR Eikon
Renegotiated	An indicator variable that equals one if the initial deal price is downward renegotiated (i.e., the final offer price paid by the bidder is lower than the initial offer price), and zero otherwise.	TR Eikon
GW_Impairment	An indicator variable that equals one if the bidder reports goodwill impairment (Compustat item: gdwlip) in the fiscal year of the deal completion or in any of the subsequent three fiscal years of the deal completion year, and zero otherwise.	Compustat

b) Proxies for the target's information asymmetry

Tar_Vol	The scaled decile rank of the target's idiosyncratic stock return volatility that is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Daily stock returns for a minimum of 100 trading days over the estimation window is required to estimate the market model for each target firm.	CRSP (Daily Stock File)
Tar_BidAsk	The scaled decile rank of the target's bid-ask spread that is estimated as the daily spread between the CRSP bid (low) and ask (high) scaled by the spread midpoint [(askhi + bidlo)/2], averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64).	CRSP (Daily Stock File)
Tar_R&D	An indicator variable that equals one if the target firm has a percentage of R&D (Compustat item: xrd) to total assets (Compustat item: at) that is higher than 5%, and zero otherwise.	Compustat

c) Target firm-specific characteristics

Tar_Size	The natural logarithm of the target's market capitalisation at the end of the fiscal year prior to the deal announcement date [prcc_f*csho].	Compustat
Tar_MTB	The ratio of the target's market value of equity to its book value of equity at the end of the fiscal year prior to the deal announcement date [(prcc_f*csho)/ceq].	Compustat
Tar_Lev	The ratio of the target's long-term debt and short-term debt to total assets at the end of the fiscal year prior to the deal announcement date [(dltt+dlc)/at].	Compustat
Tar_ROE	The ratio of the target's income before extraordinary items to its book value of equity at the end of the fiscal year prior to the deal announcement date [ib/ceq].	Compustat

d) Deal-specific Characteristics

Hostile	An indicator variable that equals one if the deal is classified by Thomson Reuters Eikon as a hostile or unsolicited, and zero otherwise.	TR Eikon
Competition	An indicator variable that equals one if two or more bidders are involved in the deal, and zero otherwise.	TR Eikon
Toehold	An indicator variable that equals one if the bidder owns at least 5% of the target's shares prior to the deal announcement date, and zero otherwise.	TR Eikon
Tender	An indicator variable that equals one if the deal is classified by Thomson Reuters Eikon as a tender, and zero otherwise.	TR Eikon
Cash	An indicator variable that equals one if 90% or more of the deal consideration is paid using cash, and zero otherwise.	TR Eikon
Stock	An indicator variable that equals one if 90% or more of the deal consideration is paid using the acquirer's shares, and zero otherwise.	TR Eikon
SameInd	An indicator variable that equals one if both the target and the acquirer belong to the same two-digit SIC industry classification, and zero otherwise.	TR Eikon

Table 3.2
Sample selection and distribution

Panel A: Sample selection process

	# deals
Announced M&A deals between the U.S. publicly listed companies between 1/1/1986 and 31/12/2017	38,605
Less:	
Deals with acquirers owning 50% or more of targets' shares at the deal announcement date	(371)
Deals with acquirers ending up with less than 90% of targets' shares at the deal completion date	(31,238)
Deals with a value of less than $1 million	(549)
Deals with missing data for the SDC premium four weeks prior to the deal announcement	(1,226)
Deals with missing data from Compustat or CRSP to measure the target's information asymmetry or the control variables	(1,432)
Final sample	3,789

Panel B: Deals and deal outcomes by announcement year

Year	Freq.	%	Premium	Target Return	Acquirer Return	Synergy	Completed deals	Terminated deals
1986	80	2.11	0.382	0.206	0.001	0.033	62	18
1987	88	2.32	0.414	0.220	-0.017	0.016	63	25
1988	99	2.61	0.618	0.209	-0.002	0.030	67	32
1989	75	1.98	0.512	0.145	-0.013	0.012	48	27
1990	51	1.35	0.515	0.227	-0.013	0.015	41	10
1991	54	1.43	0.612	0.245	-0.013	0.009	44	10
1992	53	1.40	0.466	0.183	-0.005	0.023	43	10
1993	66	1.74	0.510	0.224	-0.002	0.026	51	15
1994	106	2.80	0.388	0.177	-0.009	0.022	84	22
1995	178	4.70	0.403	0.183	-0.016	0.013	154	24
1996	211	5.57	0.369	0.164	-0.004	0.026	184	27
1997	276	7.28	0.381	0.152	-0.009	0.016	244	32
1998	281	7.42	0.466	0.184	-0.028	0.005	254	27
1999	295	7.79	0.504	0.215	-0.012	0.016	255	40
2000	224	5.91	0.492	0.223	-0.032	0.005	193	31
2001	184	4.86	0.444	0.268	-0.023	0.009	163	21
2002	97	2.56	0.451	0.294	-0.018	0.005	87	10
2003	127	3.35	0.363	0.214	-0.025	-0.003	120	7
2004	130	3.43	0.320	0.185	-0.018	0.015	120	10
2005	104	2.74	0.285	0.191	-0.019	0.008	94	10
2006	106	2.80	0.317	0.198	-0.015	0.011	96	10
2007	120	3.17	0.344	0.252	-0.012	0.016	107	13
2008	92	2.43	0.417	0.316	-0.016	0.016	69	23
2009	73	1.93	0.586	0.336	-0.007	0.020	62	11
2010	81	2.14	0.522	0.336	0.001	0.031	70	11
2011	57	1.50	0.423	0.240	-0.017	0.029	45	12
2012	69	1.82	0.499	0.342	0.006	0.045	66	3
2013	71	1.87	0.377	0.285	0.019	0.052	66	5
2014	83	2.19	0.403	0.280	0.002	0.043	72	11
2015	105	2.77	0.324	0.183	-0.007	0.027	90	15
2016	92	2.43	0.406	0.268	-0.015	0.023	88	4
2017	61	1.61	0.357	0.205	-0.019	0.014	52	9
Total	3,789	100.00					3,254	535

This table reports the sample selection and distribution. Panel A summarises the procedures for selecting the final M&A sample. Data about M&A deals is primarily collected from Thomson Reuters Eikon and then merged with financial and stock market data extracted from Compustat and CRSP databases, respectively. The final sample consists of 3,789 announced M&A deals between the U.S. publicly listed companies between 1986 and 2017. Panel B presents the number and percentage of announced deals, means of some merger outcomes, and the number of completed and terminated deals each year.

Panel B of Table 3.2 presents the sample distribution by the deal announcement year. The number of deals is distributed over all years, with no year exceeds 8% of the total sample. The year with the lowest (highest) number of deals is 1990 (1999). The number of deals increases over the 1990s and up to 1999 and then starts to drop concurrently with the dot-com crash in 2000. The average takeover premium that is estimated using the value-based method, *Prem_4w*, is positive each year and ranges from 28% to 62%. Corresponding with the positive premium, the mean target announcement returns is positive each year and ranges from 14% to 34%. Consistent with the wide evidence that takeover transactions are value-reducing or value-neutral to bidder shareholders (see, e.g., Andrade et al., 2001; Eckbo, 2009), the mean bidder announcement returns is negative or almost zero in all years except 2012 and 2013. The average combined announcement returns is positive almost in all years. The highest average of combined announcement returns of about 4.5% is in 2012. All years include both completed as well as terminated deals over the whole sample period.

3.5.2 Descriptive statistics

Table 3.3 presents the descriptive statistics for and the correlation coefficients among the main variables in this study. The descriptive statistics in Panel A of Table 3.3 shows that the average takeover premium equals 42.8% when it is defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date. When the premium is estimated using the market-based method, the average premium equals 30.8%. This suggests that bidders typically offer large positive premiums to target firms in M&A transactions. Consistent with these large premiums, the mean target announcement returns is equal to 21.8%. On the other hand, bidders experience negative announcement returns of 1.3%, on average. The statistics also show that the mean combined announcement returns for portfolios of both target and bidder firms is positive (1.7%). These results are, in general, consistent with prior studies (e.g., Betton et al., 2008; Eckbo, 2009; McNichols & Stubben, 2015; Cai et al., 2016). About 14% of all deals in the sample are unsuccessful or terminated deals, which is consistent with the percentage reported in Skaife and Wangerin (2013). The initial deal price in 3.7% of all completed deals is downward renegotiated during the period between the deal announcement date and the completion date. Furthermore, the statistics show that bidders in about 15% of completed deals report

goodwill impairment losses in the fiscal year of the deal completion or in any of the subsequent three fiscal years of the deal completion.

With respect to proxies for the target's information asymmetry, the statistics show that the mean and median values for the target's idiosyncratic stock return volatility equal 0.033 and 0.028, respectively, and for the target's bid-ask spread are 0.043 and 0.036, respectively. These figures are comparable to those reported in Cheng et al. (2016). About 25% of all deals involve target firms that have R&D expenditures that represent at least 5% of their respective total assets.

The statistics for other target firm-specific characteristics show that the median target size equals $162 million, which reflects that target firms are substantially small compared to bidding firms (the median bidder size is $1,699 million). The statistics also show that the average ratios of MTB and ROE for target firms equal 2.460 and -2.1%, respectively, which are lower than those for bidder firms (3.250 and 11.1%, respectively). This might lend support for the predictions of the Roll's (1986) hubris hypothesis that bidders perform better prior to M&A transactions.

The deal characteristics statistics are generally comparable to those reported in prior studies (e.g., McNichols & Stubben, 2015; Brooks et al., 2018). About 17% of all deals are tender offers, and 9% of all deals include more than one bidder contesting to control the target. Only about 4% of all deals involve bidders with toehold (i.e., hold at least 5% of the shares of target firms prior to the announcement of deals). Most deals in the sample are negotiated because hostile or unsolicited deals represent only about 7% of all deals. Cash- and stock-financed deals represent about 30% and 40% of all deals, respectively. Last, about two-thirds of the whole sample are deals between companies that belong to the same industry.

Panel B of Table 3.3 presents the pairwise correlation coefficients for Spearman's (above diagonal) and Pearson's (below diagonal) among the main variables of this study. It shows that all three proxies of the target's information asymmetry are positively and significantly correlated with the two measures of the takeover premium. This is consistent with this study's prediction of the positive relation between information asymmetry of target firms and the takeover premium. With regard to the market reaction to the announcement of M&A deals, and consistent with the predictions, the results demonstrate that target announcement returns (combined announcement returns) are positively (negatively) correlated with all proxies of the target's information asymmetry. The Coefficients of the Pearson correlations between acquirer announcement returns and

proxies of the target's information asymmetry are negative, consistent with the prediction, but only significant with the target's R&D intensity. The results also show that both the target's bid-ask spread and R&D intensity are negatively (but only significant with R&D intensity) correlated with the dummy variable of the deal termination, which seems to be inconsistent with the prediction of this study. This might be because of the effect of other variables on the likelihood of the deal termination and the target's information asymmetry, which will be controlled for in the multivariate analyses. Consistent with the prediction of H6, the results reveal a positive and statistically significant correlation between the likelihood of downward renegotiating the initial deal price and both the target's stock return volatility and bid-ask spread. In addition, the likelihood of the goodwill impairment is positively correlated with both the target's bid-ask spread and R&D intensity, consistent with the prediction of H7.

With respect to other target- and deal-specific characteristics, the results show a negative and significant correlation between target size and the two measures of the takeover premium, suggesting that smaller targets receive larger premiums. Consistent with the literature (e.g., Eckbo, 2009), there is a significant and positive correlation between *Tender* and both the takeover premium and target announcement returns. In addition, the takeover premium and announcement returns for the target, the acquirer, and a portfolio of the target and the acquirer are all positively (negatively) correlated with the use of cash (stock) in financing the deal. There is also a significant, negative correlation between *Same_Ind* and both the takeover premium and target announcement returns, suggesting that acquirers pay less in undiversified deals.

Table 3.3
Descriptive statistics and correlations

Panel A: Descriptive statistics

variable	N	mean	sd	min	p25	p50	p75	max
Deal outcomes								
Prem_4w	3,789	0.428	0.397	-0.341	0.185	0.350	0.583	2.138
Prem_Schwert	3,789	0.308	0.489	-1.041	0.027	0.274	0.553	1.961
Tar_Ret	3,789	0.218	0.230	-0.210	0.063	0.177	0.325	1.161
Acq_Ret	2,292	-0.013	0.062	-0.222	-0.043	-0.009	0.016	0.168
Combined_Ret	2,292	0.017	0.063	-0.160	-0.016	0.009	0.045	0.234
Terminated	3,789	0.141	0.348	0.000	0.000	0.000	0.000	1.000
Renegotiated	2,818	0.037	0.189	0.000	0.000	0.000	0.000	1.000
GW_Impairment	2,226	0.154	0.361	0.000	0.000	0.000	0.000	1.000
Information asymmetry proxies								
Tar_Vol	3,789	0.033	0.019	0.009	0.019	0.028	0.041	0.104
Tar_BidAsk	3,789	0.043	0.026	0.011	0.024	0.036	0.055	0.142
Tar_R&D	3,789	0.254	0.435	0.000	0.000	0.000	1.000	1.000
Target characteristics								
Tar_Size	3,789	1,018	3,004	5	49	162	622	23,094
Tar_MTB	3,789	2.460	2.938	-5.064	1.110	1.691	2.766	18.549
Tar_Lev	3,789	0.208	0.202	0.000	0.032	0.156	0.331	0.860
Tar_ROE	3,789	-0.021	0.474	-2.711	-0.022	0.079	0.139	1.330
Deal characteristics								
Tender	3,789	0.174	0.379	0.000	0.000	0.000	0.000	1.000
Competition	3,789	0.094	0.292	0.000	0.000	0.000	0.000	1.000
Toehold	3,789	0.040	0.196	0.000	0.000	0.000	0.000	1.000
Hostile	3,789	0.073	0.259	0.000	0.000	0.000	0.000	1.000
Cash	3,789	0.301	0.459	0.000	0.000	0.000	1.000	1.000
Stock	3,789	0.395	0.489	0.000	0.000	0.000	1.000	1.000
Same_Ind	3,789	0.672	0.470	0.000	0.000	1.000	1.000	1.000
Acquirer characteristics								
Acq_Size	2,221	13845	35207	24	461	1,699	7,591	197,000
Acq_MTB	2,219	3.250	2.999	0.361	1.544	2.265	3.759	18.360
Acq_Lev	2,212	0.211	0.170	0.000	0.077	0.185	0.303	0.771
Acq_ROE	2,221	0.111	0.203	-0.932	0.072	0.123	0.178	0.921

Table 3.3 (continued)

Panel B: Spearman's rank correlation (upper right) and Pearson's correlation coefficients (lower left)

		1	2	3	4	5	6	7	8	9	10	11
1	Prem_4w		**0.45**	**0.54**	**-0.04**	**0.10**	-0.01	**-0.14**	-0.03	**0.24**	**0.20**	**0.15**
2	Prem_Schwert	**0.46**		**0.43**	**0.06**	**0.13**	**-0.08**	**-0.06**	0.03	**0.17**	**0.15**	**0.15**
3	Tar_Ret	**0.54**	**0.46**		**0.10**	**0.36**	**-0.07**	**-0.05**	**0.04**	**0.13**	**0.12**	**0.15**
4	Acq_Ret	-0.03	**0.06**	**0.10**		**0.75**	-0.03	**-0.04**	0.00	0.01	0.00	-0.03
5	Combined_Ret	**0.08**	**0.11**	**0.31**	**0.75**		**0.05**	**-0.04**	0.00	**-0.07**	**-0.06**	**-0.05**
6	Terminated	-0.01	**-0.09**	**-0.07**	-0.03	**0.04**		-0.01	**-0.16**	0.02	-0.01	**-0.04**
7	Renegotiated	**-0.12**	**-0.06**	**-0.05**	**-0.04**	-0.03	-0.01		0.01	**0.06**	**0.05**	-0.01
8	GW_Impairment	**-0.04**	**0.04**	0.02	0.00	0.01	**-0.16**	0.01		0.01	**0.06**	**0.07**
9	Tar_Vol	**0.26**	**0.18**	**0.16**	-0.01	**-0.08**	0.02	**0.06**	0.01		**0.89**	**0.35**
10	Tar_BidAsk	**0.22**	**0.16**	**0.15**	-0.02	**-0.07**	-0.01	**0.05**	**0.06**	**0.89**		**0.40**
11	Tar_R&D	**0.15**	**0.15**	**0.16**	**-0.05**	**-0.05**	**-0.04**	-0.01	**0.07**	**0.35**	**0.40**	
12	Tar_Size	**-0.18**	**-0.13**	**-0.12**	**-0.13**	-0.01	0.00	-0.02	**0.13**	**-0.47**	**-0.36**	**-0.04**
13	Tar_MTB	0.01	**-0.12**	**-0.04**	**-0.07**	**-0.07**	-0.01	0.00	**0.05**	**0.07**	**0.11**	**0.22**
14	Tar_Lev	**-0.05**	-0.02	**-0.06**	0.02	**0.05**	**0.05**	0.02	-0.02	**-0.07**	**-0.09**	**-0.28**
15	Tar_ROE	**-0.08**	**-0.12**	**-0.06**	**-0.04**	**0.04**	-0.01	0.00	-0.01	**-0.29**	**-0.30**	**-0.25**
16	Tender	**0.15**	**0.16**	**0.21**	**0.12**	**0.13**	**-0.04**	**-0.03**	0.03	**0.09**	**0.07**	**0.11**
17	Competition	**0.10**	0.02	**-0.06**	0.01	**0.04**	**0.35**	-0.02	**-0.08**	**-0.04**	**-0.07**	-0.02
18	Toehold	-0.02	-0.02	**-0.04**	0.01	0.01	**0.10**	**0.06**	-0.01	0.02	0.01	-0.01
19	Hostile	0.03	0.00	0.00	0.03	**0.12**	**0.54**	-0.02	**-0.10**	**-0.06**	**-0.08**	-0.02
20	Cash	**0.11**	**0.14**	**0.24**	**0.19**	**0.14**	0.01	**-0.07**	**0.05**	**0.05**	**0.06**	**0.16**
21	Stock	**-0.05**	**-0.09**	**-0.18**	**-0.15**	**-0.18**	**-0.05**	**0.04**	**-0.06**	**0.06**	**0.06**	-0.01
22	Same_Ind	**-0.03**	**-0.05**	**-0.04**	-0.03	-0.01	**-0.04**	-0.01	-0.01	**-0.10**	**-0.08**	-0.03

Table 3.3 (continued)

		12	13	14	15	16	17	18	19	20	21	22
1	Prem_4w	**-0.17**	**-0.04**	**-0.06**	**-0.09**	**0.17**	**0.10**	-0.01	**0.05**	**0.14**	**-0.08**	**-0.03**
2	Prem_Schwert	**-0.11**	**-0.12**	-0.02	**-0.13**	**0.18**	**0.03**	-0.02	0.01	**0.16**	**-0.09**	**-0.06**
3	Tar_Ret	**-0.10**	**-0.05**	**-0.08**	**-0.07**	**0.22**	**-0.06**	**-0.03**	0.02	**0.25**	**-0.18**	**-0.04**
4	Acq_Ret	**-0.11**	**-0.08**	0.01	-0.03	**0.12**	0.00	0.01	0.02	**0.22**	**-0.16**	**-0.05**
5	Combined_Ret	-0.01	**-0.09**	**0.04**	0.03	**0.13**	**0.04**	0.01	**0.13**	**0.15**	**-0.18**	-0.02
6	Terminated	0.00	**-0.06**	**0.06**	**-0.03**	**-0.04**	**0.35**	**0.10**	**0.54**	0.01	**-0.05**	**-0.04**
7	Renegotiated	-0.02	0.02	0.01	0.03	**-0.03**	-0.02	**0.06**	-0.02	**-0.07**	**0.04**	-0.01
8	Impairment	**0.13**	**0.08**	-0.03	0.01	0.03	**-0.08**	-0.01	**-0.10**	**0.05**	**-0.06**	-0.01
9	Tar_Vol	**-0.47**	0.00	**-0.13**	**-0.33**	**0.09**	**-0.04**	0.02	**-0.06**	**0.05**	**0.06**	**-0.10**
10	Tar_BidAsk	**-0.35**	**0.05**	**-0.16**	**-0.34**	**0.07**	**-0.07**	0.01	**-0.08**	**0.06**	**0.06**	**-0.08**
11	Tar_R&D	**-0.04**	**0.24**	**-0.34**	**-0.26**	**0.11**	-0.02	-0.01	-0.02	**0.16**	-0.01	-0.03
12	Tar_Size		**0.41**	**0.14**	**0.26**	-0.02	**0.06**	-0.02	**0.06**	**-0.08**	-0.02	**0.04**
13	Tar_MTB	**0.27**		**-0.05**	**0.20**	-0.01	**-0.03**	-0.01	**-0.04**	**-0.03**	**0.06**	**-0.06**
14	Tar_Lev	**0.13**	-0.01		**0.10**	-0.01	**0.07**	**0.04**	**0.09**	**-0.13**	**-0.12**	0.00
15	Tar_ROE	**0.19**	**-0.15**	**0.04**		**-0.04**	-0.01	**-0.03**	0.01	**-0.08**	**0.03**	-0.02
16	Tender	-0.03	-0.01	0.00	-0.02		**0.14**	**0.05**	**0.12**	**0.42**	**-0.35**	**-0.11**
17	Competition	**0.07**	-0.02	**0.06**	0.02	**0.14**		**0.07**	**0.30**	**0.07**	**-0.10**	0.00
18	Toehold	-0.02	-0.01	**0.04**	0.00	**0.05**	**0.07**		**0.15**	**0.05**	**-0.06**	**-0.06**
19	Hostile	**0.07**	-0.02	**0.07**	**0.03**	**0.12**	**0.30**	**0.15**		**0.09**	**-0.14**	-0.02
20	Cash	**-0.09**	**-0.03**	**-0.11**	-0.02	**0.42**	**0.07**	**0.05**	**0.09**		**-0.53**	**-0.15**
21	Stock	-0.02	**0.06**	**-0.14**	-0.02	**-0.35**	**-0.10**	**-0.06**	**-0.14**	**-0.53**		**0.09**
22	Same_Ind	**0.04**	**-0.04**	0.00	-0.01	**-0.11**	0.00	**-0.06**	-0.02	**-0.15**	**0.09**	

This table presents the descriptive statistics for and the correlation coefficients among the main variables in this study. Panel A reports the descriptive statistics for the sample of 3,789 M&A deals announced between 1986 and 2017. For ease of interpretation, Panel A reports the descriptive statistics for the raw values (in millions of dollars) for both the target's size, *Tar_Size*, and the acquirer's size, *Acq_Size*. It also presents the descriptive statistics for the raw values of the target's stock return volatility, *Tar_Vol*, and bid-ask spread, *Tar_BidAsk*. Panel B reports coefficients for Spearman's (above diagonal) and Pearson's (below diagonal) correlations among the main variables. Bold coefficients indicate that they are statistically significant at *p*-values less than 10% level. All continuous variables are winsorised at the 1% and 99% levels to mitigate the effect of extreme values. Variable definitions are provided in Table 3.1.

3.6 Empirical results

3.6.1 Takeover premium

Table 3.4 reports the OLS regression results of H1, testing the relationship between the target's information asymmetry and the takeover premium. Columns (1)-(3) present the results when estimating the takeover premium using the value-based method (*Prem_4w*). The results in column (1) show that the target's information asymmetry, as proxied by stock return volatility, is positively related to the takeover premium after controlling for target firm-specific and deal-specific characteristics. The coefficient of *Tar_Vol* equals 0.229 and *t*-stat equals 8.702. In terms of the economic significance, the increase in the target's stock return volatility from the bottom to the top decile is associated with an increase in the takeover premium of 2,290 basis points, which constitutes approximately 54% of the sample average premium. Columns (2) and (3) present the results when using the target's bid-ask spread and R&D intensity to proxy for information asymmetry, respectively. The coefficients of both *Tar_BidAsk* and *Tar_R&D* are also positive and statistically significant at the 1% level. These results are consistent with the prediction of H1 that bidders offer larger premiums to target firms with higher ex ante information asymmetry.

Columns (4)-(6) report the results of H1 when the takeover premium is estimated using the market-based method, *Prem_Schwert*. Consistent with the results of using the value-based measure of premium, the coefficients for all proxies of the target's information asymmetry are positive and statistically significant at the 1% level. These results also support the prediction of H1 that the target's information asymmetry is positively associated with the takeover premium. The evidence that bidders offer larger premiums for target firms with high information asymmetry might indicate the bidder's overpayment in corporate takeovers when uncertainty about the target's true value arising from information asymmetry is high.

Table 3.4
OLS regressions of takeover premium

Variables	*Prem_4w*			*Prem_Schwert*		
	1	2	3	4	5	6
Tar_Vol	**0.229*** **			**0.190*** **		
	(8.702)			**(5.806)**		
Tar_BidAsk		**0.172*** **			**0.154*** **	
		(7.202)			**(5.224)**	
Tar_R&D			**0.100*** **			**0.143*** **
			(5.486)			**(6.529)**
Tar_Size	-0.021***	-0.028***	-0.038***	-0.007	-0.013**	-0.021***
	(-4.727)	(-6.517)	(-9.054)	(-1.308)	(-2.371)	(-4.168)
Tar_MTB	0.004	0.005*	0.005**	-0.024***	-0.023***	-0.024***
	(1.459)	(1.791)	(1.993)	(-6.308)	(-6.169)	(-6.468)
Tar_Lev	-0.063*	-0.059	-0.008	-0.013	-0.009	0.064
	(-1.737)	(-1.599)	(-0.214)	(-0.302)	(-0.208)	(1.492)
Tar_ROE	0.002	-0.002	-0.005	-0.098***	-0.100***	-0.093***
	(0.107)	(-0.094)	(-0.250)	(-3.787)	(-3.842)	(-3.649)
Tender	0.089***	0.093***	0.094***	0.144***	0.147***	0.142***
	(4.489)	(4.640)	(4.681)	(6.363)	(6.434)	(6.248)
Competition	0.143***	0.147***	0.146***	0.024	0.028	0.026
	(4.368)	(4.469)	(4.469)	(0.726)	(0.848)	(0.812)
Toehold	-0.064**	-0.063**	-0.057*	-0.059	-0.058	-0.053
	(-2.167)	(-2.111)	(-1.932)	(-1.431)	(-1.413)	(-1.299)
Hostile	0.002	0.002	-0.003	-0.009	-0.009	-0.014
	(0.098)	(0.081)	(-0.132)	(-0.313)	(-0.312)	(-0.478)
Cash	0.036**	0.035**	0.031*	0.082***	0.082***	0.073***
	(2.014)	(1.992)	(1.711)	(4.035)	(3.995)	(3.527)
Stock	-0.010	-0.010	-0.006	0.001	-0.000	0.001
	(-0.589)	(-0.604)	(-0.347)	(0.030)	(-0.011)	(0.050)
Same_Ind	0.006	0.003	-0.004	-0.027	-0.029*	-0.036**
	(0.440)	(0.224)	(-0.315)	(-1.606)	(-1.727)	(-2.143)
Constant	0.319***	0.384***	0.456***	0.196***	0.245***	0.302***
	(7.399)	(9.177)	(11.208)	(3.589)	(4.641)	(5.867)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	3,789	3,789	3,789	3,789
R-squared	0.117	0.110	0.106	0.116	0.114	0.120

This table presents the results of testing H1, examining the relation between the target's information asymmetry and the takeover premium. *Prem_4w* is the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. *Prem_Schwert* is the cumulative daily abnormal returns of each target firm over a window of trading days starting from -63 to +126 relative to the deal announcement day (0). Normal returns for each target firm are estimated using the market model over a window of trading days ranges from -316 to -64 relative to the deal announcement day (0), and using each target daily actual returns adjusted by dividends and the CRSP value-weighted returns, including dividends, as the market index. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

The results of Table 3.4 also show that some target firm-specific and deal-specific characteristics are related to the takeover premium. Consistent with the literature (e.g., Eckbo, 2009; Alexandridis et al., 2013), the results demonstrate that there is a negative and statistically significant relation between the size of the target firm and the takeover premium, suggesting that small (large) target firms receive larger (lower) premiums. One possible explanation is that smaller target firms have higher levels of information asymmetry, and this might lead to the acquirers' overestimation of these firms and, consequently, overpaying to them. Alternatively, Alexandridis et al. (2013) argue that acquirers pay less for larger targets due to the high complexity associated with large targets. Consistent with prior studies (e.g., Schwert, 1996; Betton et al., 2008), the coefficient of *Tender* in all models are positive and statistically significant, suggesting that the premium is higher when the deal is structured as a tender offer. In addition, the value-based premium is positively associated with *Competition*, suggesting that the existence of multiple bidders contesting over the target firm increases the premium. Consistent with the evidence in Betton and Eckbo (2000), there is also a negative association between *Toehold* and the takeover premium. Moreover, the results show that the premium increases in cash offers but decreases in stock offers, consistent with the literature (e.g., Wansley et al., 1983).

3.6.2 Stock market reaction to M&A announcements: Target, acquirer, and combined returns

In the previous section, this study documents that when the target's information asymmetry increases, the takeover premium increases. In this section, this study turns to test whether the market reaction to M&A announcements is influenced by the target's information asymmetry. Table 3.5 reports the OLS regression results of estimating Eq. (1) when the dependent variable is *Tar_Ret*, *Acq_Ret*, or *Combined_Ret*.

Columns (1)-(3) present the results of testing H2, examining the association between the target's information asymmetry and target announcement returns. The full sample of 3,789 M&A deals is used in the analysis. This study predicts that target announcement returns are higher in deals involving target firms with high levels of ex ante information asymmetry. That is, target shareholders would benefit from the target's information asymmetry by receiving larger premiums and, therefore, positively react to M&A announcements. Consistent with this prediction, the results in columns (1)-(3) show that the association between all three proxies of the target's information asymmetry

and target announcement returns are positive and statistically significant. The effect of the target's information asymmetry on target announcement returns is also economically significant. For instance, results of column (1) show that the increase in the target's stock return volatility from the bottom to the top decile is associated with an increase in target announcement returns of 850 basis points, which constitutes 39% of the positive announcement returns for the average target firm in the sample of this study. Thus, the results suggest that shareholders of target firms with high ex ante information asymmetry earn more around the announcement of M&A deals.

Turning to H3, columns (4)-(6) present the results of examining the association between the target's information asymmetry and acquirer announcement returns. The sample in these analyses consists of 2,292 deals with available data about acquirer announcement returns. Consistent with the prediction of H3, the results show that the three proxies of the target's information asymmetry are negatively associated with acquirer announcement returns. All coefficients are statistically significant at the 1 % level. For example, the coefficient of the target's stock return volatility in column (4) equals -0.018 with *t*-stat equals -3.249. In terms of the economic significance, the change in the target's stock return volatility from the bottom to the highest decile is associated with a decrease in acquirer announcement returns of 180 basis points, which is equivalent to about 138% of the sample mean acquirer announcement returns. These results suggest that acquirer announcement returns are lower in M&A deals involving targets with higher ex ante information asymmetry. This might indicate that bidder shareholders perceive the announcement of M&A deals in a more negative way, probably due to the potential bidder's overpayment to target firms having high levels of ex ante information asymmetry.

The results of H4 examining the association between the target's information asymmetry and combined announcement returns for the portfolio of the target and the acquirer are reported in columns (7)-(9). Consistent with the prediction of H4, the results reveal that all proxies of information asymmetry are negatively associated with combined announcement returns. The coefficients of both the target's stock return volatility and bid-ask spread are statistically significant at the 1% level, and the coefficient of R&D intensity is statistically significant at the 5% level. These results support the prediction of the negative effect of the target's information asymmetry on the efficiency of M&A deals, as represented by the value-weighted combined announcement returns for shareholders of both the target and the acquirer.

Table 3.5
OLS regressions of stock market reaction to M&A announcements

Variables	*Tar_Ret*			*Acq_Ret*			*Combined_Ret*		
	1	2	3	4	5	6	7	8	9
Tar_Vol	**0.085*** **			**-0.018*** **			**-0.016*** **		
	(5.771)			**(-3.249)**			**(-2.974)**		
Tar_BidAsk		**0.056*** **			**-0.017*** **			**-0.014*** **	
		(4.230)			**(-3.483)**			**(-2.929)**	
Tar_R&D			**0.055*** **			**-0.012*** **			**-0.007** **
			(5.739)			**(-3.347)**			**(-2.027)**
Tar_Size	-0.010***	-0.013***	-0.016***	-0.006***	-0.006***	-0.005***	-0.003***	-0.002***	-0.001*
	(-3.990)	(-5.546)	(-7.251)	(-6.450)	(-6.439)	(-5.727)	(-3.000)	(-2.699)	(-1.851)
Tar_MTB	-0.002*	-0.002	-0.002*	-0.000	-0.000	-0.000	-0.001	-0.001*	-0.001*
	(-1.653)	(-1.296)	(-1.652)	(-0.695)	(-0.714)	(-0.707)	(-1.622)	(-1.685)	(-1.846)
Tar_Lev	-0.028	-0.026	0.003	0.015**	0.014**	0.008	0.012*	0.012*	0.008
	(-1.461)	(-1.367)	(0.131)	(2.147)	(2.095)	(1.123)	(1.730)	(1.681)	(1.069)
Tar_ROE	0.000	-0.002	0.001	-0.004	-0.004	-0.004	0.004	0.004	0.004
	(0.045)	(-0.193)	(0.104)	(-0.948)	(-0.988)	(-0.937)	(0.941)	(0.951)	(1.106)
Tender	0.085***	0.087***	0.085***	0.008**	0.008**	0.008**	0.013***	0.013***	0.012***
	(6.980)	(7.098)	(6.968)	(2.392)	(2.370)	(2.399)	(3.360)	(3.316)	(3.285)
Competition	-0.053***	-0.051***	-0.052***	0.001	0.000	0.001	-0.000	-0.001	-0.001
	(-4.333)	(-4.184)	(-4.267)	(0.155)	(0.057)	(0.113)	(-0.091)	(-0.177)	(-0.135)
Toehold	-0.053***	-0.052***	-0.050***	-0.000	-0.000	0.001	-0.006	-0.006	-0.006
	(-3.555)	(-3.511)	(-3.391)	(-0.054)	(-0.043)	(0.095)	(-0.887)	(-0.878)	(-0.806)
Hostile	0.016	0.016	0.014	0.004	0.004	0.005	0.026***	0.026***	0.026***
	(1.353)	(1.321)	(1.177)	(0.823)	(0.802)	(0.940)	(4.829)	(4.810)	(4.882)
Cash	0.059***	0.060***	0.056***	0.019***	0.019***	0.019***	0.007**	0.007**	0.008**
	(5.535)	(5.523)	(5.139)	(5.671)	(5.706)	(5.906)	(2.090)	(2.113)	(2.170)
Stock	-0.023***	-0.022**	-0.022**	-0.006*	-0.006*	-0.006*	-0.013***	-0.013***	-0.013***
	(-2.608)	(-2.571)	(-2.556)	(-1.825)	(-1.776)	(-1.843)	(-3.851)	(-3.825)	(-3.896)
Same_Ind	-0.002	-0.004	-0.006	-0.002	-0.002	-0.001	0.000	0.000	0.001
	(-0.291)	(-0.478)	(-0.791)	(-0.548)	(-0.563)	(-0.325)	(0.125)	(0.134)	(0.358)
Constant	0.182***	0.210***	0.230***	0.020*	0.016*	0.009	0.040***	0.037***	0.030***
	(7.423)	(8.906)	(10.110)	(1.955)	(1.700)	(0.927)	(3.696)	(3.482)	(2.908)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	3,789	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.142	0.138	0.143	0.091	0.091	0.092	0.090	0.089	0.088

This table presents the results of testing H2, H3, and H4, examining the relation between the target's information asymmetry and the market reaction to the announcement of M&A transactions. *Tar_Ret* (*Acq_Ret*) is target (acquirer) announcement returns and estimated as cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each target (acquirer) are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to estimate the market model. *Combined_Ret* is cumulative abnormal returns of the value-weighted portfolio of the target and the acquirer that are estimated using the market model over the 3-day event window (-1, +1) where day 0 is the day of the deal announcement. The weights for both the target and the acquirer are based on their relative market values three months (the trading day -64) prior to the deal announcement date. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

The results in Table 3.5 also show that some target firm-specific and deal-specific characteristics are associated with target returns, acquirer returns, and combined returns. Target size is negatively associated with *Tar_Ret*, *Acq_Ret*, and *Combined_Ret*, suggesting that takeover gains for the two participants are higher in deals involving smaller target firms. This result is consistent with prior studies reporting a negative relation between target size and target announcement returns (e.g., Schwert, 2000; Martin

& Shalev, 2017). It is also consistent with Alexandridis et al. (2013), who show that despite the larger premium acquirers pay for smaller target firms, returns for bidder shareholders are higher in deals of these firms. The results also reveal that takeover gains for both the target and the acquirer are higher in tender offers than in mergers. Moreover, consistent with prior studies (e.g., Wansley et al., 1983; Huang & Walkling, 1987; Travlos, 1987; Chemmanur et al., 2009), takeover gains for the two deal participants are higher (lower) in cash (stock) offers.

3.6.3 Deal termination

Having documented the association between the target's information asymmetry and the takeover premium as well as the market reaction to the announcement of M&A deals, this study turns to examine whether the target's information asymmetry affects the ultimate outcome of the deal (i.e., whether the deal is completed or terminated). Table 3.6 reports the logistic regression results of estimating Eq. (1) when the dependent variable is *Terminated* that equals one if the announced deal is ultimately terminated, and zero otherwise. Columns (1)-(3) present the results of examining the likelihood of the deal termination with the three different proxies of the target's information asymmetry. The sample used in these analyses consists of 3,789 deals, which is divided into 3,254 completed and 535 terminated deals. The Pseudo *R-squared* approximately equals 34%, which is comparable to other studies and suggests that the model is significant in explaining the likelihood of the deal termination.

Column (1) of Table 3.6 shows that the target's stock return volatility is positively and significantly associated with the likelihood that the deal is terminated (coefficient = 0.822 and *z*-stat = 3.432). This supports the prediction of H5 that the likelihood of terminating M&A deals increases when target firms have higher levels of ex ante information asymmetry. Column (2) presents the results when using the target's bid-ask spread to proxy for information asymmetry. The results also support H5 (coefficient = 0.452 and *z*-stat = 2.019). The coefficient of *Tar_R&D* in column (3) is negative, which is inconsistent with the prediction of H5, but insignificant. One possible explanation is that R&D intensity might reflect the effect of other factors in addition to the target's information asymmetry. Consistent with this, Phillips and Zhdanov (2013) find that target firms with high levels of R&D are more attractive for acquiring firms (i.e., firms with high R&D intensity become targets in the M&A market). Therefore, the deal might be

attractive to be completed even with the potential risk of overpayment associated with information asymmetry of the high levels of R&D.

Table 3.6
Logistic regressions of the likelihood of deal termination

Variables	1	2	3
Tar_Vol	**0.822*** **		
	(3.432)		
Tar_BidAsk		**0.452** **	
		(2.019)	
Tar_R&D			**-0.206**
			(-1.361)
Tar_Size	-0.008	-0.045	-0.079**
	(-0.190)	(-1.120)	(-2.075)
Tar_MTB	-0.000	0.006	0.020
	(-0.024)	(0.305)	(1.033)
Tar_Lev	0.279	0.292	0.187
	(0.973)	(1.013)	(0.605)
Tar_ROE	-0.085	-0.111	-0.185
	(-0.659)	(-0.862)	(-1.387)
Tender	-2.155***	-2.145***	-2.118***
	(-7.668)	(-7.622)	(-7.470)
Competition	2.215***	2.229***	2.229***
	(14.243)	(14.284)	(14.271)
Toehold	0.163	0.176	0.193
	(0.602)	(0.650)	(0.710)
Hostile	4.211***	4.197***	4.193***
	(18.566)	(18.545)	(18.365)
Cash	-0.096	-0.094	-0.072
	(-0.573)	(-0.561)	(-0.429)
Stock	-0.049	-0.042	-0.012
	(-0.327)	(-0.281)	(-0.081)
Same_Ind	-0.351***	-0.365***	-0.390***
	(-2.856)	(-2.975)	(-3.160)
Constant	-1.989***	-1.665***	-1.375***
	(-4.313)	(-3.660)	(-3.165)
Year FE	Yes	Yes	Yes
N	3,789	3,789	3,789
Pseudo R-squared	0.342	0.340	0.339

This table presents the results of the logistic regressions testing H5, examining the relation between the target's information asymmetry and the likelihood of the deal termination. The dependent variable is *Terminated* that is defined as an indicator variable that equals one if the announced deal is terminated, and zero otherwise. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *z*-statistics are reported under coefficients (in parentheses). Standard errors are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Table 3.6 also shows that the coefficient of *Tender* is negative and statistically significant, suggesting that deals in which bidders bypass the target's board of directors and offer a price directly to target shareholders are less likely to be terminated. This might be consistent with the prior literature showing that tender offers signal for the high demand for the target's stock and, therefore, raises the takeover premium (e.g., Betton et al., 2008; Offenberg & Pirinsky, 2015). The coefficient of *Same_Ind* is negative and statistically significant, indicating that the likelihood of terminating M&A deals is lower when both the target and the acquirer belong to the same industry. On the other hand, both *Competition* and *Hostile* are positively associated with the likelihood of the deal termination.

Overall, the results in Table 3.6 support the prediction that the likelihood of terminating M&A deals is higher when deals involve target firms with high ex ante information asymmetry. This might indicate that, by getting access to more private information during the transactional due diligence stage, bidders might discover material adverse risks in deals involving target firms with high ex ante information asymmetry. Thus, bidders who initially overestimated target firms with high information asymmetry might make rational decisions of terminating deals to avoid the risk of overpayment to target firms.

3.6.4 Downward renegotiation of the initial deal price

Instead of terminating the deal, the bidder might decide to continue in the deal but after downward renegotiating the initial bid price (i.e., decreasing the initial offer price agreed upon on the acquisition announcement date). This study investigates whether the target's information asymmetry is associated with the likelihood of the downward renegotiation of the initial deal price. To do so, this study uses the sample of only completed deals (i.e., after excluding terminated deals) so that both the initial and final offer prices would be available. The sample used in this test is reduced to 2,406 deals because of excluding terminated deals as well as deals with missing data about the initial offer price in Thomson Reuters Eikon. Only 91 deals of the sample have their initial offer prices downward renegotiated. This shows that the downward renegotiation of the initial deal price is not very common in M&A transactions.

Table 3.7 presents the logistic regression results of estimating Eq. (1) when the dependent variable is *Renegotiated* that equals one when the final offer price paid by the

bidder is lower than its initial offer price, and zero otherwise. Columns (1)-(3) report the results without controlling for year fixed-effects and columns (4)-(6) present the results with controlling for year fixed-effects. Because the value of the dependent variable, *Renegotiated*, does not vary within some years (i.e., all deals are completed without downward renegotiation of the initial deal price), all deals in some years are excluded when controlling for year fixed-effects and, therefore, the sample decreases to 1,935 deals.

The results in columns (1)-(3) show that the coefficients of both the target's stock return volatility and bid-ask spread are positive and statistically significant. For instance, the coefficient of the target's stock return volatility equals 1.151 and the *z*-stat equals 3.053. The coefficient of the target's R&D is positive, but insignificant (coefficient = 0.143 and *z*-stat = 0.503). The results are qualitatively similar after controlling for year fixed-effects in columns (4)-(6). These results are consistent with the prediction of H6 that the target's information asymmetry is positively associated with the likelihood of the downward renegotiation of the initial deal price. This might indicate that some bidders attempt to consider the risk of initial overbidding, arguably arising from targets' high ex ante information asymmetry, by downward renegotiating their initial offer prices.

3.6.5 Goodwill impairment

The previous section documents that bidders are more likely to terminate or downward renegotiate the initial deal price after getting access to private information during transactional due diligence when target firms have high ex ante information asymmetry. Despite this evidence, this study argues that this does not guarantee that all bidders rationally or sufficiently consider the risk of the target's high information asymmetry. This is consistent with Black (1988), who notes that if some bidders rationally behave in valuing target firms, others do not. As illustrated before, there might be principal-agent conflicts on the side of the bidding firm that induce managers to continue in deals despite the high uncertainty arising from information asymmetry of target firms involved in these deals. Moreover, managers might irrationally continue in opaque deals because of their hubris and overconfidence. Therefore, to shed light on the long-term effect of the target's information asymmetry on the performance of the acquiring firm, this study examines the association between the target's information asymmetry and the likelihood of the acquirer's subsequent reporting of goodwill impairment.

Table 3.7
Logistic regressions of the likelihood of deal price downward renegotiation

Variables	1	2	3	4	5	6
Tar_Vol	**1.151*** **			**1.130*** **		
	(3.053)			**(2.613)**		
Tar_BidAsk		**0.873** **			**0.980** **	
		(2.321)			**(2.369)**	
Tar_R&D			**0.143**			**0.166**
			(0.503)			**(0.577)**
Tar_Size	-0.017	-0.063	-0.114	0.042	0.012	-0.050
	(-0.227)	(-0.905)	(-1.637)	(0.533)	(0.163)	(-0.691)
Tar_MTB	-0.066*	-0.059*	-0.048	-0.083**	-0.081**	-0.067
	(-1.854)	(-1.698)	(-1.292)	(-2.022)	(-2.009)	(-1.555)
Tar_Lev	-0.013	0.035	0.161	-0.187	-0.158	0.018
	(-0.025)	(0.069)	(0.293)	(-0.332)	(-0.283)	(0.031)
Tar_ROE	0.230	0.231	0.139	0.116	0.124	0.034
	(1.030)	(1.022)	(0.597)	(0.462)	(0.498)	(0.136)
Tender	-0.848**	-0.803*	-0.730*	-1.055**	-1.042**	-0.983**
	(-1.996)	(-1.897)	(-1.690)	(-2.136)	(-2.118)	(-1.966)
Competition	-0.715	-0.687	-0.681	-1.078	-1.058	-1.027
	(-0.948)	(-0.907)	(-0.900)	(-1.194)	(-1.154)	(-1.152)
Toehold	0.912*	0.940*	1.008**	0.619	0.666	0.687
	(1.774)	(1.846)	(2.009)	(1.087)	(1.203)	(1.220)
Hostile	0.770	0.793	0.731	-0.599	-0.580	-0.667
	(0.927)	(0.962)	(0.897)	(-0.618)	(-0.615)	(-0.709)
Cash	-0.826**	-0.859**	-0.840**	-0.788**	-0.805**	-0.772**
	(-2.365)	(-2.439)	(-2.378)	(-2.189)	(-2.219)	(-2.129)
Stock	0.165	0.183	0.236	-0.079	-0.079	-0.012
	(0.657)	(0.733)	(0.965)	(-0.293)	(-0.292)	(-0.044)
Same_Ind	0.024	-0.005	-0.059	-0.021	-0.041	-0.099
	(0.097)	(-0.021)	(-0.248)	(-0.082)	(-0.167)	(-0.401)
Constant	-3.444***	-3.067***	-2.421***	-0.851	-0.557	-0.069
	(-6.065)	(-5.852)	(-5.232)	(-0.532)	(-0.363)	(-0.047)
Year FE	No	No	No	Yes	Yes	Yes
N	2,406	2,406	2,406	1,935	1,935	1,935
Pseudo R-squared	0.0505	0.0462	0.0394	0.0835	0.0823	0.0748

This table presents the results of logistic regressions testing H6, examining the relation between the target's information asymmetry and the likelihood of the downward renegotiation of the initial deal price. The dependent variable is *Renegotiated* that is defined as an indicator variable that equals one if the deal price that is initially offered by the bidder is downward renegotiated (i.e., the final offer price paid by the bidder is lower than its initial offer price), and zero otherwise. Columns (1)-(3) report the results when controlling for year fixed-effects and columns (4)-(6) present the results with controlling for year fixed-effects. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *z*-statistics are reported under coefficients (in parentheses). Standard errors are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Table 3.8 presents the logistic regression results of estimating Eq. (1) when the dependent variable is *GW_Impairment* that equals one if the bidder reports goodwill impairment in the fiscal year of the deal completion or in any of the subsequent three years of the deal completion year, and zero otherwise. The sample used in this test consists of 1,768 completed deals, of which 342 deals with goodwill impairment. Consistent with the prediction of H7, the results show that the target's information asymmetry, as proxied by stock return volatility and bid-ask spread, is positively associated with the likelihood of the acquirer's subsequent reporting of goodwill impairment. The coefficient of *Tar_R&D* is positive but insignificant. These results show that acquirers of target firms with high ex ante information asymmetry are more likely to report goodwill impairment after the completion of M&A deals. Thus, the results indicate the adverse consequences of information asymmetry of target firms on the long-term performance of acquirers that would, in turn, refer to the initial overestimation of the values of those target firms.

3.7 Robustness tests

3.7.1 Alternative specification and measures of takeover premium

Different specifications and measures of the takeover premium are used to check the robustness of the results of H1. First, some M&A deals in the sample of this study have abnormally small or large premiums. The interpretation of abnormally small or large premiums is not straightforward (e.g., Officer, 2003; Weitzel & Kling, 2018). Therefore, this study follows Raman et al. (2013) and re-examines H1 after excluding all deals with negative or above 200% premiums. The results of these tests are reported in Panel A of Table 3.9. The dependent variable is *Prem_4w* or *Prem_Schwert*. The coefficients for all proxies of the target's information asymmetry are positive and statistically significant. Therefore, the results are robust to excluding deals with abnormally high or low premiums that might be difficult to explain.

Table 3.8
Logistic regressions of the likelihood of the acquirer's subsequent reporting of goodwill impairment

Variables	1	2	3
Tar_Vol	**1.299*** **		
	(4.957)		
Tar_BidAsk		**1.268*** **	
		(4.960)	
Tar_R&D			**0.210**
			(1.302)
Tar_Size	0.259***	0.232***	0.174***
	(5.430)	(4.995)	(3.910)
Tar_MTB	-0.020	-0.020	-0.004
	(-0.848)	(-0.854)	(-0.185)
Tar_Lev	-0.047	-0.047	0.043
	(-0.148)	(-0.150)	(0.136)
Tar_ROE	0.006	0.023	-0.104
	(0.037)	(0.146)	(-0.636)
Tender	0.279	0.279	0.336*
	(1.432)	(1.435)	(1.742)
Competition	-0.534	-0.514	-0.535
	(-1.527)	(-1.466)	(-1.527)
Toehold	0.557	0.540	0.617
	(1.439)	(1.381)	(1.552)
Hostile	-0.478	-0.537	-0.569
	(-0.699)	(-0.765)	(-0.815)
Cash	-0.077	-0.094	-0.041
	(-0.439)	(-0.540)	(-0.239)
Stock	-0.052	-0.068	-0.022
	(-0.305)	(-0.399)	(-0.131)
Same_Ind	-0.057	-0.055	-0.119
	(-0.393)	(-0.380)	(-0.828)
Constant	-5.732***	-5.628***	-4.848***
	(-5.037)	(-4.951)	(-4.298)
Year FE	Yes	Yes	Yes
N	1,768	1,768	1,768
Pseudo R-squared	0.113	0.113	0.101

This table presents the results of logistic regressions testing H7, examining the relation between the target's information asymmetry and the likelihood of the acquirer's subsequent reporting of goodwill impairments. The dependent variable is *GW_Impairment* that is defined as an indicator variable that equals one if the bidder reports goodwill impairment in the fiscal year of the deal completion or any of the subsequent three years of the deal completion year, and zero otherwise. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *z*-statistics are reported under coefficients (in parentheses). Standard errors are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Second, prior studies show that using the target's share price one month prior to the acquisition announcement date as a benchmark in estimating the takeover premium might provide an underestimated estimation of the premium. For instance, Schwert (1996) finds that the target's share price starts to increase around two months (about trading day -42) before the acquisition announcement date. Eaton et al. (2019) provide evidence that the use of the target's share price around four or five months prior to the acquisition announcement date provides a more accurate estimation of the takeover premium. Therefore, to consider the additional cost acquirers might incur because of the target's pre-acquisition stock price run-up that might arise from the target's insider trading or leaking news about the deal (Meulbroek, 1992; Schwert, 1996; Meulbroek & Hart, 1997), this study uses four additional measures for the takeover premium. These measures are *Prem42d*, *Prem64d*, *Prem85d*, and *Prem105d* that are defined as the price per share offered by the acquirer to target shareholders divided by the target's closing share price (adjusted by stock splits) two, three, four, and five months, respectively, prior to the deal announcement date (specifically, the target's share price on the trading day -42, -64, -85, and -105), and then subtracting one. The results of using these alternative measures when using the target's stock return volatility, *Tar_Vol*, to proxy for information asymmetry are reported in Panel B of Table 3.9. The results of H1 in the main analysis are robust to the use of these four alternative measures.[23]

[23] The results of using the target's bid-ask spread, *Tar_BidAsk*, and R&D intensity, *Tar_R&D*, instead of *Tar_Vol*, to proxy for the target's information asymmetry when using alternative takeover premiums are reported in Table A.3.1 in the appendix of this chapter and are consistent with the results of the main analysis.

Table 3.9
Alternative specification and measures of takeover premium

Panel A: Excluding deals with abnormally low or high premiums

Variables	*Prem_4w*			*Prem_Schwert*		
	1	2	3	4	5	6
Tar_Vol	**0.267*** **			**0.445*** **		
	(12.200)			**(15.650)**		
Tar_BidAsk		**0.209*** **			**0.375*** **	
		(10.087)			**(14.672)**	
Tar_R&D			**0.089*** **			**0.149*** **
			(5.917)			**(7.635)**
Tar_Size	-0.012***	-0.020***	-0.033***	-0.003	-0.015***	-0.037***
	(-3.236)	(-5.468)	(-9.050)	(-0.600)	(-3.282)	(-8.466)
Tar_MTB	0.001	0.002	0.004*	-0.011***	-0.010***	-0.008**
	(0.576)	(1.011)	(1.765)	(-3.645)	(-3.297)	(-2.489)
Tar_Lev	-0.025	-0.021	0.023	-0.015	-0.003	0.071*
	(-0.819)	(-0.686)	(0.706)	(-0.386)	(-0.074)	(1.788)
Tar_ROE	-0.019	-0.022	-0.033**	-0.120***	-0.123***	-0.144***
	(-1.313)	(-1.521)	(-2.245)	(-5.357)	(-5.383)	(-6.183)
Tender	0.068***	0.072***	0.076***	0.062***	0.069***	0.077***
	(4.061)	(4.277)	(4.469)	(3.162)	(3.437)	(3.761)
Competition	0.124***	0.131***	0.128***	0.051*	0.061**	0.057**
	(4.812)	(5.031)	(4.947)	(1.762)	(2.119)	(2.014)
Toehold	-0.033	-0.031	-0.024	0.017	0.019	0.024
	(-1.183)	(-1.087)	(-0.862)	(0.466)	(0.517)	(0.639)
Hostile	0.003	0.002	-0.004	0.012	0.014	0.004
	(0.125)	(0.116)	(-0.198)	(0.513)	(0.575)	(0.157)
Cash	0.006	0.005	0.003	0.009	0.007	0.011
	(0.380)	(0.309)	(0.201)	(0.520)	(0.411)	(0.574)
Stock	-0.005	-0.007	-0.001	0.003	0.001	0.013
	(-0.397)	(-0.497)	(-0.059)	(0.147)	(0.050)	(0.722)
Same_Ind	0.003	-0.000	-0.009	-0.007	-0.010	-0.027*
	(0.223)	(-0.002)	(-0.781)	(-0.459)	(-0.710)	(-1.877)
Constant	0.324***	0.395***	0.486***	0.225***	0.326***	0.496***
	(8.208)	(10.298)	(12.995)	(4.738)	(7.029)	(10.640)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3,472	3,472	3,472	2,944	2,944	2,944
R-squared	0.156	0.145	0.129	0.232	0.218	0.179

Panel B: Alternative measures of takeover premium

Variables	*Prem42d*	*Prem64d*	*Prem85d*	*Prem105d*
	1	2	3	4
Tar_Vol	**0.210*** **	**0.223*** **	**0.191*** **	**0.173*** **
	(6.385)	**(6.269)**	**(5.154)**	**(4.088)**
Tar_Size	-0.012*	-0.014**	-0.017**	-0.021***
	(-1.944)	(-2.114)	(-2.375)	(-2.717)
Tar_MTB	0.004	0.005	0.006	0.011**
	(1.027)	(1.212)	(1.223)	(1.990)
Tar_Lev	-0.136***	-0.103**	-0.129***	-0.138**
	(-3.116)	(-2.067)	(-2.602)	(-2.440)
Tar_ROE	-0.014	-0.004	0.016	0.033

	(-0.555)	(-0.155)	(0.610)	(1.036)
Tender	0.042*	0.036	0.041	0.030
	(1.673)	(1.317)	(1.455)	(0.922)
Competition	0.018	0.028	0.062	0.052
	(0.504)	(0.737)	(1.481)	(1.139)
Toehold	-0.035	-0.014	-0.009	-0.002
	(-0.758)	(-0.267)	(-0.169)	(-0.028)
Hostile	0.145***	0.135***	0.103**	0.134***
	(3.517)	(3.051)	(2.267)	(2.647)
Cash	0.016	0.035	0.019	0.009
	(0.694)	(1.414)	(0.756)	(0.295)
Stock	-0.023	-0.032	-0.037	-0.051*
	(-1.036)	(-1.307)	(-1.525)	(-1.870)
Same_Ind	-0.009	0.002	0.007	0.008
	(-0.478)	(0.097)	(0.332)	(0.324)
Constant	0.576***	0.553***	0.572***	0.657***
	(5.535)	(4.847)	(5.080)	(4.739)
Year FE	Yes	Yes	Yes	Yes
N	3,789	3,789	3,788	3,788
R-squared	0.070	0.067	0.068	0.064

This table presents the results of using alternative specifications and measures of the takeover premium when testing H1 and using the target's stock return volatility to proxy for information asymmetry.

Panel A presents the results of regressions using *Prem_4w* and *Prem_Schwert* after excluding deals with negative and above 200% premiums. *Prem_4w* is the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. *Prem_Schwert* is cumulative daily abnormal returns of each target firm over a window of trading days starting from -63 to +126 relative to the deal announcement day (0). Normal returns for each target firm are estimated using the market model over a window of trading days ranges from -316 to -64 relative to the announcement day (0), and using each target daily actual returns adjusted by dividends and the CRSP value-weighted returns, including dividends, as the market index.

Panel B reports the results of using four additional measures of the takeover premium. *Prem42d, Prem64d, Prem85d, or Prem105d* is defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price on the trading day -42, -64, -85, or -105 prior to the deal announcement date (day 0), minus one.

All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.7.2 Alternative specifications of estimating market reaction to M&A announcements

Two different specifications are used to check the robustness of the results of testing H2, H3, and H4. First, instead of using a 3-day event window around the deal announcement date, this study estimates *Tar_Ret*, *Acq_Ret*, and *Combined_Ret* over a 5-day event window (i.e., from two days before to two days after the deal announcement date). The results are reported in Panel A of Table 3.10 and are similar to those of the main analysis. Therefore, the results of this study are robust to the use of a 5-day event window.

Second, following prior studies (e.g., Moeller et al., 2004; McNichols & Stubben, 2015), this study estimates *Tar_Ret*, *Acq_Ret*, and *Combined_Ret* using the market-adjusted model, instead of the market model, to estimate abnormal returns. According to this method, the market return during the event window is used as the normal or expected return that is directly subtracted from the actual firm's return over the event period to calculate the abnormal return as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - R_{m,t}, \text{ over the event window.}$$

Then abnormal returns are cumulated over the 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). The CRSP value-weighted returns are used as the market index. Therefore, for each target or acquirer, announcement returns equal:

$$Tar\_Ret_i \text{ or } Acq\_Ret_i = \sum_{t=-1}^{1}(R_{i,t} - R_{m,t}),$$

where $R_{i,t}$ is the daily stock return for the target or the acquirer and $R_{m,t}$ is the CRSP daily value-weighted market return, and *t* refers to the day and ranges from one day before (-1) to one day after (+1) the day of the deal announcement (0).

Combined_Ret is estimated as cumulative abnormal returns of the value-weighted portfolios of both the target and the acquirer that are previously estimated using the market-adjusted model over the 3-day event window. The weights for both the target and the acquirer are based on their relative market values three months prior to the deal announcement (specifically, on the trading day -64).

The results of using the market-adjusted model are shown in Panel B of Table 3.10, and they are consistent with the results in the main analysis.

Table 3.10
Alternative specifications of estimating market reaction around M&A announcements

Panel A: Using a 5-day event window

Variables	*Tar_Ret*			*Acq_Ret*			*Combined_Ret*		
	1	2	3	4	5	6	7	8	9
Tar_Vol	**0.089*** **			**-0.017*** **			**-0.015** **		
	(6.026)			**(-2.750)**			**(-2.556)**		
Tar_BidAsk		**0.059*** **			**-0.017*** **			**-0.014** **	
		(4.420)			**(-2.967)**			**(-2.571)**	
Tar_R&D			**0.056*** **			**-0.014*** **			**-0.009** **
			(5.651)			**(-3.580)**			**(-2.273)**
Tar_Size	-0.009***	-0.013***	-0.016***	-0.007***	-0.006***	-0.005***	-0.003***	-0.002***	-0.002*
	(-3.733)	(-5.334)	(-7.076)	(-6.109)	(-6.165)	(-5.584)	(-2.813)	(-2.598)	(-1.889)
Tar_MTB	-0.003**	-0.002*	-0.003**	-0.001	-0.001	-0.001	-0.001*	-0.001**	-0.001**
	(-2.145)	(-1.773)	(-2.087)	(-1.252)	(-1.271)	(-1.150)	(-1.927)	(-1.972)	(-2.017)
Tar_Lev	-0.026	-0.024	0.004	0.011	0.011	0.003	0.010	0.010	0.005
	(-1.356)	(-1.259)	(0.217)	(1.386)	(1.343)	(0.363)	(1.292)	(1.251)	(0.606)
Tar_ROE	0.002	-0.001	0.002	-0.005	-0.005	-0.005	0.003	0.003	0.004
	(0.160)	(-0.087)	(0.181)	(-1.186)	(-1.227)	(-1.293)	(0.776)	(0.775)	(0.846)
Tender	0.085***	0.087***	0.085***	0.010**	0.010**	0.010**	0.013***	0.013***	0.013***
	(6.937)	(7.061)	(6.949)	(2.445)	(2.431)	(2.517)	(3.081)	(3.051)	(3.059)
Competition	-0.055***	-0.053***	-0.053***	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
	(-4.387)	(-4.227)	(-4.319)	(-0.173)	(-0.259)	(-0.204)	(-0.156)	(-0.234)	(-0.191)
Toehold	-0.059***	-0.059***	-0.057***	-0.001	-0.001	0.000	-0.008	-0.008	-0.008
	(-3.859)	(-3.808)	(-3.698)	(-0.131)	(-0.121)	(0.031)	(-0.996)	(-0.988)	(-0.908)
Hostile	0.016	0.016	0.014	0.004	0.004	0.004	0.026***	0.026***	0.026***
	(1.369)	(1.334)	(1.186)	(0.700)	(0.681)	(0.805)	(4.371)	(4.360)	(4.427)
Cash	0.060***	0.060***	0.056***	0.014***	0.014***	0.015***	0.003	0.003	0.003
	(5.572)	(5.561)	(5.176)	(3.742)	(3.777)	(4.047)	(0.769)	(0.793)	(0.914)
Stock	-0.026***	-0.025***	-0.025***	-0.007*	-0.007*	-0.007*	-0.014***	-0.014***	-0.015***
	(-2.901)	(-2.862)	(-2.836)	(-1.878)	(-1.833)	(-1.867)	(-3.884)	(-3.857)	(-3.905)
Same_Ind	-0.004	-0.006	-0.009	-0.001	-0.001	-0.001	0.001	0.001	0.002
	(-0.562)	(-0.757)	(-1.084)	(-0.440)	(-0.456)	(-0.268)	(0.423)	(0.423)	(0.616)
Constant	0.190***	0.219***	0.241***	0.023*	0.020*	0.013	0.043***	0.040***	0.033***
	(7.703)	(9.262)	(10.563)	(1.861)	(1.653)	(1.059)	(3.520)	(3.343)	(2.854)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	3,789	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.143	0.139	0.143	0.079	0.079	0.081	0.080	0.080	0.080

Panel B: Using the market-adjusted model

Variables	*Tar_Ret*			*Acq_Ret*			*Combined_ret*		
	1	2	3	4	5	6	7	8	9
Tar_Vol	**0.086*** **			**-0.016*** **			**-0.014*** **		
	(5.839)			**(-2.954)**			**(-2.634)**		
Tar_BidAsk		**0.058*** **			**-0.015*** **			**-0.012** **	
		(4.316)			**(-3.115)**			**(-2.536)**	
Tar_R&D			**0.056*** **			**-0.009*** **			**-0.005**
			(5.735)			**(-2.716)**			**(-1.442)**
Tar_Size	-0.010***	-0.013***	-0.017***	-0.006***	-0.006***	-0.005***	-0.002***	-0.002**	-0.001*
	(-4.101)	(-5.668)	(-7.407)	(-6.169)	(-6.150)	(-5.496)	(-2.720)	(-2.429)	(-1.679)
Tar_MTB	-0.002	-0.001	-0.002	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001
	(-1.288)	(-0.930)	(-1.266)	(-0.548)	(-0.571)	(-0.612)	(-1.376)	(-1.441)	(-1.642)
Tar_Lev	-0.028	-0.027	0.002	0.014**	0.014**	0.008	0.011	0.011	0.008
	(-1.495)	(-1.400)	(0.098)	(2.056)	(2.007)	(1.191)	(1.582)	(1.538)	(1.079)
Tar_ROE	0.002	-0.001	0.002	-0.003	-0.003	-0.003	0.004	0.004	0.005
	(0.167)	(-0.068)	(0.217)	(-0.736)	(-0.765)	(-0.678)	(1.154)	(1.174)	(1.360)
Tender	0.086***	0.087***	0.085***	0.009**	0.009**	0.009**	0.013***	0.013***	0.013***
	(6.984)	(7.101)	(6.977)	(2.540)	(2.516)	(2.511)	(3.417)	(3.373)	(3.316)
Competition	-0.051***	-0.049***	-0.050***	-0.000	-0.001	-0.000	-0.001	-0.001	-0.001
	(-4.216)	(-4.063)	(-4.140)	(-0.056)	(-0.145)	(-0.096)	(-0.127)	(-0.202)	(-0.168)
Toehold	-0.054***	-0.054***	-0.052***	-0.001	-0.000	0.000	-0.007	-0.007	-0.007
	(-3.610)	(-3.567)	(-3.443)	(-0.076)	(-0.067)	(0.036)	(-0.929)	(-0.922)	(-0.877)
Hostile	0.014	0.014	0.012	0.003	0.003	0.004	0.025***	0.025***	0.025***
	(1.206)	(1.174)	(1.026)	(0.708)	(0.692)	(0.812)	(4.564)	(4.552)	(4.617)
Cash	0.059***	0.059***	0.055***	0.019***	0.019***	0.019***	0.007**	0.007**	0.007**
	(5.478)	(5.464)	(5.080)	(5.621)	(5.649)	(5.793)	(1.997)	(2.015)	(2.028)
Stock	-0.023***	-0.023***	-0.022**	-0.006*	-0.005	-0.006*	-0.013***	-0.012***	-0.013***
	(-2.632)	(-2.597)	(-2.574)	(-1.661)	(-1.618)	(-1.690)	(-3.752)	(-3.732)	(-3.809)
Same_Ind	-0.003	-0.004	-0.007	-0.003	-0.003	-0.002	-0.001	-0.001	-0.000
	(-0.334)	(-0.520)	(-0.839)	(-0.977)	(-0.985)	(-0.771)	(-0.377)	(-0.364)	(-0.167)
Constant	0.182***	0.210***	0.231***	0.019*	0.016	0.009	0.040***	0.037***	0.032***
	(7.393)	(8.886)	(10.122)	(1.841)	(1.598)	(0.918)	(3.666)	(3.471)	(2.980)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	3,789	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.143	0.139	0.143	0.089	0.089	0.088	0.087	0.086	0.085

This table presents the results of testing H2, H3, and H4 when using alternative specifications for estimating the market reaction to M&A announcements. Panel A presents the results when estimating *Tar_Ret*, *Acq_Ret*, and *Combined_Ret* using the market model over a 5-day event window. Panel B reports the results when estimating *Tar_Ret*, *Acq_Ret*, and *Combined_Ret* using the market-adjusted model over a 3-day event window. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.7.3 Excluding terminated deals

This study uses a sample of announced M&A deals in the main analysis (i.e., completed as well as terminated deals) when examining the effects of the target's information asymmetry on the takeover premium and the market reaction to M&A announcements (H1 – H4). As a robustness check, this study re-examines these effects using a sample of only completed deals. Two reasons for this robustness check are: first, this study uses the winner's curse as a basis for its predictions that entails that the primary focus would be on completed deals. Second, using only completed deals excludes the potential effect of the deal status (i.e., whether the deal is completed or terminated) on merger outcomes. The results of re-examining the effects of the target's information asymmetry on the takeover premium and the market reaction to M&A announcements with excluding terminated deals are reported in Table 3.11. The results are consistent with those reported in the main analysis.

Table 3.11

OLS regressions of takeover premium and announcement returns after excluding terminated deals

Variables	*Prem_4w*			*Tar_Ret*			*Acq_Ret*			*Combined_Ret*		
	1	2	3	4	5	6	7	8	9	10	11	12
Tar_Vol	**0.242*** **			**0.096*** **			**-0.014** **			**-0.014** **		
	(9.018)			**(6.083)**			**(-2.440)**			**(-2.515)**		
Tar_BidAsk		**0.182*** **			**0.062*** **			**-0.014*** **			**-0.013** **	
		(7.422)			**(4.334)**			**(-2.711)**			**(-2.531)**	
Tar_R&D			**0.100*** **			**0.052*** **			**-0.011*** **			**-0.010*** **
			(5.400)			**(5.021)**			**(-3.118)**			**(-2.658)**
Tar_Size	-0.021***	-0.028***	-0.039***	-0.010***	-0.014***	-0.017***	-0.005***	-0.005***	-0.004***	-0.002**	-0.002**	-0.001
	(-4.603)	(-6.439)	(-8.835)	(-3.787)	(-5.390)	(-7.085)	(-5.197)	(-5.200)	(-4.626)	(-2.531)	(-2.296)	(-1.564)
Tar_MTB	0.003	0.004	0.005*	-0.003**	-0.003*	-0.003**	-0.001*	-0.001*	-0.001*	-0.001**	-0.001**	-0.001**
	(1.266)	(1.616)	(1.919)	(-2.257)	(-1.863)	(-2.028)	(-1.753)	(-1.754)	(-1.651)	(-2.129)	(-2.165)	(-2.139)
Tar_Lev	-0.054	-0.052	-0.004	-0.017	-0.016	0.010	0.017**	0.017**	0.011	0.018**	0.018**	0.013*
	(-1.410)	(-1.337)	(-0.089)	(-0.818)	(-0.780)	(0.460)	(2.386)	(2.368)	(1.492)	(2.433)	(2.413)	(1.669)
Tar_ROE	-0.004	-0.008	-0.012	-0.007	-0.010	-0.008	-0.005	-0.006	-0.006	0.002	0.002	0.002
	(-0.208)	(-0.413)	(-0.584)	(-0.712)	(-0.981)	(-0.756)	(-1.252)	(-1.302)	(-1.414)	(0.552)	(0.542)	(0.480)
Tender	0.056**	0.061***	0.063***	0.068***	0.071***	0.070***	0.007*	0.006	0.007*	0.010**	0.010**	0.010**
	(2.572)	(2.772)	(2.869)	(4.897)	(5.055)	(4.984)	(1.662)	(1.644)	(1.719)	(2.374)	(2.336)	(2.392)
Competition	0.215***	0.221***	0.214***	-0.066***	-0.065***	-0.067***	0.000	-0.000	0.001	0.003	0.003	0.003
	(5.612)	(5.686)	(5.560)	(-5.001)	(-4.871)	(-5.009)	(0.020)	(-0.019)	(0.077)	(0.396)	(0.364)	(0.443)
Toehold	-0.047	-0.045	-0.033	-0.062***	-0.061***	-0.056***	0.003	0.004	0.003	-0.009	-0.009	-0.009
	(-1.257)	(-1.177)	(-0.877)	(-3.355)	(-3.279)	(-3.019)	(0.486)	(0.502)	(0.484)	(-1.185)	(-1.162)	(-1.203)
Hostile	0.141***	0.136**	0.134**	0.081***	0.079***	0.079***	0.001	0.001	0.001	0.021*	0.021*	0.021*
	(2.617)	(2.459)	(2.371)	(2.748)	(2.664)	(2.635)	(0.134)	(0.143)	(0.103)	(1.771)	(1.769)	(1.737)
Cash	0.041**	0.040**	0.037*	0.055***	0.055***	0.052***	0.019***	0.020***	0.020***	0.005	0.005	0.006
	(2.084)	(2.012)	(1.837)	(4.511)	(4.476)	(4.206)	(5.387)	(5.426)	(5.588)	(1.372)	(1.400)	(1.518)
Stock	-0.015	-0.016	-0.012	-0.031***	-0.031***	-0.031***	-0.007*	-0.006*	-0.007*	-0.015***	-0.015***	-0.015***
	(-0.886)	(-0.930)	(-0.697)	(-3.309)	(-3.292)	(-3.245)	(-1.873)	(-1.828)	(-1.865)	(-4.287)	(-4.257)	(-4.289)
Same_Ind	0.001	-0.003	-0.010	-0.006	-0.008	-0.010	-0.001	-0.001	-0.001	0.000	0.001	0.001
	(0.061)	(-0.207)	(-0.690)	(-0.670)	(-0.903)	(-1.174)	(-0.370)	(-0.370)	(-0.224)	(0.162)	(0.183)	(0.332)
Constant	0.303***	0.371***	0.445***	0.199***	0.230***	0.253***	0.014	0.012	0.006	0.037***	0.035***	0.029***
	(6.286)	(7.862)	(9.632)	(7.165)	(8.575)	(9.667)	(1.087)	(0.938)	(0.476)	(3.452)	(3.307)	(2.855)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,254	3,254	3,254	3,254	3,254	3,254	1,993	1,993	1,993	1,993	1,993	1,993
R-squared	0.129	0.121	0.116	0.151	0.146	0.149	0.096	0.097	0.098	0.088	0.088	0.089

This table presents the results of testing H1, H2, H3, and H4 after excluding terminated deals. *Prem_4w* is the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. *Tar_Ret* (*Acq_Ret*) is target (acquirer) announcement returns and estimated as cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each target (acquirer) are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). *Combined_Ret* is cumulative abnormal returns of the value-weighted portfolios of both the target and the acquirer that are estimated using the market model over the 3-day event window (-1, +1) where day 0 is the day of the deal announcement. The weights for both the target and the acquirer are based on their relative market values three months (the trading day -64) prior to the deal announcement. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors that are doubled (two-way) clustered by both year and target-firm to correct for time-series and cross-section correlations. Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.7.4 Alternative specifications of information asymmetry proxies

In the main analysis, this study follows prior studies (e.g., Kravet, 2014; Chen et al., 2018a) and uses the scaled decile ranks of both the target's stock return volatility and bid-ask spread to mitigate concerns about nonlinearities and measurement errors and, consequently, avoid getting spurious results. As a robustness check, this study re-tests all hypotheses using the raw values of *Tar_Vol* and *Tar_BidAsk*.

In addition, in the main analysis, this study defines *Tar_R&D* as an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 5%, and zero otherwise. As robustness, this study uses seven alternative definitions for the target's R&D intensity as follows:

1) *Tar_R&D_nonmiss*. It is the same as *Tar_R&D* but with excluding deals involving target firms with missing data for R&D expenditures,
2) *Tar_R&D_ratio*. It is the ratio of the target's R&D expenditures to total assets,
3) *Tar_R&D_0*. It is an indicator variable that equals one if the target firm has a positive percentage of R&D to total assets (i.e., higher than 0%), and zero otherwise,
4) *Tar_R&D_1*. It is an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 1%, and zero otherwise,
5) *Tar_R&D_3*. It is an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 3%, and zero otherwise,
6) *Tar_R&D_7*. It is an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 7%, and zero otherwise,
7) *Tar_R&D_10*. It is an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 10%, and zero otherwise.

This study re-estimates all regressions used to test hypotheses using these alternative specifications of measuring the target's information asymmetry. Table 3.12 presents the results of testing H1 when using alternative specifications of measuring the target's information asymmetry, and the dependent variable is *Prem_4w*.[24] The results of this study are robust to the use of the raw values of *Tar_Vol* and *Tar_BidAsk* as well as the alternative specifications of the target's R&D intensity.

[24] The results of testing other hypotheses are reported in Table A.3.2 in the appendix of this chapter. The results are, in general, consistent with the results of the main analysis.

Table 3.12

OLS regressions of takeover premium using alternative specifications of measuring information asymmetry

Variables	1	2	3	4	5	6	7	8	9
Tar_Vol	**3.249*** (6.026)**								
Tar_BidAsk		**1.731*** (4.760)**							
Tar_R&D_nonmiss			**0.085*** (3.554)**						
Tar_R&D_ratio				**0.458*** (4.417)**					
Tar_R&D_0					**0.098*** (6.492)**				
Tar_R&D_1						**0.096*** (6.099)**			
Tar_R&D_3							**0.092*** (5.363)**		
Tar_R&D_7								**0.100*** (5.493)**	
Tar_R&D_10									**0.107*** (4.937)**
Tar_Size	-0.024***	-0.030***	-0.048***	-0.037***	-0.040***	-0.039***	-0.039***	-0.038***	-0.038***
	(-5.398)	(-6.827)	(-6.911)	(-8.667)	(-9.346)	(-9.241)	(-9.078)	(-8.954)	(-8.780)
Tar_MTB	0.005*	0.006**	0.007**	0.005*	0.005*	0.005**	0.006**	0.006**	0.006**
	(1.907)	(2.141)	(2.040)	(1.866)	(1.925)	(1.976)	(2.023)	(2.050)	(2.044)
Tar_Lev	-0.061*	-0.058	-0.019	-0.020	-0.010	-0.007	-0.010	-0.012	-0.021
	(-1.670)	(-1.570)	(-0.316)	(-0.542)	(-0.261)	(-0.194)	(-0.264)	(-0.324)	(-0.556)
Tar_ROE	0.008	0.001	0.024	0.011	-0.007	-0.007	-0.007	-0.004	-0.002
	(0.385)	(0.064)	(1.001)	(0.538)	(-0.364)	(-0.380)	(-0.363)	(-0.185)	(-0.080)
Tender	0.095***	0.098***	0.126***	0.091***	0.089***	0.090***	0.091***	0.096***	0.095***
	(4.731)	(4.882)	(4.658)	(4.616)	(4.440)	(4.496)	(4.543)	(4.824)	(4.789)
Competition	0.142***	0.146***	0.142***	0.147***	0.145***	0.144***	0.144***	0.147***	0.147***
	(4.342)	(4.426)	(2.976)	(4.492)	(4.428)	(4.422)	(4.406)	(4.474)	(4.457)
Toehold	-0.062**	-0.059**	-0.044	-0.057*	-0.054*	-0.054*	-0.055*	-0.056*	-0.054*
	(-2.080)	(-1.965)	(-1.040)	(-1.941)	(-1.843)	(-1.855)	(-1.882)	(-1.885)	(-1.825)
Hostile	0.002	0.000	-0.057*	-0.000	-0.008	-0.007	-0.003	-0.004	-0.003
	(0.065)	(0.015)	(-1.783)	(-0.019)	(-0.315)	(-0.267)	(-0.127)	(-0.155)	(-0.109)
Cash	0.040**	0.040**	0.015	0.035*	0.029	0.028	0.031*	0.031*	0.033*
	(2.252)	(2.222)	(0.514)	(1.946)	(1.633)	(1.555)	(1.722)	(1.729)	(1.850)
Stock	-0.009	-0.009	0.027	-0.005	-0.004	-0.005	-0.005	-0.006	-0.005
	(-0.553)	(-0.538)	(0.859)	(-0.298)	(-0.233)	(-0.317)	(-0.326)	(-0.369)	(-0.327)
Same_Ind	0.004	0.001	-0.002	-0.007	0.005	0.003	-0.003	-0.007	-0.008
	(0.247)	(0.078)	(-0.091)	(-0.484)	(0.382)	(0.224)	(-0.194)	(-0.464)	(-0.545)
Constant	0.331***	0.384***	0.487***	0.455***	0.433***	0.437***	0.449***	0.460***	0.461***
	(7.372)	(8.815)	(7.703)	(10.991)	(10.284)	(10.355)	(10.883)	(11.120)	(11.142)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	1,774	3,789	3,789	3,789	3,789	3,789	3,789
R-squared	0.111	0.105	0.108	0.107	0.108	0.108	0.106	0.106	0.105

This table presents the results of testing H1 when using alternative specifications of measuring the target's information asymmetry. The dependent variable is *Prem_4w* that is defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. *Tar_R&D_nonmiss* is as an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 5%, and zero otherwise (targets with missing data about R&D expenditures are excluded). *Tar_R&D_ratio* is the ratio of the target's R&D expenditures to total assets. *Tar_R&D_0, Tar_R&D_1, Tar_R&D_3, Tar_R&D_7, and Tar_R&D_10* are indicator variables that equal one if the target firm has a percentage of R&D to total assets that is higher than 0%, 1%, 3%, 7% and 10%, respectively, and zero otherwise. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.7.5 Additional control variables

To mitigate the endogeneity concerns arising from correlated omitted variables, this study conducts two further analyses that consider controlling for more variables. First, this study adds indicator variables for the target's industry fixed effects to main regression models to control for changes in the takeover activity across industries. This study uses Fama & French (1997) 12 industry classification. Table 3.13, Panel A, presents the results of testing all hypotheses after controlling for the target's industry fixed effects. The results are consistent with those in the main analysis.

Second, prior studies show that acquirer characteristics influence takeover outcomes such as the premium and abnormal announcement returns (e.g., Moeller et al., 2004; Eckbo, 2009). Therefore, this study re-estimates all regression models with controlling for acquirer characteristics including the following: (1) size, *Acq_Size*, is the natural logarithm of the acquirer's market capitalisation, (2) market to book ratio, *Acq_MTB*, is the ratio of the acquirer's market value of equity to its book value of equity, (3) leverage, *Acq_Lev*, is the ratio of the acquirer's long-term debt and short-term debt to total assets, and (4) return on equity, *Acq_ROE*, is the ratio of the acquirer's income before extraordinary items to its book value of equity. These four additional variables are measured at the end of the acquirer's latest fiscal year ended prior to the deal announcement date. In addition, prior studies find that termination fees (Bates & Lemmon, 2003; Jeon & Ligon, 2011; Neyland & Shekhar, 2018) and acquirer announcement returns (Luo, 2005) affect the likelihood of the deal termination. Thus, this study also controls for these two variables when examining the effect of the target's information asymmetry on the likelihood of the deal termination. The results are reported in Panel B of Table 3.13 and are consistent with the results in the main analysis. However, coefficients of *Tar_Vol* turn to be insignificant when examining the effect of the target's information asymmetry on combined announcement returns (column 4) and the likelihood of the downward renegotiation of the deal price (column 6).

Table 3.13
Additional control variables

Panel A: Controlling for target-firm industry fixed effects

Variables	*Prem_4w*	*Tar_Ret*	*Acq_Ret*	*Combined_Ret*	*Termination*	*Renegotiation*	*GW_Impairment*
	1	2	3	4	5	6	7
Tar_Vol	**0.213*** **	**0.079*** **	**-0.015** **	**-0.020*** **	**0.834*** **	**0.958***	**0.885*** **
	(6.943)	**(4.625)**	**(-2.468)**	**(-3.252)**	**(3.066)**	**(1.825)**	**(2.774)**
Tar_Size	-0.022***	-0.010***	-0.006***	-0.003***	-0.018	0.049	0.185***
	(-4.701)	(-3.803)	(-5.780)	(-3.311)	(-0.413)	(0.587)	(3.589)
Tar_MTB	0.003	-0.003*	-0.000	-0.001*	-0.001	-0.090**	-0.030
	(1.112)	(-1.912)	(-0.699)	(-1.795)	(-0.033)	(-2.111)	(-1.186)
Tar_Lev	-0.054	-0.025	0.012*	0.008	0.188	-0.105	-0.179
	(-1.414)	(-1.253)	(1.753)	(1.114)	(0.589)	(-0.179)	(-0.506)
Tar_ROE	0.005	0.001	-0.004	0.003	-0.082	0.141	-0.017
	(0.251)	(0.137)	(-1.104)	(0.787)	(-0.624)	(0.552)	(-0.107)
Tender	0.088***	0.083***	0.007**	0.011***	-2.167***	-1.089**	0.111
	(4.403)	(6.693)	(2.054)	(2.802)	(-7.626)	(-2.186)	(0.574)
Competition	0.142***	-0.055***	-0.000	-0.002	2.204***	-0.941	-0.614*
	(4.362)	(-4.436)	(-0.081)	(-0.400)	(13.994)	(-1.092)	(-1.670)
Toehold	-0.062**	-0.049***	0.001	-0.006	0.137	0.612	0.637
	(-2.113)	(-3.335)	(0.127)	(-0.854)	(0.511)	(1.094)	(1.463)
Hostile	-0.000	0.014	0.003	0.024***	4.214***	-0.796	-0.226
	(-0.020)	(1.197)	(0.620)	(4.535)	(18.473)	(-0.819)	(-0.346)
Cash	0.031*	0.058***	0.018***	0.006*	-0.094	-0.807**	-0.051
	(1.746)	(5.373)	(5.489)	(1.842)	(-0.555)	(-2.270)	(-0.276)
Stock	-0.009	-0.021**	-0.006	-0.011***	0.004	-0.093	0.155
	(-0.573)	(-2.364)	(-1.642)	(-3.228)	(0.024)	(-0.336)	(0.845)
Same_Ind	0.007	0.000	-0.000	0.003	-0.332***	0.015	-0.000
	(0.456)	(0.025)	(-0.090)	(0.941)	(-2.622)	(0.056)	(-0.003)
Constant	0.366***	0.208***	0.034***	0.050***	-1.832***	-0.775	-4.041***
	(6.175)	(5.996)	(2.641)	(3.541)	(-3.220)	(-0.446)	(-3.298)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
N	3,785	3,785	2,292	2,292	3,785	1,895	1,524
R-squared	0.121	0.147	0.100	0.103			
Pseudo R-squared					0.347	0.0900	0.120

Panel B: Controlling for acquirer characteristics and other variables

Variables	*Prem_4w*	*Tar_Ret*	*Acq_Ret*	*Combined_Ret*	*Termination*	*Renegotiation*	*GW_Impairment*
	1	2	3	4	5	6	7
Tar_Vol	**0.230*** **	**0.085*** **	**-0.015** **	**-0.008**	**1.070*** **	**0.723**	**1.174*** **
	(7.130)	**(4.156)**	**(-2.545)**	**(-1.513)**	**(2.934)**	**(1.105)**	**(4.017)**
Tar_Size	-0.051***	-0.034***	-0.008***	0.004***	0.406***	0.119	0.289***
	(-6.767)	(-7.660)	(-6.637)	(3.610)	(4.565)	(0.847)	(4.746)
Tar_MTB	-0.002	-0.002	-0.000	-0.001	0.004	-0.183***	-0.018
	(-0.422)	(-1.279)	(-0.604)	(-1.157)	(0.118)	(-2.881)	(-0.723)
Tar_Lev	0.051	0.026	0.006	0.002	-0.068	0.046	-0.259
	(0.965)	(0.863)	(0.815)	(0.235)	(-0.136)	(0.054)	(-0.720)
Tar_ROE	0.033	0.007	-0.006	0.002	-0.164	-0.295	0.059
	(1.555)	(0.570)	(-1.441)	(0.555)	(-0.853)	(-1.023)	(0.333)
Tender	0.097***	0.069***	0.008**	0.015***	-1.452***	-1.468*	0.224
	(4.196)	(4.583)	(2.313)	(4.080)	(-4.227)	(-1.786)	(1.115)
Competition	0.155***	-0.044***	0.003	-0.004	2.292***	-0.959	-0.791**
	(3.950)	(-2.772)	(0.564)	(-0.746)	(8.736)	(-0.831)	(-2.047)
Toehold	-0.031	-0.049*	-0.002	-0.005	-0.390	0.250	0.788*
	(-0.744)	(-1.923)	(-0.330)	(-0.734)	(-1.034)	(0.275)	(1.815)
Hostile	0.050*	0.047***	0.007	0.019***	3.914***	-	-0.090
	(1.668)	(3.063)	(1.317)	(3.773)	(11.752)		(-0.128)
Cash	0.012	0.044***	0.014***	0.014***	0.121	-1.050**	0.119
	(0.560)	(3.250)	(4.097)	(3.905)	(0.501)	(-1.983)	(0.645)
Stock	-0.007	-0.021*	-0.005	-0.011***	-0.014	-0.319	-0.112
	(-0.359)	(-1.948)	(-1.587)	(-3.366)	(-0.063)	(-0.933)	(-0.618)
Same_Ind	-0.002	-0.008	0.000	-0.001	-0.344*	0.212	-0.124
	(-0.138)	(-0.722)	(0.084)	(-0.489)	(-1.903)	(0.581)	(-0.819)
Acq_Size	0.036***	0.030***	0.002**	-0.010***	-0.425***	-0.002	-0.048
	(5.483)	(7.564)	(2.320)	(-10.577)	(-5.988)	(-0.022)	(-1.018)
Acq_MTB	0.005	0.000	-0.000	0.001	-0.038	0.041	0.008
	(1.422)	(0.162)	(-0.452)	(0.879)	(-0.917)	(0.775)	(0.301)
Acq_Lev	-0.116**	-0.037	0.026***	0.024**	0.739	-1.254	0.970**
	(-2.104)	(-1.153)	(2.664)	(2.506)	(1.331)	(-1.177)	(2.197)
Acq_ROE	-0.002	0.003	0.029***	0.023**	0.714*	0.397	-1.108***

	(-0.041)	(0.091)	(2.853)	(2.452)	(1.656)	(0.400)	(-3.398)
Termination_fee					-0.962***		
					(-4.446)		
Acq_Ret					-2.333*		
					(-1.682)		
Constant	0.182***	0.106***	0.009	0.066***	-1.353**	-3.140***	-5.543***
	(3.070)	(2.642)	(0.828)	(5.884)	(-1.976)	(-3.124)	(-4.857)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,210	2,210	2,204	2,204	2,204	1,191	1,512
R-squared	0.176	0.189	0.106	0.148			
Pseudo R-squared					0.410	0.121	0.109

This table presents the results of testing all hypotheses when using *Tar_Vol* to proxy for the target's information asymmetry and adding more control variables. Panel A presents the results with controlling for target-firm industry fixed effects. Fama & French (1997) 12 industry classification is used. Panel B reports the results with controlling for acquirer characteristics. *Acq_Size* is the natural logarithm of the acquirer's market capitalisation at the end of the fiscal year preceding the deal announcement date. *Acq_MTB* is the ratio of the acquirer's market value of equity to its book value of equity at the end of the fiscal year preceding the deal announcement date. *Acq_Lev* is the ratio of the acquirer's long-term debt and short-term debt to total assets at the end of the fiscal year preceding the deal announcement date. *Acq_ROE* is the ratio of the acquirer's income before extraordinary items to its book value of equity at the end of the fiscal year preceding the deal announcement date. *Termination fee* is an indicator variable that equals one if the deal includes termination fees offered by the target firm, and zero otherwise. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.7.6 Excluding target firms with negative equity values

In the main analysis, the sample includes 83 target firms with negative equity values at their latest fiscal years prior to M&A announcements. Although this study winsorise all continuous variables at the 1% and 99% to minimise the effect of outliers, this study re-examines all main regressions after excluding these deals to provide further assurance that the results are not driven by these firms that might be financially distressed. The results are shown in Table 3.14 when using *Tar_Vol* to proxy for the target's information asymmetry. The results are very similar to those reported in the main analysis.

Table 3.14
Retesting hypotheses after excluding target firms with negative equity values

Variables	*Prem_4w*	*Tar_Ret*	*Acq_Ret*	*Combined_Ret*	*Termination*	*Renegotiation*	*GW_Impairment*
	1	2	3	4	5	6	7
Tar_Vol	**0.220***** **(8.459)**	**0.082***** **(5.642)**	**-0.019***** **(-3.389)**	**-0.014***** **(-2.698)**	**0.729***** **(2.921)**	**1.193***** **(3.058)**	**1.352***** **(4.766)**
Tar_Size	-0.021***	-0.010***	-0.007***	-0.003***	0.014	-0.033	0.246***
	(-4.766)	(-3.875)	(-6.811)	(-3.198)	(0.321)	(-0.427)	(4.855)
Tar_MTB	0.005*	-0.002	-0.000	-0.001	0.001	-0.080*	-0.036
	(1.808)	(-1.487)	(-0.095)	(-1.447)	(0.029)	(-1.864)	(-1.287)
Tar_Lev	-0.094**	-0.040**	0.011	0.012	0.215	-0.084	0.407
	(-2.550)	(-2.080)	(1.554)	(1.616)	(0.668)	(-0.141)	(1.103)
Tar_ROE	-0.005	-0.003	-0.003	0.006	-0.218*	0.418	0.016
	(-0.221)	(-0.289)	(-0.618)	(1.201)	(-1.678)	(1.180)	(0.082)
Tender	0.083***	0.080***	0.009**	0.014***	-2.240***	-0.999**	0.277
	(4.273)	(6.569)	(2.576)	(3.670)	(-7.746)	(-2.256)	(1.381)
Competition	0.148***	-0.054***	0.001	0.000	2.189***	-0.664	-0.586
	(4.453)	(-4.395)	(0.217)	(0.051)	(13.943)	(-0.878)	(-1.626)
Toehold	-0.062**	-0.049***	-0.000	-0.006	0.193	1.075**	0.601
	(-2.056)	(-3.310)	(-0.070)	(-0.861)	(0.708)	(2.126)	(1.446)
Hostile	0.004	0.017	0.005	0.026***	4.225***	0.802	-0.286
	(0.175)	(1.476)	(1.086)	(4.816)	(18.281)	(0.953)	(-0.419)
Cash	0.031*	0.058***	0.019***	0.008**	-0.060	-0.734**	-0.020
	(1.749)	(5.474)	(5.707)	(2.224)	(-0.349)	(-2.072)	(-0.111)
Stock	-0.017	-0.025***	-0.005	-0.011***	-0.061	0.244	-0.051
	(-1.024)	(-2.901)	(-1.395)	(-3.324)	(-0.397)	(0.933)	(-0.288)
Same_Ind	0.004	-0.003	-0.001	0.000	-0.380***	-0.009	-0.079
	(0.312)	(-0.411)	(-0.465)	(0.056)	(-3.056)	(-0.037)	(-0.526)
Constant	0.335***	0.188***	0.021**	0.038***	-2.036***	-3.355***	-5.654***
	(7.807)	(7.714)	(2.104)	(3.510)	(-4.379)	(-5.825)	(-4.883)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,706	3,706	2,237	2,237	3,706	2,351	1,485
R-squared	0.122	0.141	0.091	0.090			
Pseudo R-squared					0.3447	0.0533	0.0939

This table presents the results of testing all hypotheses when using *Tar_Vol* to proxy for the target's information asymmetry and excluding target firms with negative equity values. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.8 Alternative explanation: The target's discounted value

This study interprets the positive effect of the target's information asymmetry on the takeover premium and target announcement returns in accordance with the bidder's overpayment explanation. That is, bidders insufficiently discount their bids in response to the uncertainty about the target's value arising from the target's information asymmetry. This overpayment could be rooted by the winner's curse and/or principal-agent conflicts on the side of the bidder's managers. However, an alternative explanation for the positive effect of the target's information asymmetry on the takeover premium and target announcement returns could be the discounted values of target firms with high levels of information asymmetry. That is, if the value of the target firm is discounted

because of high information asymmetry, it is expected that bidders will offer large positive premiums as they depend on the intrinsic value rather than the depressed market price. In addition, receiving large premiums and the correction of the target's depressed market price would be positively perceived by target shareholders upon the announcement of the acquisition.

In attempting to disentangle between these two explanations, this study first examines the effect of the target's information asymmetry on both bidder announcement returns as well as combined announcement returns of portfolios of bidders and targets. Although the predictions of the bidder's overpayment and the target's discounted value explanations regarding the effects of the target's information asymmetry on the takeover premium and target announcement returns are similar, their predictions regarding the effects on bidder announcement returns and combined announcement returns would be different. According to the overpayment explanation, if the target's information asymmetry makes bidders less effective to bid and accurately estimate the true value of the target, large premiums might indicate the bidder's overpayment that would be negatively perceived by shareholders of the bidding firm. Combined returns of both the target and the acquirer are also expected to be lower. Therefore, bidder announcement returns, as well as combined announcement returns for both the target and the acquirer are expected to decrease when the target's information asymmetry increases. Consistent with this, McNichols and Stubben (2015) find that uncertainty about the target's value leads to decreasing acquirer returns around the acquisition announcement date. They also find that acquirers gain higher returns around acquisition announcements when targets have a higher quality of accounting, suggesting that the target's high accounting quality helps acquirers to accurately value target firms.

On the other hand, according to the target's discounted value explanation, if bidder shareholders agree with the valuation by the bidder's managers of the target firm and realise the benefits of the discounting value of the target, bidder announcement returns are expected to be higher when the target's information asymmetry is high. Consistent with this, Cheng et al. (2016) interpret the positive effect of the target's information asymmetry on bidder announcement returns as the market realizes and agrees with the valuation by the bidder's managers of the target firm. That is, the bidder's managers would have more information than the market about the target firm. In addition, they find a positive impact of the target's information asymmetry on combined announcement returns.

In favour of the bidder's overpayment explanation, this study finds that the three proxies of the target's information asymmetry are negatively and significantly associated with bidder announcement returns. This suggests that large premiums offered by bidders to target firms with high information asymmetry might indicate the bidder's overpayment that would be negatively perceived by shareholders of the bidding firm. In addition, this study finds a negative association between the target's information asymmetry and combined announcement returns.

Second, this study argues that the predictions of the two explanations regarding the effect of the target's information asymmetry on the likelihood of the deal termination and the likelihood of the downward renegotiation of the deal price would also differ. This study predicts that if the likelihood of the deal termination (or the downward renegotiation of the deal price) is higher when target firms have high ex ante information asymmetry, this might indicate the bidder's initial overbidding. That is, by getting access to more private information during the transactional due diligence stage and discovering material adverse risks, bidders who initially overestimated target firms with high information asymmetry might decide to terminate the deal or, at least, downward renegotiate the deal price.

However, according to the target's discounted value explanation, the takeover market corrects the market's undervaluation of target firms with high information asymmetry (Cheng et al., 2016). As the target's information asymmetry increases the takeover premium, this suggests that target firms will be more willing to complete deals to receive the large premiums and correct their discounted values. At the same time, the bidder's managers are expected to know the true value of the target firm better than the market and that the takeover of such a target will be an opportunity for a bargain (Cheng et al., 2016). Thus, if the target's information asymmetry reflects the discounted value of the target firm, it is also expected that the bidder will be more willing to complete the deal to not lose this opportunity. It is also less likely that bidders downward renegotiate the deal price if they perceive the discounted value of the target firm. Accordingly, this study argues that if there is a negative association between the target's information asymmetry and the likelihood of the deal termination (as well as the likelihood of the downward renegotiation of the deal price), this might lend support for the target's discounted value explanation.

This study finds that the likelihood of the deal termination is higher when target firms have high ex ante information asymmetry. In addition, given that the deal is

completed, the likelihood of the downward renegotiation of the deal price increases when the target's information asymmetry increases. Thus, the findings of this study are more consistent with the bidder's overpayment explanation.

Third, this study argues that if the target's ex ante information asymmetry increases the divergence between bidders and the possibility that bidders overbid, the likelihood that the winning bidder to subsequently report goodwill impairments would be higher. Consistent with this argument, this study finds that the likelihood that the acquirer subsequently reports goodwill impairment increases when the target's information asymmetry increases. This finding suggests that the target's information asymmetry increases the difficulty of accurately estimating the intrinsic value of the target firm, which increases the likelihood that bidders overestimate the values of target firms and, consequently, increases the likelihood of the acquirer's subsequent reporting of goodwill impairment. This evidence also provides support to the bidder's overpayment explanation.

Last, the target's discounted value explanation entails that firms with higher levels of information asymmetry are priced at higher discounts and, therefore, they receive greater premiums in M&A transactions. If this is the case, this study argues that the association between the target's information asymmetry and the takeover premium would cross-sectionally differ based on the pre-acquisition valuations of target firms. In particular, the association between the target's information asymmetry and the takeover premium would be more pronounced for target firms that have lower pre-acquisition valuations. To test this, this study cross-sectionally examines the association between the target's information asymmetry and the takeover premium based on the target's pre-acquisition valuation.

Specifically, this study divides the entire sample into two subsamples based on the target's pre-acquisition Tobin's Q ratio and market to book (MTB) ratio and then re-examines the association separately for each subsample. The target firm is classified as with low (high) pre-acquisition valuation if the target's Tobin's Q ratio or MTB ratio is lower (equals or greater than) their sample medians. Tobin's Q is calculated as the total of the target's market value of equity and liabilities relative to its total assets. MTB is the ratio of the target's market value of equity to its book value of equity. Both Tobin's Q and MTB are calculated at the end of the target's fiscal year preceding the deal announcement date. Table 3.15, Panel A, presents the results when splitting the sample based on Tobin's Q. The results show that the association between the target's

information asymmetry and the takeover premium is positive and statistically significant in both subsamples of target firms with low and high pre-acquisition valuations. Similar results are obtained when splitting the sample based on MTB ratio, as reported in Panel B of Table 3.15. This suggests that the results of this study regarding the effect of the target's information asymmetry on the takeover premium are not likely to be driven by the target's discounted value.[25]

Table 3.15
Cross-sectional differences in the association between target's information asymmetry and takeover premium

Panel A: Analyses of subsamples based on the target's Tobin's Q ratio

Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*
	1	2	3	4	5	6
Tar_Vol	**0.242*** **	**0.271*** **				
	(5.328)	**(6.869)**				
Tar_BidAsk			**0.163*** **	**0.238*** **		
			(4.059)	**(6.249)**		
Tar_R&D					**0.094** **	**0.101*** **
					(2.058)	**(4.911)**
Tar_Size	-0.029***	-0.008	-0.039***	-0.013*	-0.049***	-0.028***
	(-4.307)	(-1.212)	(-6.112)	(-1.903)	(-7.573)	(-4.568)
Tar_MTB	-0.001	0.002	-0.001	0.003	-0.006	0.004
	(-0.087)	(0.860)	(-0.055)	(0.899)	(-0.327)	(1.339)
Tar_Lev	-0.084	-0.025	-0.073	-0.020	-0.027	0.026
	(-1.571)	(-0.484)	(-1.357)	(-0.395)	(-0.512)	(0.489)
Tar_ROE	0.088**	-0.033	0.079*	-0.035*	0.065	-0.035*
	(2.102)	(-1.572)	(1.869)	(-1.681)	(1.495)	(-1.725)
Tender	0.058*	0.115***	0.062*	0.119***	0.065**	0.118***
	(1.790)	(4.541)	(1.895)	(4.637)	(1.993)	(4.589)
Competition	0.124***	0.153***	0.130***	0.161***	0.137***	0.145***
	(2.712)	(3.561)	(2.775)	(3.721)	(2.933)	(3.411)
Toehold	-0.049	-0.068	-0.047	-0.069	-0.043	-0.061
	(-1.172)	(-1.555)	(-1.110)	(-1.555)	(-1.026)	(-1.386)
Hostile	0.017	-0.022	0.019	-0.024	0.018	-0.036
	(0.534)	(-0.630)	(0.585)	(-0.683)	(0.554)	(-1.034)
Cash	0.011	0.050**	0.010	0.050**	0.009	0.043*
	(0.433)	(2.101)	(0.371)	(2.070)	(0.336)	(1.766)
Stock	-0.025	0.015	-0.026	0.013	-0.023	0.025
	(-1.112)	(0.623)	(-1.175)	(0.544)	(-1.013)	(1.055)
Same_Ind	-0.015	0.015	-0.019	0.013	-0.028	0.009
	(-0.626)	(0.849)	(-0.813)	(0.715)	(-1.185)	(0.508)
Constant	0.420***	0.210***	0.510***	0.252***	0.582***	0.368***
	(6.351)	(3.364)	(8.216)	(4.119)	(9.338)	(6.750)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,895	1,894	1,895	1,894	1,895	1,894
R-squared	0.137	0.132	0.128	0.128	0.122	0.123

[25] The results are robust to dividing the sample of target firms into three quantiles based on their Tobin's Q and MTB ratios. That is, the target is classified as with low (high) pre-acquisition valuation when the target firm is in the lowest (highest) quantile of the sample. The results are reported in Table A.3.3 in the appendix of this chapter.

Table 3.15 (continued)

Panel B: Analyses of subsamples based on the target's MTB ratio

Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*
	1	2	3	4	5	6
Tar_Vol	**0.203*** **	**0.239*** **				
	(5.419)	**(6.085)**				
Tar_BidAsk			**0.122*** **	**0.215*** **		
			(3.542)	**(6.165)**		
Tar_R&D					**0.080*** **	**0.094*** **
					(2.725)	**(4.014)**
Tar_Size	-0.029***	-0.009	-0.039***	-0.014**	-0.047***	-0.027***
	(-4.174)	(-1.439)	(-5.786)	(-2.274)	(-7.409)	(-4.428)
Tar_MTB	-0.012	0.003	-0.014	0.003	-0.016	0.005
	(-1.101)	(1.072)	(-1.358)	(1.050)	(-1.565)	(1.495)
Tar_Lev	-0.071	-0.078	-0.061	-0.078	-0.028	-0.039
	(-1.258)	(-1.546)	(-1.071)	(-1.529)	(-0.482)	(-0.740)
Tar_ROE	0.059**	-0.044*	0.052*	-0.045*	0.047	-0.051**
	(2.024)	(-1.808)	(1.784)	(-1.890)	(1.602)	(-2.111)
Tender	0.061**	0.107***	0.066**	0.107***	0.065**	0.111***
	(2.055)	(4.062)	(2.219)	(4.051)	(2.173)	(4.127)
Competition	0.096**	0.209***	0.100***	0.217***	0.106***	0.205***
	(2.512)	(3.832)	(2.590)	(3.963)	(2.774)	(3.777)
Toehold	-0.056	-0.062	-0.054	-0.065	-0.051	-0.052
	(-1.469)	(-1.309)	(-1.397)	(-1.348)	(-1.359)	(-1.083)
Hostile	0.022	-0.042	0.021	-0.042	0.018	-0.049
	(0.715)	(-1.069)	(0.699)	(-1.051)	(0.590)	(-1.230)
Cash	0.042*	0.032	0.041*	0.032	0.040	0.026
	(1.669)	(1.282)	(1.652)	(1.269)	(1.563)	(1.006)
Stock	-0.010	-0.011	-0.009	-0.015	-0.007	-0.011
	(-0.420)	(-0.450)	(-0.394)	(-0.616)	(-0.297)	(-0.439)
Same_Ind	-0.003	0.012	-0.007	0.010	-0.011	0.001
	(-0.120)	(0.633)	(-0.317)	(0.546)	(-0.516)	(0.052)
Constant	0.403***	0.241***	0.484***	0.286***	0.542***	0.387***
	(6.597)	(3.355)	(8.181)	(4.142)	(9.435)	(5.959)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,895	1,894	1,895	1,894	1,895	1,894
R-squared	0.124	0.137	0.116	0.135	0.114	0.128

This table presents the results of examining the relation between the target's information asymmetry and the takeover premium for subsamples of target firms with high versus low pre-acquisition valuations. The dependent variable is *Prem_4w* and is defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. The target firm is classified as with low (high) pre-acquisition valuation if the target's Tobin's Q ratio or MTB ratio is lower (equals or greater than) their sample medians. Tobin's Q is calculated as the ratio of the total of the target's market value of equity and liabilities to its total assets. MTB is the ratio of the target's market value of equity to its book value of equity. Both Tobin's Q and MTB are calculated at the end of the target's fiscal year preceding the deal announcement date. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors that are doubled (two-way) clustered by both year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

3.9 Summary

M&A transactions represent one of the most influential events that firms might experience. A huge body of research in different disciplines, including strategic management, law, economics, finance, and accounting, has extensively researched the motives of such influential events. However, the wide evidence shows that M&A transactions are, on average, value-decreasing or value-neutral to shareholders of acquiring firms. A growing research stream addresses whether uncertainty about the value of the target firm arising from information asymmetry could explain a part of the shareholder wealth effect of these transactions. However, the evidence of this research is inconsistent. This study firstly disentangles the mixed evidence regarding the effect of the target's information asymmetry on shareholders' wealth of the acquiring firm by using several measures of the target's information asymmetry that capture the informational advantage of the target's managers over the market and by using a large sample of 3,789 M&A deals between U.S. publicly traded firms announced over the period 1986-2017. Additionally, this study explores the impact of a target's information asymmetry on the likelihood of terminating and renegotiating M&A deals. Further, this study investigates whether the target's information asymmetry affects the acquirer's long-term performance.

This study finds that the target's ex ante information asymmetry is positively associated with the takeover premium, suggesting that takeover premiums offered by bidders are higher when target firms have high levels of information asymmetry. To explain how the market perceives these large premiums, this study examines the market reaction around the announcement of M&A transactions for the target, the bidder, and the portfolio of the target and the bidder. The results show that while the target's information asymmetry positively associates with target announcement returns, it negatively associates with bidder announcement returns as well as combined announcement returns. These results indicate that large premiums in M&A transactions involving target firms with high information asymmetry are negatively perceived by bidder shareholders. That is, the target's information asymmetry might increase the difficulty of estimating the true value of the target firm and, therefore, the risk that the bidder overestimates the true value of the target firm. This evidence suggests that M&A transactions involving target firms with high information asymmetry entail a shareholder wealth transfer from the bidder to the target.

This study also documents that a target's information asymmetry affects the ultimate outcome of M&A transactions. Deals involving target firms with high

information asymmetry are more likely to be terminated. In addition, given that deals are completed, deals' initial prices are more likely to be downward renegotiated when target firms have high information asymmetry. These findings suggest that some bidders attempt to rationally behave in response to the target's uncertainty arising from high information asymmetry by completely withdrawing their deals or continuing in deals after downward renegotiating their initial offer prices. Although this evidence might support the rational behaviour of some bidders, this does not mean that all bidders rationally or sufficiently consider the risk of the target's high information asymmetry. As noted by Black (1988), if some bidders rationally behave in valuing target firms, others do not. Moreover, the winning acquirer is typically the one who most excessively overestimates the value of the target firm. Consistent with these arguments, this study finds that the target's information asymmetry increases the likelihood of the acquirer's post-acquisition reporting of goodwill impairment losses. This result suggests that the long-term impact of the target's information asymmetry on the acquirer's performance is consistent with the negative short-term market response to M&A announcements involving target firms with high information asymmetry.

Overall, this study shows that the target's information asymmetry affects the investment decisions of bidding firms. This study also contends that the target's information asymmetry decreases the profitability of M&A transactions to acquiring firms in the short- as well as long-terms. This study finds that acquirers in completed deals involving target firms with high information asymmetry are more likely to subsequently report goodwill impairment losses. Thus, the findings of this study are more consistent with the bidder's overpayment explanation.

There are important implications for the findings of this study. The findings suggest that shareholders of the acquiring firms should pay close attention to information uncertainty of the investment opportunities and, therefore, how this uncertainty might decrease the quality of the acquisition investment decisions made by managers. The findings also show that managers of the acquiring firms should consider discounting the values of target firms that have high levels of information asymmetry. Furthermore, this study advises managers to consider learning from the market by paying more attention to deals that are negatively perceived by the market, consistent with the evidence in Luo (2005). That is, the findings show that when the market negatively reacts to the announcement of M&As involving target firms with high information asymmetry, acquirers also post-acquisition underperform.

Appendix to Chapter 3

Table A.3.1

OLS regressions of takeover premium using alternative measures of takeover premium and *Tar_BidAsk* and *Tar_R&D* to proxy for target's information asymmetry

Variables	*Prem42d*		*Prem64d*		*Prem85d*		*Prem105d*	
	1	2	3	4	5	6	7	8
Tar_BidAsk	**0.160*** **		**0.173*** **		**0.143*** **		**0.117*** **	
	(5.276)		**(5.252)**		**(4.127)**		**(2.955)**	
Tar_R&D		**0.098*** **		**0.110*** **		**0.100*** **		**0.096*** **
		(4.502)		**(4.438)**		**(3.906)**		**(3.432)**
Tar_Size	-0.019***	-0.028***	-0.021***	-0.031***	-0.023***	-0.031***	-0.028***	-0.034***
	(-3.036)	(-4.742)	(-3.159)	(-4.805)	(-3.285)	(-4.613)	(-3.544)	(-4.482)
Tar_MTB	0.005	0.005	0.006	0.006	0.006	0.006	0.012**	0.011**
	(1.237)	(1.296)	(1.392)	(1.422)	(1.379)	(1.356)	(2.142)	(2.034)
Tar_Lev	-0.132***	-0.082*	-0.099**	-0.043	-0.125**	-0.074	-0.134**	-0.085
	(-3.012)	(-1.799)	(-1.969)	(-0.828)	(-2.517)	(-1.457)	(-2.376)	(-1.476)
Tar_ROE	-0.017	-0.019	-0.007	-0.009	0.013	0.013	0.028	0.031
	(-0.688)	(-0.774)	(-0.267)	(-0.322)	(0.488)	(0.495)	(0.894)	(0.985)
Tender	0.045*	0.045*	0.039	0.039	0.044	0.043	0.033	0.031
	(1.793)	(1.825)	(1.427)	(1.439)	(1.557)	(1.532)	(1.030)	(0.966)
Competition	0.022	0.020	0.033	0.031	0.066	0.064	0.055	0.054
	(0.630)	(0.586)	(0.858)	(0.815)	(1.573)	(1.544)	(1.215)	(1.189)
Toehold	-0.034	-0.028	-0.013	-0.007	-0.009	-0.004	-0.001	0.003
	(-0.735)	(-0.611)	(-0.248)	(-0.128)	(-0.157)	(-0.073)	(-0.012)	(0.045)
Hostile	0.145***	0.140***	0.135***	0.130***	0.103**	0.099**	0.134***	0.130**
	(3.496)	(3.388)	(3.033)	(2.913)	(2.252)	(2.157)	(2.630)	(2.557)
Cash	0.016	0.011	0.035	0.029	0.019	0.014	0.009	0.003
	(0.682)	(0.476)	(1.396)	(1.167)	(0.748)	(0.531)	(0.304)	(0.104)
Stock	-0.023	-0.020	-0.032	-0.028	-0.037	-0.035	-0.050*	-0.049*
	(-1.052)	(-0.891)	(-1.332)	(-1.178)	(-1.535)	(-1.430)	(-1.856)	(-1.806)
Same_Ind	-0.012	-0.019	-0.001	-0.008	0.004	-0.002	0.005	-0.000
	(-0.620)	(-1.004)	(-0.037)	(-0.421)	(0.208)	(-0.101)	(0.199)	(-0.020)
Constant	0.634***	0.700***	0.613***	0.684***	0.626***	0.684***	0.713***	0.758***
	(5.984)	(6.720)	(5.277)	(5.981)	(5.471)	(6.075)	(5.042)	(5.430)
N	3,789	3,789	3,789	3,789	3,788	3,788	3,788	3,788
R-squared	0.067	0.066	0.064	0.064	0.065	0.066	0.062	0.063
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the results of using alternative measures of the takeover premium when testing H1 and using the target's bid-ask spread and R&D intensity to proxy for information asymmetry. *Prem42d, Prem64d, Prem85d, or Prem105d* are defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price on the trading day -42, -64, -85, or -105 prior to the deal announcement date (day 0), minus one. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Table A.3.2
Alternative specifications of measuring information asymmetry

Panel A: OLS regressions of target announcement returns

Variables	*Dep. Var. = Tar_Ret*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**0.961*** **								
	(3.291)								
Tar_BidAsk		**0.291**							
		(1.462)							
Tar_R&D_nonmiss			**0.046*** **						
			(3.624)						
Tar_R&D_ratio				**0.240*** **					
				(4.183)					
Tar_R&D_0					**0.061*** **				
					(7.426)				
Tar_R&D_1						**0.060*** **			
						(6.899)			
Tar_R&D_3							**0.054*** **		
							(5.849)		
Tar_R&D_7								**0.057*** **	
								(5.533)	
Tar_R&D_10									**0.060*** **
									(5.085)
Tar_Size	-0.012***	-0.015***	-0.022***	-0.015***	-0.017***	-0.017***	-0.016***	-0.016***	-0.016***
	(-5.014)	(-6.444)	(-5.688)	(-6.911)	(-7.626)	(-7.494)	(-7.287)	(-7.154)	(-7.007)
Tar_MTB	-0.002	-0.001	-0.002	-0.002	-0.003*	-0.002*	-0.002*	-0.002	-0.002
	(-1.138)	(-0.778)	(-1.169)	(-1.588)	(-1.882)	(-1.809)	(-1.661)	(-1.594)	(-1.461)
Tar_Lev	-0.027	-0.026	-0.000	-0.006	0.005	0.006	0.003	0.001	-0.004
	(-1.411)	(-1.367)	(-0.006)	(-0.287)	(0.275)	(0.329)	(0.150)	(0.047)	(-0.223)
Tar_ROE	0.000	-0.004	0.009	0.009	0.001	0.001	0.000	0.002	0.003
	(0.033)	(-0.460)	(0.727)	(0.912)	(0.091)	(0.058)	(0.022)	(0.210)	(0.318)
Tender	0.088***	0.090***	0.085***	0.084***	0.081***	0.082***	0.083***	0.086***	0.086***
	(7.161)	(7.287)	(5.044)	(6.905)	(6.682)	(6.739)	(6.826)	(7.061)	(7.026)
Competition	-0.053***	-0.051***	-0.065***	-0.051***	-0.052***	-0.053***	-0.053***	-0.051***	-0.051***
	(-4.292)	(-4.193)	(-3.642)	(-4.237)	(-4.314)	(-4.349)	(-4.340)	(-4.178)	(-4.144)
Toehold	-0.052***	-0.051***	-0.058**	-0.050***	-0.049***	-0.049***	-0.049***	-0.050***	-0.049***
	(-3.452)	(-3.389)	(-2.254)	(-3.329)	(-3.309)	(-3.319)	(-3.337)	(-3.329)	(-3.273)
Hostile	0.015	0.015	0.016	0.015	0.011	0.012	0.014	0.013	0.014
	(1.299)	(1.227)	(0.906)	(1.301)	(0.930)	(0.998)	(1.185)	(1.141)	(1.197)
Cash	0.061***	0.061***	0.056***	0.058***	0.054***	0.053***	0.056***	0.056***	0.057***
	(5.668)	(5.653)	(3.295)	(5.380)	(4.980)	(4.906)	(5.112)	(5.124)	(5.254)
Stock	-0.022**	-0.021**	-0.028*	-0.021**	-0.021**	-0.022**	-0.022**	-0.022***	-0.022**
	(-2.518)	(-2.391)	(-1.764)	(-2.485)	(-2.469)	(-2.564)	(-2.545)	(-2.581)	(-2.534)
Same_Ind	-0.004	-0.005	-0.006	-0.007	0.000	-0.001	-0.005	-0.007	-0.008
	(-0.499)	(-0.688)	(-0.503)	(-0.954)	(0.011)	(-0.179)	(-0.661)	(-0.945)	(-1.027)
Constant	0.197***	0.223***	0.259***	0.230***	0.215***	0.217***	0.226***	0.232***	0.233***
	(7.760)	(9.125)	(6.894)	(10.023)	(9.164)	(9.249)	(9.831)	(10.092)	(10.134)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	1,774	3,789	3,789	3,789	3,789	3,789	3,789
R-squared	0.138	0.135	0.146	0.143	0.148	0.146	0.143	0.143	0.142

Panel B: OLS regressions of acquirer announcement returns

Variables	*Dep. Var. = Acq_Ret*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**-0.188***								
	(-1.789)								
Tar_BidAsk		**-0.168** **							
		(-2.353)							
Tar_R&D_nonmiss			**-0.012*** **						
			(-2.592)						
Tar_R&D_ratio				**-0.031** **					
				(-2.059)					
Tar_R&D_0					**-0.005**				
					(-1.636)				
Tar_R&D_1						**-0.007** **			
						(-2.332)			
Tar_R&D_3							**-0.010*** **		
							(-3.123)		
Tar_R&D_7								**-0.011*** **	
								(-3.149)	
Tar_R&D_10									**-0.012*** **
									(-3.120)
Tar_Size	-0.006***	-0.006***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
	(-5.943)	(-6.175)	(-3.364)	(-5.862)	(-5.526)	(-5.551)	(-5.664)	(-5.798)	(-5.891)
Tar_MTB	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	-0.000	-0.000	-0.000
	(-0.988)	(-0.922)	(-0.649)	(-0.934)	(-1.007)	(-0.893)	(-0.728)	(-0.724)	(-0.749)
Tar_Lev	0.014**	0.014**	0.010	0.012*	0.012*	0.010	0.008	0.008	0.010
	(2.101)	(2.070)	(0.929)	(1.660)	(1.649)	(1.438)	(1.177)	(1.182)	(1.363)
Tar_ROE	-0.003	-0.004	-0.005	-0.004	-0.002	-0.003	-0.003	-0.004	-0.004
	(-0.848)	(-0.964)	(-1.003)	(-0.989)	(-0.619)	(-0.721)	(-0.876)	(-0.946)	(-0.996)
Tender	0.008**	0.008**	0.005	0.008**	0.008**	0.008**	0.009**	0.008**	0.008**

	(2.187)	(2.218)	(1.112)	(2.312)	(2.245)	(2.331)	(2.465)	(2.294)	(2.357)
Competition	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000
	(0.134)	(0.091)	(0.002)	(0.068)	(0.115)	(0.139)	(0.165)	(0.116)	(0.094)
Toehold	-0.000	-0.001	-0.012	0.000	-0.001	-0.000	0.000	0.000	0.000
	(-0.066)	(-0.092)	(-1.307)	(0.024)	(-0.088)	(-0.066)	(0.044)	(0.054)	(0.000)
Hostile	0.004	0.004	0.007	0.004	0.005	0.005	0.005	0.004	0.004
	(0.866)	(0.843)	(1.058)	(0.874)	(0.991)	(0.987)	(0.960)	(0.885)	(0.901)
Cash	0.018***	0.018***	0.016***	0.018***	0.019***	0.019***	0.019***	0.019***	0.019***
	(5.569)	(5.598)	(3.025)	(5.668)	(5.661)	(5.801)	(5.866)	(5.876)	(5.819)
Stock	-0.006*	-0.006*	-0.015**	-0.006*	-0.007*	-0.006*	-0.006*	-0.006*	-0.006*
	(-1.878)	(-1.824)	(-2.515)	(-1.894)	(-1.956)	(-1.909)	(-1.880)	(-1.821)	(-1.860)
Same_Ind	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-0.414)	(-0.453)	(-0.581)	(-0.232)	(-0.482)	(-0.524)	(-0.421)	(-0.254)	(-0.186)
Constant	0.016	0.016	0.023*	0.009	0.010	0.010	0.010	0.009	0.008
	(1.538)	(1.584)	(1.782)	(0.894)	(0.982)	(0.998)	(1.033)	(0.889)	(0.862)
Year FE	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
N	2,292	2,292	1,130	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.088	0.089	0.111	0.088	0.087	0.089	0.091	0.091	0.091

Panel C: OLS regressions of combined announcement returns

Variables	*Dep. Var. = Combined_Ret*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**-0.226****								
	(-2.164)								
Tar_BidAsk		**-0.181****							
		(-2.525)							
Tar_R&D_nonmiss			**-0.006**						
			(-1.375)						
Tar_R&D_ratio				**-0.041*****					
				(-2.777)					
Tar_R&D_0					**-0.003**				
					(-0.841)				
Tar_R&D_1						**-0.005***			
						(-1.676)			
Tar_R&D_3							**-0.008****		
							(-2.351)		
Tar_R&D_7								**-0.009****	
								(-2.423)	
Tar_R&D_10									**-0.012*****
									(-3.358)
Tar_Size	-0.002***	-0.002***	-0.002**	-0.002**	-0.001*	-0.001*	-0.001*	-0.002*	-0.002**
	(-2.743)	(-2.741)	(-1.969)	(-2.095)	(-1.749)	(-1.741)	(-1.817)	(-1.919)	(-2.060)
Tar_MTB	-0.001*	-0.001*	-0.001*	-0.001*	-0.001**	-0.001*	-0.001*	-0.001*	-0.001
	(-1.793)	(-1.762)	(-1.805)	(-1.677)	(-2.079)	(-1.923)	(-1.768)	(-1.751)	(-1.604)
Tar_Lev	0.012*	0.012*	0.004	0.008	0.010	0.009	0.007	0.007	0.007
	(1.696)	(1.660)	(0.399)	(1.143)	(1.434)	(1.212)	(0.997)	(0.994)	(0.962)
Tar_ROE	0.004	0.003	0.005	0.002	0.005	0.005	0.004	0.004	0.003
	(0.922)	(0.858)	(1.030)	(0.570)	(1.334)	(1.217)	(1.083)	(1.017)	(0.823)
Tender	0.012***	0.012***	0.011**	0.013***	0.012***	0.012***	0.013***	0.012***	0.013***
	(3.229)	(3.237)	(2.224)	(3.424)	(3.163)	(3.270)	(3.380)	(3.256)	(3.380)
Competition	-0.000	-0.001	0.001	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001
	(-0.096)	(-0.148)	(0.127)	(-0.178)	(-0.136)	(-0.114)	(-0.092)	(-0.129)	(-0.144)
Toehold	-0.006	-0.007	-0.021**	-0.006	-0.007	-0.006	-0.006	-0.006	-0.006
	(-0.888)	(-0.914)	(-2.438)	(-0.772)	(-0.917)	(-0.898)	(-0.818)	(-0.812)	(-0.832)
Hostile	0.026***	0.026***	0.035***	0.026***	0.027***	0.027***	0.026***	0.026***	0.026***
	(4.845)	(4.820)	(4.738)	(4.848)	(4.910)	(4.920)	(4.886)	(4.864)	(4.888)
Cash	0.007**	0.007**	-0.001	0.007**	0.007**	0.008**	0.008**	0.008**	0.008**
	(2.010)	(2.031)	(-0.239)	(2.130)	(2.018)	(2.148)	(2.200)	(2.223)	(2.264)
Stock	-0.013***	-0.013***	-0.019***	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***
	(-3.870)	(-3.832)	(-3.241)	(-3.874)	(-3.960)	(-3.923)	(-3.904)	(-3.865)	(-3.867)
Same_Ind	0.001	0.000	-0.000	0.001	0.001	0.001	0.001	0.001	0.001
	(0.183)	(0.167)	(-0.024)	(0.402)	(0.282)	(0.201)	(0.268)	(0.396)	(0.455)
Constant	0.039***	0.038***	0.053***	0.031***	0.031***	0.031***	0.031***	0.030***	0.030***
	(3.549)	(3.557)	(3.143)	(2.934)	(2.939)	(2.975)	(3.001)	(2.920)	(2.899)
Year FE	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
N	2,292	2,292	1,130	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.089	0.089	0.120	0.090	0.086	0.087	0.089	0.089	0.091

Panel D: Logistic regressions of the likelihood of deal termination

Variables	*Dep. Var. = Terminated*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**12.480*****								
	(3.466)								
Tar_BidAsk		**4.638***							
		(1.822)							
Tar_R&D_nonmiss			**-0.493*****						
			(-2.658)						
Tar_R&D_ratio				**-1.049**					
				(-1.401)					
Tar_R&D_0					**0.033**				
					(0.249)				
Tar_R&D_1						**0.008**			

						(0.057)			
Tar_R&D_3							**-0.082**		
							(-0.565)		
Tar_R&D_7								**-0.308***	
								(-1.884)	
Tar_R&D_10									**-0.151**
									(-0.857)
Tar_Size	-0.013	-0.048	-0.020	-0.081**	-0.077**	-0.077**	-0.077**	-0.081**	-0.079**
	(-0.311)	(-1.173)	(-0.353)	(-2.109)	(-1.998)	(-1.997)	(-2.022)	(-2.127)	(-2.064)
Tar_MTB	0.002	0.007	0.030	0.020	0.013	0.014	0.017	0.022	0.017
	(0.088)	(0.388)	(1.345)	(0.997)	(0.670)	(0.716)	(0.855)	(1.129)	(0.880)
Tar_Lev	0.290	0.296	-0.047	0.198	0.314	0.301	0.250	0.154	0.244
	(1.006)	(1.023)	(-0.102)	(0.652)	(1.026)	(0.974)	(0.804)	(0.497)	(0.809)
Tar_ROE	-0.044	-0.096	-0.177	-0.221	-0.149	-0.153	-0.166	-0.205	-0.179
	(-0.334)	(-0.728)	(-1.054)	(-1.539)	(-1.140)	(-1.165)	(-1.256)	(-1.521)	(-1.325)
Tender	-2.157***	-2.137***	-2.098***	-2.119***	-2.133***	-2.130***	-2.123***	-2.124***	-2.125***
	(-7.674)	(-7.594)	(-5.669)	(-7.482)	(-7.539)	(-7.536)	(-7.504)	(-7.472)	(-7.505)
Competition	2.219***	2.228***	2.450***	2.228***	2.225***	2.225***	2.228***	2.228***	2.225***
	(14.186)	(14.275)	(11.390)	(14.260)	(14.269)	(14.269)	(14.281)	(14.238)	(14.221)
Toehold	0.175	0.193	0.613*	0.186	0.195	0.195	0.193	0.184	0.186
	(0.651)	(0.714)	(1.804)	(0.685)	(0.717)	(0.716)	(0.712)	(0.676)	(0.683)
Hostile	4.207***	4.189***	4.342***	4.185***	4.179***	4.181***	4.185***	4.199***	4.184***
	(18.646)	(18.591)	(13.239)	(18.414)	(18.399)	(18.394)	(18.417)	(18.360)	(18.469)
Cash	-0.080	-0.085	-0.086	-0.077	-0.092	-0.089	-0.082	-0.064	-0.078
	(-0.477)	(-0.507)	(-0.343)	(-0.462)	(-0.546)	(-0.531)	(-0.488)	(-0.383)	(-0.467)
Stock	-0.047	-0.042	0.218	-0.013	-0.023	-0.023	-0.019	-0.004	-0.015
	(-0.313)	(-0.277)	(0.936)	(-0.088)	(-0.156)	(-0.152)	(-0.123)	(-0.026)	(-0.098)
Same_Ind	-0.361***	-0.372***	-0.453***	-0.386***	-0.384***	-0.387***	-0.390***	-0.387***	-0.386***
	(-2.935)	(-3.019)	(-2.581)	(-3.133)	(-3.108)	(-3.129)	(-3.167)	(-3.135)	(-3.131)
Constant	-1.981***	-1.665***	-1.511**	-1.376***	-1.424***	-1.415***	-1.394***	-1.369***	-1.399***
	(-4.251)	(-3.624)	(-2.414)	(-3.167)	(-3.276)	(-3.258)	(-3.215)	(-3.152)	(-3.223)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,789	3,789	1,774	3,789	3,789	3,789	3,789	3,789	3,789
Pseudo R-squared	0.342	0.339	0.382	0.339	0.339	0.338	0.339	0.340	0.339

Panel E: Logistic regressions of the likelihood of the deal price downward renegotiation

Variables	*Dep. Var. = Renegotiated*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**18.074*** **								
	(2.895)								
Tar_BidAsk		**11.171****							
		(2.537)							
Tar_R&D_nonmiss			**0.068**						
			(0.150)						
Tar_R&D_ratio				**-0.761**					
				(-0.648)					
Tar_R&D_0					**0.286**				
					(1.118)				
Tar_R&D_1						**0.346**			
						(1.297)			
Tar_R&D_3							**0.085**		
							(0.302)		
Tar_R&D_7								**0.058**	
								(0.190)	
Tar_R&D_10									**-0.203**
									(-0.583)
Tar_Size	0.044	0.013	-0.056	-0.056	-0.053	-0.051	-0.050	-0.050	-0.055
	(0.558)	(0.168)	(-0.455)	(-0.772)	(-0.747)	(-0.721)	(-0.702)	(-0.707)	(-0.762)
Tar_MTB	-0.077**	-0.074*	-0.089	-0.059	-0.072*	-0.073*	-0.065	-0.064	-0.059
	(-1.983)	(-1.892)	(-1.253)	(-1.379)	(-1.684)	(-1.700)	(-1.504)	(-1.511)	(-1.396)
Tar_Lev	-0.142	-0.136	-0.550	-0.108	0.067	0.113	-0.015	-0.028	-0.118
	(-0.250)	(-0.239)	(-0.557)	(-0.180)	(0.114)	(0.193)	(-0.026)	(-0.047)	(-0.194)
Tar_ROE	0.187	0.168	0.108	-0.045	0.050	0.058	0.020	0.017	-0.033
	(0.807)	(0.715)	(0.247)	(-0.166)	(0.199)	(0.232)	(0.080)	(0.064)	(-0.124)
Tender	-1.041**	-1.029**	-1.457**	-0.951*	-1.022**	-1.025**	-0.979*	-0.972*	-0.955*
	(-2.089)	(-2.075)	(-2.191)	(-1.910)	(-2.024)	(-2.035)	(-1.959)	(-1.952)	(-1.919)
Competition	-1.080	-1.054	-1.415	-1.034	-1.064	-1.050	-1.035	-1.027	-1.046
	(-1.190)	(-1.166)	(-0.981)	(-1.153)	(-1.179)	(-1.170)	(-1.155)	(-1.148)	(-1.162)
Toehold	0.554	0.644	-0.100	0.688	0.727	0.725	0.684	0.680	0.671
	(0.976)	(1.173)	(-0.077)	(1.221)	(1.297)	(1.296)	(1.211)	(1.206)	(1.190)
Hostile	-0.566	-0.588	0.169	-0.692	-0.659	-0.650	-0.671	-0.673	-0.692
	(-0.596)	(-0.626)	(0.155)	(-0.734)	(-0.708)	(-0.697)	(-0.713)	(-0.715)	(-0.733)
Cash	-0.777**	-0.788**	-0.620	-0.744**	-0.790**	-0.808**	-0.763**	-0.758**	-0.739**
	(-2.136)	(-2.165)	(-1.316)	(-2.081)	(-2.218)	(-2.259)	(-2.112)	(-2.096)	(-2.071)
Stock	-0.081	-0.090	0.117	0.004	-0.011	-0.021	-0.007	-0.005	0.007
	(-0.299)	(-0.329)	(0.247)	(0.015)	(-0.043)	(-0.080)	(-0.027)	(-0.020)	(0.025)
Same_Ind	-0.031	-0.044	0.180	-0.116	-0.066	-0.062	-0.101	-0.105	-0.112
	(-0.126)	(-0.178)	(0.464)	(-0.469)	(-0.265)	(-0.247)	(-0.410)	(-0.425)	(-0.455)
Constant	-0.950	-0.657	0.392	0.013	-0.218	-0.269	-0.052	-0.048	-0.008
	(-0.613)	(-0.433)	(0.217)	(0.009)	(-0.146)	(-0.181)	(-0.035)	(-0.033)	(-0.005)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,935	1,935	811	1,935	1,935	1,935	1,935	1,935	1,935
Pseudo R-squared	0.0844	0.0817	0.135	0.0749	0.0761	0.0768	0.0744	0.0744	0.0749

Panel F: Logistic regressions of the likelihood of the acquirer's post-acquisition reporting of goodwill impairment

Variables	*Dep. Var. = GW_Impairment*								
	1	2	3	4	5	6	7	8	9
Tar_Vol	**20.052*** (4.823)**								
Tar_BidAsk		**15.011*** (4.594)**							
Tar_R&D_nonmiss			**-0.282 (-1.356)**						
Tar_R&D_ratio				**0.552 (0.771)**					
Tar_R&D_0					**0.432*** (2.741)**				
Tar_R&D_1						**0.319** (2.012)**			
Tar_R&D_3							**0.167 (1.011)**		
Tar_R&D_7								**0.188 (1.094)**	
Tar_R&D_10									**0.136 (0.724)**
Tar_Size	0.235***	0.215***	0.103*	0.161***	0.148***	0.152***	0.156***	0.158***	0.159***
	(4.811)	(4.476)	(1.659)	(3.485)	(3.198)	(3.298)	(3.384)	(3.418)	(3.444)
Tar_MTB	-0.016	-0.016	-0.018	-0.005	-0.014	-0.010	-0.005	-0.005	-0.004
	(-0.697)	(-0.685)	(-0.617)	(-0.186)	(-0.557)	(-0.408)	(-0.195)	(-0.214)	(-0.160)
Tar_Lev	0.054	0.062	-1.194***	0.062	0.252	0.203	0.117	0.122	0.074
	(0.169)	(0.193)	(-2.615)	(0.193)	(0.778)	(0.630)	(0.361)	(0.376)	(0.229)
Tar_ROE	0.024	0.045	0.073	-0.107	-0.089	-0.105	-0.126	-0.119	-0.129
	(0.150)	(0.279)	(0.367)	(-0.577)	(-0.536)	(-0.630)	(-0.744)	(-0.697)	(-0.749)
Tender	0.241	0.230	0.242	0.269	0.212	0.234	0.261	0.272	0.275
	(1.223)	(1.166)	(1.067)	(1.366)	(1.085)	(1.195)	(1.325)	(1.389)	(1.403)
Competition	-0.626*	-0.617*	-0.991*	-0.600*	-0.592*	-0.601*	-0.607*	-0.615*	-0.612*
	(-1.709)	(-1.690)	(-1.830)	(-1.657)	(-1.664)	(-1.682)	(-1.691)	(-1.700)	(-1.689)
Toehold	0.722*	0.729*	0.211	0.781*	0.860**	0.833*	0.807*	0.806*	0.799*
	(1.774)	(1.793)	(0.306)	(1.869)	(2.000)	(1.955)	(1.906)	(1.902)	(1.897)
Hostile	-0.231	-0.223	-1.244	-0.291	-0.323	-0.309	-0.307	-0.304	-0.302
	(-0.334)	(-0.318)	(-1.437)	(-0.419)	(-0.461)	(-0.442)	(-0.440)	(-0.437)	(-0.433)
Cash	0.005	0.001	-0.045	0.034	-0.037	-0.022	0.016	0.017	0.030
	(0.030)	(0.005)	(-0.190)	(0.197)	(-0.206)	(-0.124)	(0.092)	(0.100)	(0.171)
Stock	-0.047	-0.061	0.462*	-0.024	-0.006	-0.017	-0.021	-0.028	-0.026
	(-0.270)	(-0.345)	(1.728)	(-0.137)	(-0.037)	(-0.098)	(-0.123)	(-0.158)	(-0.148)
Same_Ind	-0.094	-0.084	0.005	-0.155	-0.096	-0.122	-0.146	-0.156	-0.156
	(-0.629)	(-0.560)	(0.025)	(-1.054)	(-0.633)	(-0.813)	(-0.986)	(-1.060)	(-1.062)
Constant	-5.702***	-5.574***	-3.010**	-4.734***	-4.821***	-4.774***	-4.745***	-4.749***	-4.728***
	(-5.050)	(-4.930)	(-2.398)	(-4.175)	(-4.258)	(-4.216)	(-4.181)	(-4.185)	(-4.164)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,524	1,524	753	1,524	1,524	1,524	1,524	1,524	1,524
Pseudo R-squared	0.0938	0.0941	0.0866	0.0826	0.0872	0.0848	0.0829	0.0830	0.0825

This table presents the results of testing H2 – H7 when using alternative specifications of measuring the target's information asymmetry. *Tar_Vol* is the target's idiosyncratic stock return volatility and is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. *Tar_BidAsk* is the target's bid-ask spread and is estimated as the daily spread between the CRSP bid (low) and ask (high) scaled by the spread midpoint, averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64). *Tar_R&D_nonmiss* is an indicator variable that equals one if the target firm has a percentage of R&D to total assets that is higher than 5%, and zero otherwise (targets with missing data about R&D expenditures are excluded). *Tar_R&D_ratio* is the ratio of the target's R&D expenditures to total assets. *Tar_R&D_0, Tar_R&D_1, Tar_R&D_3, Tar_R&D_7, and Tar_R&D_10* are indicator variables that equal one if the target firm has a percentage of R&D to total assets that is higher than 0%, 1%, 3%, 7% and 10%, respectively, and zero otherwise. Definitions of all other variables are provided in Table 3.1. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*- or *z*-statistics are reported under coefficients (in parentheses). *t*- or *z*- statistics are based on robust standard errors that are doubled (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Table A.3.3
Cross-sectional differences in the association between target's information asymmetry and takeover premium

Panel A: Analyses of subsamples based on the target's Tobin's Q ratio

Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*
	1	2	3	4	5	6
Tar_Vol	**0.212*** **	**0.276*** **				
	(4.307)	**(5.175)**				
Tar_BidAsk			**0.145*** **	**0.269*** **		
			(3.228)	**(5.057)**		
Tar_R&D					**0.084***	**0.088*** **
					(1.665)	**(3.671)**
Tar_Size	-0.032***	-0.013	-0.041***	-0.015*	-0.049***	-0.033***
	(-3.611)	(-1.449)	(-4.865)	(-1.733)	(-6.170)	(-4.322)
Tar_MTB	-0.066**	0.001	-0.071***	0.001	-0.087***	0.003
	(-2.444)	(0.421)	(-2.605)	(0.365)	(-3.021)	(0.928)
Tar_Lev	-0.159**	-0.017	-0.146**	-0.010	-0.107	0.012
	(-2.429)	(-0.252)	(-2.232)	(-0.158)	(-1.622)	(0.170)
Tar_ROE	0.092*	-0.047*	0.083*	-0.049**	0.070	-0.050**
	(1.880)	(-1.919)	(1.700)	(-1.984)	(1.416)	(-2.063)
Tender	0.026	0.129***	0.030	0.132***	0.030	0.133***
	(0.634)	(4.080)	(0.729)	(4.127)	(0.726)	(4.126)
Competition	0.156***	0.187***	0.159***	0.190***	0.164***	0.171***
	(2.757)	(2.862)	(2.780)	(2.918)	(2.890)	(2.629)
Toehold	-0.058	-0.155***	-0.057	-0.157***	-0.058	-0.145***
	(-1.270)	(-3.292)	(-1.245)	(-3.328)	(-1.314)	(-3.189)
Hostile	0.040	-0.030	0.040	-0.028	0.041	-0.041
	(0.955)	(-0.663)	(0.952)	(-0.609)	(0.962)	(-0.898)
Cash	0.040	0.064**	0.039	0.062**	0.040	0.054*
	(1.285)	(2.133)	(1.256)	(2.039)	(1.285)	(1.744)
Stock	-0.011	0.048	-0.011	0.046	-0.007	0.057*
	(-0.409)	(1.524)	(-0.423)	(1.450)	(-0.283)	(1.784)
Same_Ind	-0.004	0.026	-0.006	0.024	-0.012	0.022
	(-0.124)	(1.155)	(-0.208)	(1.054)	(-0.404)	(0.959)
Constant	0.568***	0.196**	0.644***	0.227***	0.723***	0.367***
	(6.811)	(2.167)	(7.954)	(2.657)	(9.107)	(4.897)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,263	1,263	1,263	1,263	1,263	1,263
R-squared	0.149	0.155	0.143	0.154	0.138	0.145

Panel B: Analyses of subsamples based on the target's MTB ratio

Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*
	1	2	3	4	5	6
Tar_Vol	**0.220*** **	**0.278*** **				
	(4.562)	**(5.287)**				
Tar_BidAsk			**0.114** **	**0.262*** **		
			(2.542)	**(5.559)**		
Tar_R&D					**0.100** **	**0.071*** **
					(2.460)	**(2.610)**
Tar_Size	-0.030***	-0.006	-0.041***	-0.010	-0.048***	-0.027***
	(-3.225)	(-0.707)	(-4.708)	(-1.206)	(-5.884)	(-3.423)
Tar_MTB	-0.009	0.004	-0.013	0.003	-0.012	0.006*
	(-0.761)	(1.143)	(-1.065)	(1.051)	(-0.989)	(1.671)
Tar_Lev	-0.074	-0.064	-0.060	-0.060	-0.023	-0.059
	(-1.016)	(-1.011)	(-0.815)	(-0.934)	(-0.310)	(-0.886)
Tar_ROE	0.047	-0.047*	0.040	-0.048*	0.039	-0.059**
	(1.352)	(-1.853)	(1.159)	(-1.939)	(1.126)	(-2.363)

Tender	0.064*	0.111***	0.070*	0.112***	0.066*	0.116***
	(1.650)	(3.268)	(1.816)	(3.294)	(1.747)	(3.369)
Competition	0.095**	0.243***	0.098**	0.252***	0.104**	0.236***
	(1.971)	(3.155)	(2.008)	(3.263)	(2.162)	(3.066)
Toehold	-0.071	-0.061	-0.072	-0.065	-0.075*	-0.054
	(-1.617)	(-0.938)	(-1.626)	(-0.993)	(-1.725)	(-0.825)
Hostile	0.039	-0.057	0.041	-0.052	0.038	-0.056
	(1.060)	(-1.074)	(1.111)	(-0.983)	(1.016)	(-1.056)
Cash	0.060*	0.023	0.059*	0.022	0.055*	0.017
	(1.914)	(0.717)	(1.856)	(0.679)	(1.739)	(0.516)
Stock	0.016	-0.032	0.017	-0.036	0.018	-0.027
	(0.531)	(-0.995)	(0.580)	(-1.100)	(0.593)	(-0.828)
Same_Ind	-0.001	0.027	-0.007	0.024	-0.010	0.020
	(-0.026)	(1.205)	(-0.242)	(1.058)	(-0.360)	(0.888)
Constant	0.383***	0.166*	0.483***	0.208**	0.530***	0.342***
	(4.520)	(1.794)	(5.896)	(2.331)	(6.726)	(3.936)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,263	1,263	1,263	1,263	1,263	1,263
R-squared	0.118	0.152	0.107	0.151	0.108	0.137

This table presents the results of examining the relation between the target's information asymmetry and the takeover premium for subsamples of target firms with high versus low pre-acquisition valuations. The dependent variable is *Prem_4w* and is defined as the ratio of the share price offered by the bidder to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. The sample of target firms is divided into three quantiles based on the target's Tobin's Q and MTB ratios. The target firm is classified as with low (high) pre-acquisition valuation if the target is in the lowest (highest) quantile of the sample. Tobin's Q is calculated as the ratio of the total of the target's market value of equity and liabilities to its total assets. MTB is the ratio of the target's market value of equity to its book value of equity. Both Tobin's Q and MTB are calculated at the end of the target's fiscal year preceding the deal announcement date. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors that are doubled (two-way) clustered by both year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 3.1.

Chapter 4

Target-firm conservative accounting and takeover premium

4.1 Introduction

The takeover premium represents the increase in the price offered by a bidder to target shareholders relative to the target's pre-acquisition share price. Evidence shows that bidders offer large premiums to target shareholders to get control over target firms (e.g., Eckbo, 2009; Chatterjee et al., 2012). In addition, a huge body of research documents that target shareholders typically earn large positive abnormal returns while acquirer shareholders achieve negative, zero, or mildly positive abnormal returns around the announcement of the takeover transaction.[26] It has been argued for a long time that large premiums offered to target shareholders as well as the neutral- or destroying-value effect of M&A transactions for bidder shareholders are due to bidder overpayment to target shareholders (e.g., Black, 1988; Morck et al., 1990; Eccles et al., 1999; Hietala et al., 2002; Harford et al., 2012; de Bodt et al., 2018). This means that the bidder pays more than the intrinsic value of the target firm and the expected synergies of the acquisition. Different explanations and theories have been suggested in the literature to interpret bidder overpayment. A main explanation is that bidders overestimate the true value of the target firm and that the winning bidder is typically the one who most excessively overestimates this value, and this is referred to as "*the winner's curse*" (Capen et al., 1971; Thaler, 1988).

The probability that a bidder falls in the winner's curse increases when uncertainty about the target's value increases (e.g., Bazerman & Samuelson, 1983; Varaiya & Ferris, 1987; McNichols & Stubben, 2015). As noted by Rogo (2009), this uncertainty arises from incomplete information about targets and, consequently, bidders' dependence on expectations regarding information they are not able to directly observe. This valuation uncertainty confronting bidders because of incomplete information about targets could be

[26] See, for instance, Andrade et al. (2001) and Eckbo (2009) for a review of the literature.

decomposed into two components: symmetric and asymmetric uncertainty. Symmetric uncertainty reflects the target's inherent business or business-specific uncertainty that both target insiders and outsiders, including bidders, equally face. However, asymmetric uncertainty reflects uncertainty arising from the target's private information that target managers have but not outsiders and from the low quality of the target's disclosure.

This study explores the role of the target-firm conservative accounting in helping bidders to bid more effectively and avoid overestimating the target's value by mitigating the adverse consequences of uncertainty about this value. Prior literature has provided evidence that accounting conservatism helps users in both the debt and equity markets (e.g., Ahmed et al., 2002; LaFond & Watts, 2008; Wittenberg-Moerman, 2008; Zhang, 2008; Nikolaev, 2010; Kim et al., 2013; García Lara et al., 2014; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017; Kang et al., 2017). However, there is very limited evidence on whether and how accounting conservatism is beneficial for participants in the mergers and acquisitions (M&As) market. Two studies by Francis and Martin (2010) and Kravet (2014) show that accounting conservatism of the bidding firm helps to mitigate the agency conflicts between the bidder's managers and shareholders and, therefore, leads to better acquisition investments. This study, however, investigates whether accounting conservatism of target firms helps mitigate the adverse consequences of uncertainty about the true values of target firms and, therefore, helps bidders to avoid overpayment by offering lower premiums to target firms. In addition, this study examines whether the association between target-firm conservative accounting and takeover premium differs cross-sectionally according to the different levels of targets' ex ante asymmetric information.

Conservative accounting refers to the asymmetric verification requirements by accountants and policies for recognising economic gains versus losses (Watts, 2003a). Basu (1997) interprets the asymmetric verification requirements for economic gains and losses of conservative accounting as earnings reflect economic bad news more quickly than good news.[27] There is a long-standing debate in the standard-setters circle on the benefits and costs of accounting conservatism to users of accounting information. In 2010, the Financial Accounting Standard Board (FASB) and the International Accounting

[27] This study focuses on conditional rather than unconditional conservative accounting that refers to tendencies to earlier recognition of losses and deferred recognition of gains independent from economic bad and good news. Examples of unconditional conservatism include the use of accelerated depreciation methods, the accumulation of excessive reserves such as the allowance for doubtful accounts and the use of LIFO inventory. For more discussion about the difference between conditional and unconditional conservatism, see, for example, Beaver and Ryan (2005) and Mora and Walker (2015).

Standard Board (IASB) eliminated the conservatism/prudence principle from their joint conceptual framework. In 2018, the principle was reintroduced in the Conceptual Framework of the IASB-only project; however, the U.S. GAAP did not follow this movement. It would be of a particular interest to regulators and standard-setters to know whether accounting conservatism of U.S. firms plays a role in the efficient allocation of economic resources. Therefore, this study attempts to fulfil this objective by examining the role of accounting conservatism in a less explored context (i.e., the M&A market). This would inform the debate on the benefits and costs of accounting conservatism and demonstrate whether the opposite orientation of the U.S. GAAP toward conservatism benefits users in the M&A market.

I argue that the target's conservative accounting helps bidders to bid more effectively and avoid overpayment by firstly increasing the credibility of accounting information in public financial statements of target firms. This is consistent with Watts (2003a) who argues that managers tend to overestimate unverifiable future gains but underestimate unverifiable future losses and, consequently, stronger (lower) verification requirements by conservative accounting to recognise unverifiable future gains (losses) makes information that accounting provides on current performance "hard".

I also argue that the target's conservative accounting would reduce uncertainty about the target's value by decreasing the potential adverse selection by the target's managers resulting from asymmetric information between the target's managers and bidders. That is, conservative accounting helps reduce adverse selection problems of managers by reducing their opportunistic incentives to overstate earnings and net assets as well as constraining their abilities to hide bad information (e.g., Watts, 2003a; D'Augusta et al., 2016; Kim & Zhang, 2016).

Furthermore, "hard" information provided by conservative accounting plays a disciplining role for sources of "soft" information such as management and financial analysts, by serving a credible benchmark for such "soft" information sources. Moreover, by depending on the "hard" information provided by conservative accounting, investors can assess the accuracy and reliability of predictions provided by different "soft" information sources (e.g., Watts, 2006; LaFond & Watts, 2008; D'Augusta, 2018; D'Augusta & DeAngelis, Forthcoming). Therefore, I argue that the target's conservative accounting plays a role in disciplining other sources of information of target firms that, in turn, would reduce the divergence of opinions among bidders and help them to accurately value the target firm.

Accordingly, taking the winner's curse as a basis, this study predicts that, in a context of asymmetric information between targets and acquirers, the target's conservative accounting can alleviate the adverse consequences of the high uncertainty about the target's true value and, consequently, help acquirers to avoid overpaying for target shareholders. In particular, this study conjectures that the association between the target's conservative accounting and the takeover premium to be negative. As the uncertainty about the target's value increases the probability and magnitude of the winner's curse (e.g., Bazerman & Samuelson, 1983; McNichols & Stubben, 2015), this study also hypothesises to find a stronger negative association between the target's conservative accounting and the takeover premium when the target's ex ante information asymmetry is higher.

To test hypotheses, this study uses a sample of 1,434 completed M&A deals between U.S. publicly listed companies announced over the period from 1/1/1986 to 31/12/2017. Following Boone and Mulherin (2007) and Skaife and Wangerin (2013), this study defines the takeover premium as the ratio of the share price offered by the winning acquirer to the target's shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. The target's conservative accounting is primarily measured using the Basu (1997) asymmetric timeliness measure. Basu (1997) operationalises conservatism by depending on the notion of its impact on earnings' quicker reflection of bad news than good news and the use of negative and positive stock returns to proxy for bad and good news, respectively. Basu (1997) measure has been extensively used in the literature to examine both determinants and consequences of conservative accounting. This study uses two versions of Basu (1997) measure: the original Basu earnings-based measure and a modified accruals-based Basu measure, as suggested by Collins et al. (2014). To capture the target's commitment to conservative accounting practices prior to the acquisition, Basu's (1997) measure is estimated for target firms over a pooled cross-section time-series window of five years ending at the target's latest fiscal year-end prior to the acquisition announcement date.

This study follows Nikolaev (2010) and Kravet (2014) and uses a two-stage approach as a research design to control for potential confounding variables that possibly affect the takeover premium, as well as avoiding the multicollinearity problem arising from over-interaction with the conservatism measure when using the standard one-stage approach. In particular, in the first stage, the takeover premium is regressed on a vector

of control variables that might be correlated with the takeover premium or the target's conservative accounting. These variables include controls for both target and acquirer firms-specific characteristics as well as several deal characteristics. In the second stage, residuals obtained from the first-stage regression (representing unexplained or unexpected part of the takeover premium) are then interacted with variables of Basu (1997) measure of conservatism to test the association between the target's conservative accounting and the takeover premium.

The results show that the target's conservative accounting is negatively associated with the takeover premium, suggesting that the winning acquirer pays a lower premium when the target firm adopts higher degrees of conservative reporting over the years leading to the acquisition. These results are consistent with predictions of the winner's curse and divergence of opinions among bidders and suggest that conservative accounting of target firms mitigates the adverse effects of the high uncertainty about the target's value and, therefore, helps acquirers to avoid overpayment.

To test the second hypothesis, this study uses three proxies for the target's ex ante asymmetric information: the target's idiosyncratic stock return volatility, bid-ask spread, and firm size. The full sample of firm-year observations is split into two subsamples based on the level of the target's ex ante asymmetric information. Target firms with high stock return volatility, high bid-ask spread, or small size are classified as with high ex ante asymmetric information. The results show that the significant negative association between the target's conservative accounting and the takeover premium holds only when the target's ex ante asymmetric information is high. The results also demonstrate that the negative association in the high asymmetric information subsample is stronger than that in the full sample. Therefore, consistent with the predictions of the winner's curse and the divergence of opinions among bidders, the results suggest that the target's conservative accounting helps bidders to bid more effectively and value the target firm more precisely by mitigating the negative consequences of the high uncertainty about the target's value.

The results of this study are robust to several sensitivity analyses. First, as the takeover premium is measured in the main analysis based on the price *actually offered or paid* by the winning acquirer to target shareholders that can be influenced by private information obtained by acquirers during the transactional diligence review, this study alternatively uses the *initial* offer price to calculate the takeover premium. The results are robust to the use of this alternative measure of the takeover premium. Second, to avoid incorrect inferences associated with the two-stage approach (as noted by Chen et al.

(2018b) and Christodoulou et al. (2018)), this study re-tests hypotheses using the standard one-stage approach and obtains consistent results. Third, two alternative measures of the target's conservative accounting are used: Ball and Shivakumar (2005) accruals-based measure and Khan and Watts (2009) firm-year *C_Score* measure. The results are consistent with those reported in the main analysis. Fourth, the results are also robust to a different specification of Basu (1997) measure that considers concerns about endogeneity. Fifth, the results are robust after controlling for the potential confounding effect of the target's ex ante asymmetric information, supporting the incremental effect of the target's conservative accounting on the takeover premium. Finally, the results are robust to the use of a larger sample of 2,652 M&A deals after relaxing one criterion of the sample selection.

This study makes two main contributions to the literature. First, this study contributes to the prior literature addressing the economic consequences of conservative accounting for users in the equity and debt markets (e.g., Ahmed et al., 2002; Beatty et al., 2008; Wittenberg-Moerman, 2008; Zhang, 2008; Kim et al., 2013; Balakrishnan et al., 2016; Kim & Zhang, 2016; Goh et al., 2017; Kim, 2018). Although prior studies show that conservative accounting is beneficial for both debtholders and stockholders, it is unknown whether and how conservative accounting of target firms is beneficial for acquiring firms in the market for corporate control. This study provides new empirical evidence that conservative accounting of target firms plays an important role in shaping the M&A decision of acquiring firms. The results suggest that accounting conservatism helps mitigate the adverse consequences of uncertainty about the true values of target firms and, therefore, helps bidders to avoid overpayment by offering lower premiums to target firms, particularly when targets' ex ante asymmetric information is high.

Second, there is a growing research stream addressing the role of accounting quality in reducing uncertainty about the true value of the target firm and, therefore, affecting acquisition performance and dynamics (e.g., Raman et al., 2013; Skaife & Wangerin, 2013; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Martin & Shalev, 2017; Chen et al., 2018a). These studies focus on the general measures of accounting quality such as earnings quality, stock return nonsynchronicity, and aggregated scores of accounting quality. However, it is unclear the role that individual qualitative characteristics of accounting information, such as accounting conservatism, might play in shaping participants' decisions in the M&As market. Moreover, there is an ongoing debate on advantages and disadvantages of accounting conservatism within both the

standard setters' as well as academics' circles. Therefore, this study informs this debate and contributes to this growing research stream by providing new evidence on the informational role of accounting conservatism of target firms in the market for corporate control.

The remainder of this chapter is organised as follows. Section 2 reviews the literature. Section 3 develops the research hypotheses. Section 4 describes the research methodology and presents measures of the target's conservative accounting and the takeover premium. Sections 5 and 6 present the sample and the descriptive statistics, respectively. Empirical results and robustness checks are reported in sections 7 and 8, respectively. Section 9 concludes the chapter.

4.2 Literature review

The takeover premium represents the increase in the price offered by the bidder to target shareholders relative to the target's pre-merger share price. In determining the target's pre-merger share price, prior studies use different reference or base prices (such as one day, one week, a month, two and three months prior to the deal announcement date) to scale the bid offer and estimate the takeover premium. Evidence shows that bidders usually offer large premiums to targets' shareholders in order to get control over target firms. For instance, Chatterjee et al. (2012) show that the average takeover premium a winning or successful bidder offers to target shareholders equals 62.7% when the premium is estimated based on the target's share price about three months (the trading day -64) prior to the deal announcement date. Moreover, the literature shows that target shareholders typically earn large positive abnormal returns while acquirer shareholders achieve negative, zero, or mildly positive abnormal returns around the announcement of the takeover transaction (see, for example, Andrade et al., 2001; Eckbo, 2009).

It has been argued that a main reason for M&A decisions being value-neutral or value-destroying for acquirer shareholders is the overpayment by acquirers to target shareholders, representing in offering and paying large premiums (e.g., Black, 1988; Andrade et al., 2001; Moeller et al., 2005). Despite the considerable amount of research on takeover dynamics and outcomes, sources of overpayment in takeovers still represent a continuing puzzle. Prior studies have proposed different theories to explain why acquirers might incur large premiums or overpay in takeovers. The winner's curse is one of the prominent theories that have been widely employed by prior studies as a basis for

explaining overpayment in takeovers. Based on the predictions of the winner's curse, the winning bidder overestimates the target's true value. Furthermore, uncertainty about the true value of the target and competition between bidders increase the vulnerability of the winning bidder to suffer from the winner's curse or overpayment.[28]

Uncertainty about the target's intrinsic value generates from incomplete information about the target firm and, therefore, bidders' dependence on expectations regarding information they are not able to directly observe. McNichols and Stubben (2015) note that information asymmetry that exists between the target's insiders and outsiders is not the only source for uncertainty bidders face. There are other general information uncertainties that might comprise the overall uncertainty about the target value. Rogo (2009) decomposes valuation uncertainty confronting bidders because of incomplete information about targets into two components: symmetric uncertainty and asymmetric uncertainty.

Symmetric uncertainty reflects the target's inherent business or business-specific uncertainty, which both target insiders and outsiders, including bidders, equally face. Asymmetric uncertainty reflects uncertainty arising from the low quality of the target's disclosure and informational advantages that target managers have over outsiders. Rogo (2009) decomposes asymmetric uncertainty, in turn, based on reasons of withholding private information by target managers, into two sub-components: proprietary and non-proprietary. Asymmetric uncertainty arising from proprietary information is the uncertainty that results from the bidder's lack of knowledge about the target's proprietary private information withheld by target managers such as information about know-how and competitive advantages. However, asymmetric uncertainty arising from non-proprietary information is the uncertainty that originates from the target's non-proprietary private information withheld by target managers, probably because of agency conflicts such as bad news opportunistically withheld by managers to achieve private benefits.

In contrast to explanations of the winner's curse and divergence of opinions among bidders that mainly focus on the bidder's irrational overestimation of the target's value, Hansen (1987) focuses on the consequences of the target's asymmetric information and its related adverse selection risk by target managers on the bidder's rational decisions. Hansen (1987) theorises that the decision to choose between cash and stock as payment methods in M&A transactions is based on uncertainty bidders face due to target

[28] See Chapter 2 for a detailed discussion of the winner's curse explanation in the M&A market.

information asymmetry and adverse selection risk. By treating the process of an acquisition transaction as a bargaining game between two agents under imperfect information, Hansen (1987) shows that acquiring firms prefer to use stock in deals involving targets who know their true values better than acquirers do. He argues that, in cash offers, acquirers might face a "lemons" problem if targets have proprietary information about true values of their assets, that is, target managers will not accept the deal unless the offer is greater than the target's value. Therefore, to protect themselves against the risk that the target is a "lemon", acquirer uses stock as it has a contingent-pricing advantage compared to cash. In a stock offer, if the acquirer overpays for a "lemon" target, both acquirer and target shareholders share any ex post losses in the stock price of the merged entity arising from that overpayment.

Consistent with Hansen's (1987) predictions, Officer et al. (2009) empirically show that acquirers consider the target's information asymmetry when they decide on the method of payment in M&A transactions. They find that acquirers are more likely to use stock-swap, because of its contingent pricing advantage, when the target is difficult-to-value, as measured by the target's high level of information asymmetry. They argue that, by swapping stock, acquirers share risks arising from the uncertainty over the target's value arising from high information asymmetry with target shareholders. Moreover, they demonstrate that announcement returns are higher for acquirers who use stock for paying difficult-to-value targets, irrespective of whether the target is publicly or privately traded firm.

In a similar vein, Dionne et al. (2015) examine whether asymmetric information between bidders about the true value of the target influences premiums they offer in M&A deals. Specifically, they find that better-informed bidders, as proxied by M&A deals undertaken by targets' blockholders, pay much lower bid premiums. Therefore, their findings suggest that better-informed bidders are less vulnerable to fall victims in the overpayment problem. Amel-Zadeh and Zhang (2015) also find that firms experiencing financial restatements are less likely to receive bids (i.e., become targets) relative to a matched sample of non-restating firms. They also find that deals involving restating targets are more likely to be withdrawn and take longer periods to be completed than non-restating targets. In addition, they provide some evidence that financial restatements lead to decreasing deal value multiples. Therefore, they contend that as financial restatement signals for target high information risk, it represents a determinant in the selection of target firms in the takeover market and has consequences on the outcomes of takeovers.

An emerging research stream addresses the role that the target's accounting quality plays in mitigating the negative consequences of asymmetric uncertainty between bidders and targets and, consequently, influencing M&A deal dynamics and outcomes (e.g., Raman et al., 2013; Skaife & Wangerin, 2013; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Martin & Shalev, 2017; Chen et al., 2018a). For instance, using a constructed score for measuring targets' financial reporting quality that combines five proxies; namely, discretionary accruals, the effectiveness of internal control, off-balance sheet liabilities, the accuracy of analyst forecasts, and the dispersion of analyst forecasts, Skaife and Wangerin (2013) report that deals incorporating targets with lower reporting quality have higher premiums. Thus, they argue that the target's value perceived by acquirers at the time of signing an agreement is higher than the value perceived by investors of the target with low reporting quality. Skaife and Wangerin (2013) also find that deals involving targets with low reporting quality are more likely to be terminated or renegotiated to reduce the purchase price. They argue that by getting access to more private information during the transactional due diligence stage after signing an acquisition agreement, the bidder may realise if there are any breaches for warranties made by targets in the agreement about the reliability and the representational faith fulness of their financial statements. Moreover, they reveal that targets with low reporting quality scores in failed deals are more likely to restate their financial statements soon after the termination of these deals.

The findings by Skaife and Wangerin (2013) suggest that acquirers overestimate the value of targets with low reporting quality who aggressively report their operating performance and financial position (by, for example, deferring losses or accelerating revenues and reporting larger off-balance-sheet liabilities). This argument is more supported by their findings of acquirers' subsequent consideration of their initial overbidding by terminating deals or downward renegotiating the purchase price. Moreover, the finding that target firms in terminated deals are more likely to subsequently restate their financial statements also supports the same argument.

Using a sample of U.S. takeovers over the period 1977-2005, Raman et al. (2013) examine how the quality of targets' earnings influence decisions made by bidders related to determining the takeover strategy, takeover premium, and payment method. They find that bidders prefer negotiated takeovers, compared to non-negotiated takeovers, when targets have low earnings quality. That is, bidders attempt to reduce the asymmetric uncertainty resulting from targets' low earnings quality by getting more private

information through negotiated takeovers. They also find a negative relation between earnings quality and takeover premiums in negotiated takeovers, suggesting that bidders get valuable private information in such negotiated takeovers. Furthermore, they document that bidders are more likely to use equity instead of cash to pay for targets with low-quality earning. This suggests that bidders attempt to reduce information risk by sharing it with current shareholders of targets with low-quality earnings. Therefore, Raman et al. (2013) confirm the importance of targets' earnings quality as a determinant of takeover decisions made by bidders particularly when the information asymmetry between bidders and targets is high, such as in inter-industry takeovers.

Raman et al. (2013) interpret their findings of high takeover premiums in negotiated acquisitions of targets with high asymmetric uncertainty, as proxied by low earnings quality, as an indication for the value-creation in these deals. They argue that the source of this value could be the effective use of the target's information-based assets, such as brands and R&D, that can increase the target's pre-merger asymmetric uncertainty, or it could be a compensation for the target's discounted value arising from its high pre-merger asymmetric uncertainty. However, their results could be alternatively explained in light of the potential overpayment by acquirers when asymmetric uncertainty over the target's value is high. That is, acquirers might bid less effectively and overestimate target firms when the earnings quality of target firms is low.

Based on a sample of U.S. takeovers from 1990 to 2010, McNichols and Stubben (2015) show that uncertainty about the target leads to decreasing acquirer's returns around acquisition announcement. After controlling for uncertainty, they find that acquirers gain higher returns around acquisition announcements when targets have a higher quality of accounting. They argue that the high quality of accounting for targets make acquirers' valuation of targets more accurate as a result of decreasing uncertainty and, therefore, making better acquisition decisions. However, they find that targets with high-quality accounting experience low returns around announcements, suggesting that acquirers obtain a higher portion of acquisition gains than targets with high accounting quality.

Despite many valuable attempts and insights provided by prior studies in exploring the role that the quality of accounting information of target firms play in the takeover market, these studies focus on general measures of accounting quality such as earnings quality and aggregated scores of accounting quality. However, the role that individual qualitative characteristics of accounting information might play in shaping participants' decisions in the mergers and acquisitions market is not clear. Therefore, this

study aims to fill this void in the literature by examining the effect of the target's conservative accounting, which represents an important qualitative characteristic of accounting information, on the takeover premium. I argue that the target's conservative accounting mitigates the negative consequences of uncertainty about the target's intrinsic value arising from the target's asymmetric information. Thus, this study expects that conservative accounting of target firms helps managers of acquiring firms to bid more effectively in the market for corporate control and, consequently, avoid the winner's curse problem and offer lower premiums to target shareholders.

4.3 Hypotheses development

Accounting conservatism represents an accounting principle that is dating back centuries (Basu, 1997). Accounting conservatism has been viewed as a crucial convention in accounting that dictates the exercise of caution in recognising and measuring accounting numbers in financial reports (Givoly & Hayn, 2000). Although its importance, there is no one generally accepted definition for conservatism. Basu (1997) and Watts (2003a; 2003b) define accounting conservatism as the asymmetric degrees of verification required by accountants and accounting policies for recognising economic gains versus losses. These requirements of asymmetric verification make the accounting value of net assets lower than its economic value (Watts, 2003a; Ruch & Taylor, 2015).[29] Basu (1997) interprets accounting conservatism as earnings reflecting economic bad news more quickly than good news. That is, using unexpected annual negative and positive stock returns to proxy for bad and good news, respectively, Basu finds that the asymmetric verification requirements of conservatism lead to earnings' quicker reflection of bad news than of good news.

Four possible explanations have been suggested in the literature for accounting conservatism: contracting, shareholder litigation, taxation, and accounting regulation (Watts, 2003a). The empirical literature shows that the contracting and shareholder

[29] As illustrated by Ball and Shivakumar (2005), economic income also differs from accounting income and this difference depends on the extent of accounting timeliness in incorporating changes in economic income. Economic income is "the change in the market value of equity, adjusted for dividends and capital contributions" (Ball & Shivakumar, 2005:86). Therefore, both current cash flows and revisions in the present value of future cash flows are incorporated in economic income. There are two models to recognise economic income – the deferred recognition and the timely recognition. According to deferred recognition, accounting income does not incorporate the changes or revisions in future cash flows and awaits until the actual realisation of these revisions whether in gains or losses. However, according to timely recognition, and by using accruals, accounting income incorporates unrealised gains or losses arising from changes and revisions of future cash flows.

litigation explanations appear to be the most important amongst these explanations (Watts, 2003b). LaFond and Watts (2008) argue that the demand for conservative accounting by contracting parties, in particular, is due to the conservatism's role in reducing agency costs arising from (1) asymmetric information and asymmetric payoff between contracting parties and (2) the inability of verifying private information of more informed parties. Many studies have supported these arguments and provided evidence on the conservatism's role for users in the debt market. For instance, studies report the usefulness of conservatism in reducing debt costs (Ahmed et al., 2002; Zhang, 2008), providing lenders with timely signals of borrowers' default risks (Zhang, 2008), and increasing the efficiency of secondary loan market by decreasing borrowers' information asymmetries (Wittenberg-Moerman, 2008).

LaFond and Watts (2008) argue that as incorporating unverifiable future gains would not reduce information asymmetry or make accounting earnings more beneficial for contracting, it would be the same for investors in the equity market. That is, when verification requirements of future gains decrease, the ability of managers to manipulate increases and the credibility of information declines, and this, therefore, makes information less useful for current and potential investors. LaFond and Watts (2008) provide evidence that even in the absence of contracting explanation, conservatism is generated as a result of information asymmetries between insiders and outsiders in the equity market, suggesting that conservatism is perceived by equity market users as a governance mechanism that reduces the adverse effects of asymmetric information.

Relatedly, Ball and Shivakumar (2005) argue that the market demand plays a vital role in shaping the quality of financial reporting. They show that levels of timeliness of loss recognition are significantly lower in private firms than in public firms in the UK despite the high level of similarity in rules controlling the financial reporting of both public and private firms in the UK. They argue that as information asymmetry between managers and other parties is more likely to be resolved by 'insider access' model or private communication in private companies compared to 'arm's length' public disclosure in public companies, the market demand for financial reporting quality differs, and ultimately influences the level of timeliness of loss recognition in these two groups of companies. This means that the properties of financial reporting can be explained by the different demands of different parties in resolving information asymmetry. García Lara et al. (2014) find evidence supporting the beneficial impact of conditional conservatism on the information environment of firms. In particular, they report that firms with high

levels of conservatism exhibit subsequent low degrees of information asymmetry, as measured by having lower bid-ask spread and lower stock return volatility. Moreover, they find that increases in conservatism subsequently lead to increasing (decreasing) the accuracy (dispersion) of analyst forecasts and increasing analyst following.

Accordingly, conservative accounting is argued to be a consequence and mitigator for the adverse effects of information asymmetry between insiders and outsiders in both debt and equity markets (Ball & Shivakumar, 2005; LaFond & Watts, 2008). Consistent with these arguments, several studies provide evidence of the usefulness of conservative accounting in the equity market. For instance, using asset-pricing tests, García Lara et al. (2011) find evidence that conditional conservatism is negatively associated with the cost of equity capital. Using an international dataset, Li (2015) provides evidence that the cost of equity and debt is lower for firms domiciled in countries experiencing higher degrees of conditionally conservative reporting systems. Francis et al. (2013) report that conservative accounting has a positive effect on shareholder value during the financial crisis, and that this effect is more pronounced when firms experience higher levels of asymmetric information and weaker governance structures. Goh et al. (2017) contend that conservatism plays a stronger role in reducing asymmetric information between the firm and its shareholders than that between the firm and its debtholders. They report that the likelihood of choosing equity financing, compared to debt financing, increases in firms having greater degrees of conditional conservatism. They also demonstrate that equity issuers, relative to debt issuers, experience a greater decline in the cost of equity that is related to conservatism. Moreover, they report that the impact of conservatism on the choice of issuing equity is more prominent with increasing asymmetric information between the firm and shareholders.

Furthermore, some studies provide evidence that conservative reporting signals for the lower likelihood of insiders' adverse selection arising from information asymmetry. For example, Kim et al. (2013) show that accounting conservatism alleviates the negative consequences of SEO announcements on stock returns. Specifically, after controlling for corporate governance mechanisms, they find that firms with higher levels of conservatism experience lower negative abnormal returns during the SEO announcements relative to firms with lower levels of conservatism. They contend that conservatism decreases the negative consequences of SEO announcements by reducing the negative effect of information asymmetry. In a similar vein, Kim and Zhang (2016) find that conditionally conservative accounting reduces the likelihood of future stock

crashes supporting that conditionally conservative accounting is beneficial for users in the equity market as it mitigates managers' incentives, tendencies and abilities to withhold bad news. In addition, they find this role of conservatism more pronounced when firms have higher levels of information asymmetry. D'Augusta et al. (2016) also find evidence supporting the usefulness of conditional conservatism for equity market users by reporting a negative impact of conservatism on investor disagreement. They argue that conservatism reduces investor disagreement through: (1) increasing the credibility of earnings and therefore reducing investors' uncertainties about accounting numbers, and (2) its effect on the complete and timely revelation of bad news and, consequently, reducing information asymmetries. They also show that the negative association between conservatism and investor disagreement is stronger (weaker) in firm-periods experiencing bad (good) news.

Hence, prior studies addressing the conservatism's influence on aspects of debt and equity market generally demonstrate the crucial role of conservatism in increasing the credibility of accounting information and reducing the adverse effects of information asymmetries between firm insiders and outsiders including shareholders and debtholders.

Extending prior studies on benefits of conservatism, this study attempts to enhance our understanding of the potential role of conservatism in the market for corporate control. Based on the winner's curse and divergence of opinions between investors, this study predicts that conservative accounting of target firms helps acquiring firms to avoid the winner's curse by offering lower premiums to target shareholders. This can be done through mitigating the negative consequences of uncertainty about the target's true value arising from asymmetric information and divergence of opinions among bidders about this value.

In this study, I argue that the target's conservative accounting may help bidders to accurately estimate the target's true value by first making the target's accounting information more credible. As argued by Watts (2003a), managers tend to overestimate unverifiable future gains but underestimate unverifiable future losses and, consequently, stronger (lower) verification requirements by conservative accounting to recognise unverifiable future gains (losses) makes information that accounting provides on current performance "hard". That is, stronger verification requirements by accounting conservatism for revenues lead to making the reported income reflecting realisations of actual and future cash flows arising only from verifiable predictors, such as accounts receivable with high levels of verification (Ball & Shivakumar, 2005). On the other hand,

less stringent requirements of verifying losses lead to accelerating the recognition of losses and the earlier acknowledgement of negative net present value projects (Basu, 1997; Watts, 2003a).

Conservative accounting may also reduce uncertainty about the target's value by decreasing potential adverse selection by the target's managers resulting from asymmetric information between the target's managers and bidders. Managers are more likely to have incentives to underestimate less unverifiable losses and hoard bad news but overestimate and disclose good news (Watts, 2006). Asymmetric verification requirements for gains and losses of conservative accounting offset managers' incentives and abilities by eliciting information about potential losses that would arguably be reliable and allowing the recognition of only verifiable gains in financial statements (Watts, 2006; LaFond & Watts, 2008). Therefore, conditional conservatism helps reduce adverse selection problems arising from information asymmetry between managers and outsiders by mitigating managers' opportunistic incentives to overstate earnings and net assets and constraints their abilities to hide bad information (Watts, 2003a; D'Augusta et al., 2016; Kim & Zhang, 2016). Consistent with this argument, LaFond and Watts (2008) and Khan and Watts (2009) find that information asymmetry between insiders and outsiders generates demand for accounting conservatism, signifying the conservatism's role in reducing the adverse consequences of information asymmetry. Further, prior studies provide strong evidence that supports the beneficial role of conditional conservatism in mitigating adverse selection problems between managers and outside users in the equity market (e.g., Francis et al., 2013; Kim et al., 2013; Kim & Zhang, 2016).[30]

Moreover, conservative accounting of target firms is expected to play a role in disciplining other sources of information, which in turn may reduce the divergence of opinions among acquiring firms and help them to value the target firm more accurately. That is, it is argued that "hard" information provided by conservative accounting can play a disciplining role for sources of "soft" information, such as management and financial analysts, by serving a credible benchmark for such "soft" information sources (Watts, 2006; LaFond & Watts, 2008). Accounting conservatism makes financial statements

[30] Some studies also provide analytical evidence that conditional conservatism decreases earnings management. For instance, Chen et al. (2007) show that conditionally conservative accounting can restrict managers' incentives to manipulate earnings. Also, Gao (2013) find that conditional conservatism plays a role in constraining the ex post opportunism of managers. Empirically, García Lara et al. (2012) report that conditional conservatism is negatively associated with measures of accruals-based earnings management and positively associated with measures of real earnings management. However, they find that conditional conservatism generally seems to have more benefits, than costs, on the quality of financial statements.

reflecting verifiable net assets and cash flows realisations of current and future periods and constrains managers' ability to overstate firms' resources (net assets) or earnings. This verifiability of conservative accounting information makes financial statements a credible source of the performance of growth opportunities and investments undertaken in the past. In addition, by using "hard" information provided by conservative accounting, investors can assess the accuracy and reliability of predictions provided by different "soft" information sources. Therefore, using verifiable numbers allows other sources of information to exist, be disciplined, have a reputation and credibility, and have a role in reducing information asymmetry.

Empirical evidence supports the disciplining role of accounting conservatism for other sources of "soft" information. For instance, prior studies address the impact of conservatism on voluntary disclosure by management and the market reaction to this disclosure. Hui et al. (2009) find that conservatism is negatively related to the frequency of management forecasts. They interpret this as conservatism plays a substitution role for management forecasts by reducing information asymmetry and managers' exposure risk for litigation that might result from hoarding bad news. D'Augusta and DeAngelis (Forthcoming) demonstrate that accounting conservatism has a disciplining role for managers' voluntary disclosure in the Management Discussion and Analysis (MD&A) section of the annual report. In particular, they provide evidence that accounting conservatism is negatively associated with upward tone management, suggesting that conservatism constrains managers' incentives to manipulate voluntary disclosure. They also find that this role of conservatism is more prominent when managers' incentives for upward tone management is higher. Moreover, they do not find evidence that conservatism increases downward management tone. D'Augusta (2018) shows that accounting conservatism corrects for the initial market underreaction (overreaction) and subsequent market correction to good (bad) news forecasts, suggesting that conservatism moderates the effect of management forecasts on the market reaction through enhancing the credibility of forecasts. Specifically, he finds that the initial positive market reaction to positive management forecasts is stronger while the subsequent market positive drift is lower when firms have higher levels of conservatism. Also, he finds that the initial negative market response to negative management forecasts is lower, the subsequent positive correction is lower, and the increase in uncertainty among investors is lower when firms have higher levels of conservatism.

As conservatism makes accounting information in financial statements more credible, mitigates probable adverse selection by insiders, and disciplines other sources of information (Ball & Shivakumar, 2005; Watts, 2006; LaFond & Watts, 2008), this study predicts that conservative reporting of target firms increases the credibility of accounting information available to bidders in the takeover market and, consequently, help bidders to accurately estimate the true value of targets and avoid overpayment to target shareholders. Based on the argument above, I formulate the first hypothesis as follows:

> **Hypothesis 1:** The takeover premium offered by the winning acquirer to target shareholders decreases when the target's conservative accounting increases

The winner's curse states that when bidders compete over an asset with uncertain value, they vary in their estimations about the true value of this asset, and the bidder who wins the contest is typically the one who most excessively overestimates this value (e.g., Bazerman & Samuelson, 1983). The incidence and magnitude of the winner's curse are found to increase when uncertainty about the true value of the asset bidding over increases. For instance, Varaiya (1988) provides evidence that the divergence of opinions between bidders over the true value of the target and the competition between bidders increase the magnitude of the winner's curse. McNichols and Stubben (2015) show that acquirer announcement returns are negatively associated with uncertainty over the target's value, suggesting that uncertainty increases the variation between bidders in estimating the true value of the target and ultimately makes the winning bid higher (i.e., the winner's curse). Brander and Egan (2017) provide evidence of the existence of the winner's curse in M&A deals of privately-held companies and that the probability of its existence increases with the increase in asymmetric information.

Accordingly, as the incidence and magnitude of the winner's curse and the divergence of opinions amongst bidders over the target's value increase with increasing uncertainty about the true value of the target, this study predicts a stronger negative relation between the target's conservative accounting and the takeover premium when uncertainty about the target's value is higher. As discussed earlier, conservative accounting would mitigate the adverse consequences of uncertainty about the true value of the target firm. This uncertainty could arise from business-specific uncertainties or asymmetric information between target firm insiders and outsiders. Conservative

accounting increases the credibility of accounting information through its asymmetric verification requirements for gains and losses (LaFond & Watts, 2008). Conservative accounting also reduces managers' incentives, tendencies, and abilities to withdraw bad news and, therefore, decreases the likelihood of adverse selection by managers (e.g., Watts, 2006; Kim & Zhang, 2016). Moreover, conservatism has a disciplinary role for other sources of information, i.e., soft information sources. Consequently, increasing the credibility of accounting information and decreasing the probability of adverse selection would help bidders to accurately value the target, decrease their divergence of opinions over the target's value and, thus, avoid any potential overpayment, particularly when there is high uncertainty about the target's true value. Stated formally, the second hypothesis is:

> **Hypothesis 2:** The negative association between the target's conservative accounting and the takeover premium is more pronounced when uncertainty about the target's value is higher.

4.4 Research design

Following Nikolaev (2010) and Kravet (2014), this study uses a two-stage approach in testing hypotheses in order to control for the effects of confounding variables and avoid multicollinearity problems and, therefore, get clean results. In the first stage, the measure of the takeover premium is regressed on a vector of variables that might be correlated with the takeover premium and, therefore, might confound the effect of the target's accounting conservatism on the takeover premium. Residuals obtained from the first stage regression (i.e., the unexplained part of the takeover premium) are saved and, then, interacted with the conservatism measure in the second stage to examine the association between the target's conservative accounting and the takeover premium.

4.4.1 Controlling for confounding effects: The first stage

In the first stage, the measure of the takeover premium is regressed on several control variables that might confound the effect of conservatism on premium. These variables could be categorised into three groups: target characteristics, acquirer characteristics, and deal characteristics. Specifically, the following cross-section ordinary least square (OLS) regression model is used:

$$
\begin{aligned}
Premium_{i,t} = {} & \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} \\
& + \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Acq\_Size_{i,t-1} + \alpha_6 Acq\_MTB_{i,t-1} \\
& + \alpha_7 Acq\_Lev_{i,t-1} + \alpha_8 Acq\_ROE_{i,t-1} + \alpha_9 Tender_{i,t} \\
& + \alpha_{10} Competition_{i,t} + \alpha_{11} Hostile_{i,t} + \alpha_{12} Cash_{i,t} \\
& + \alpha_{13} Stock_{i,t} + \alpha_{14} SameInd_{i,t} + \mu_n \, Year\ dummies \\
& + \lambda_n \, Industry\ dummies + \varepsilon_{i,t}
\end{aligned} \tag{1}
$$

where *t* is the deal announcement year, *t-1* is the latest fiscal year ended prior to the deal announcement date for both the target and acquirer, and *i* is the deal or the target/acquiring firm.[31] $Premium_{i,t}$ is the takeover premium offered by the acquirer to the target. Similar to Boone and Mulherin (2007) and Skaife and Wangerin (2013), the takeover premium, $Premium_{i,t}$, is defined as the ratio of the price offered by the acquirer to target shareholders relative to the target's share price four calendar weeks prior to the deal announcement date, as calculated by Thomson Reuters Eikon, minus one.

In the first-stage regression, residuals are orthogonalised from several explanatory/control variables that might be associated with the takeover premium. This study follows prior studies in determining variables that possibly determine the takeover premium (e.g., Walkling & Edmister, 1985; Bradley et al., 1988; Schwert, 2000; Eckbo, 2009; Alexandridis et al., 2013; Raman et al., 2013; Skaife & Wangerin, 2013; Offenberg & Pirinsky, 2015; Dhaliwal et al., 2016). First, several variables are included to control for target firm-specific operating and financial risks that might be correlated with the deal premium, as well as the target's accounting conservatism. These variables include the target's size, market to book ratio, leverage, and return on equity. The target's size, *Tar_Size*, is defined as the natural logarithm of the target's market capitalisation. Market to book, *Tar_MTB*, is the ratio of the target's market value of equity to its book value of equity. Leverage, *Tar_Lev*, is the ratio of the target's total debt to its total assets. Return on equity, *Tar_ROE*, is the ratio of the target's income before extraordinary items to its book value of equity. *Tar_Size*, *Tar_MTB*, *Tar_Lev* and *Tar_ROE* are all measured at the end of the target's fiscal year prior to the deal announcement date.

[31] To include a deal in the sample and to ensure the accuracy of analyses, the difference between the deal announcement year and the latest fiscal year ended prior to the deal announcement date with available data for measuring variables is required to not exceed two years. For instance, if the deal announcement year is 2005, the latest fiscal year ended prior to the deal announcement date must not be before 2003.

Prior studies also show that acquirer characteristics influence the takeover premium offered by the acquirer to target shareholders as well as shareholders abnormal announcement returns (e.g., Moeller et al., 2004; Eckbo, 2009). Thus, this study includes *Acq_Size*, *Acq_MTB*, *Acq_Lev*, and *Acq_ROE* to control for the acquirer's size, market to book, leverage, and return on equity, respectively. These variables are measured at the end of the acquirer's latest fiscal year ended prior to the deal announcement date and in the same way as they are measured for target firms.

Furthermore, this study controls for several deal characteristics that are found to influence the takeover premium. Schwert (2000) demonstrates that acquirers offer higher premiums in hostile deals. Therefore, this study controls for the deal attitude, i.e., whether the deal is friendly (i.e., negotiated) or hostile (i.e., non-negotiated) by including an indicator variable, *Hostile*, that equals one when the deal is classified by Thomson Reuters Eikon as a hostile or unsolicited, and zero otherwise. Prior studies also show that the existence of multiple contesting bidders in a deal (i.e., auction) significantly increase the premium paid by the successful bidder to the target (e.g., Walkling & Edmister, 1985; Bradley et al., 1988). This study, consequently, controls for whether the deal involves competing bidders by incorporating an indicator variable, *Competition*, that equals one if more than one bidder is involved in the deal, and zero otherwise. This study expects a positive effect for both hostile and competition on the takeover premium. Tender offers, i.e., the acquirer directly approaches target shareholders, are perceived as high demand for targets' shares. Consistent with this expectation, Offenberg and Pirinsky (2015) show that structuring the deal in the form of a tender offer is associated with paying higher premiums by acquirers. Therefore, an indicator variable, *Tender*, is included that equals one when the deal form is classified as a tender, and zero otherwise.

Although the literature demonstrates that using stock in paying consideration has negative consequences on the acquirer's announcement returns, Ayers et al. (2003) find a premium-discount in stock-financed acquisitions because of the advantage of the tax capital gains for the target's shareholders in these tax-free acquisitions. Therefore, two indicator variables are incorporated to control for whether the deal is mostly financed using cash or stock: *Cash* that equals one if 90% or more of the deal consideration is paid using cash, and zero otherwise, and *Stock* that equals one if 90% or more of the deal consideration is paid using the acquirer's stock, and zero otherwise. As Walkling and Edmister (1985) show that premiums are higher in non-conglomerate deals, the indicator variable *SameInd* is used to control for whether both the target and the acquirer belong to

the same two-digit SIC industry. It is equal to one if both the target and the acquirer belong to the same industry, and zero otherwise. Finally, year fixed effects and the target's industry fixed effects based on the Fama and French (1997) 48 industry classification are used to control for changes in the takeover activity over the years and across industries.

4.4.2 Measuring conservative accounting

Basu (1997) measure is used as the primary measure for the target's conservative accounting. Basu (1997) measure is the most popular measure of accounting conservatism that has been widely used in the literature. Basu (1997) builds his measure of conservatism based on a "reverse version" of Beaver et al. (1980) regression model whereby the independent variable is returns (leading variable), and the dependent variable is earnings (lagging variable). Therefore, his model is in line with studies suggesting that market prices lead earnings; that is, prices are determined by information provided by sources other than contemporaneous earnings (e.g., Ball & Brown, 1968; Beaver et al., 1980). He operationalises conservatism by depending on the notion of its impact on earnings' quicker reflection of bad news (such as unrealised losses) than good news (such as unrealised gains) and the use of negative and positive stock returns to proxy for bad and good news, respectively.

This study uses two versions of Basu (1997) measure. The first version is based on the original Basu earnings-based measure. Specifically, to capture the target's pre-merger commitment of using conservative accounting, this study estimates the following Basu (1997) piece-wise model for target firms over a pooled cross-section time-series window of five years ending at the target's fiscal year-end prior to the acquisition date:

$$Earn_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z} \quad (2)$$

where t represents the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. $Earn_{i,t-z}/MV_{i,t-z-1}$ is the target's net income before extraordinary items (Compustat item: *ib*) deflated by the lagged market value of equity (Compustat items: *prcc_f* csho*); $Ret_{i,t-z}$ is the target's market-adjusted annual stock return computed by compounding monthly market-adjusted returns, including

dividends, over the fiscal year (CRSP monthly stock file items: *ret* adjusted by the value-weighted market return, *vwretd*). And $Dum_{i,t-z}$ is an indicator variable that equals one if $Ret_{i,t-z}$ is negative, and zero otherwise.

Basu (1997) uses a dummy variable for stock returns, $Dum_{i,t-z}$, to allow both the intercept and coefficients to vary across positive (or non-negative) and negative returns. Therefore, β_2 is a measure of earnings' timeliness for good news and the coefficient of the interaction between $Ret_{i,t-z}$ and $Dum_{i,t-z}$, β_3, is the main measure of conservatism, i.e., earnings' incremental timeliness to bad news (i.e., negative returns) relative to good news (i.e., non-negative) returns. According to conservative accounting, in periods of bad news (i.e., negative returns), it is expected that the coefficient of the interaction between returns and the dummy variable of negative returns, β_3, to be positive. Therefore, higher values of β_3 reflects higher degrees of conservatism.

The second version of Basu measure is based on the use of accruals rather than earnings in the original Basu measure. Collins et al. (2014) demonstrate that the inclusion of asymmetric timeliness of cash flows from operation (CFO) is a main source of bias or noise in measuring conditional accounting conservatism. That is, CFO asymmetry does not reflect the asymmetric verification requirements imposed by conservative accounting practices. Rather, they provide evidence of the systematic variation of CFO with firm characteristics reflecting its life-cycle stage. They show that many biases attributed to the earnings-based Basu differential timeliness (DT) measure (Givoly et al., 2007; Patatoukas & Thomas, 2011; Ball et al., 2013) are eliminated when removing CFO from earnings. They support their findings by showing that, as the agency/contracting theory predicts, there is a cross-section variation in the accruals-based measure of conservatism with the variation in leverage, size and MTB ratios (e.g., Ahmed et al., 2002; Watts, 2003a; Roychowdhury & Watts, 2007; Khan & Watts, 2009). Thus, they recommend removing CFO from earnings and only using accruals in measures of conditional conservatism to rule out the effect of omitted correlated variables mainly incorporated in cash flow asymmetry.

Therefore, this study uses the following Basu (1997) asymmetric timeliness measure for target firms based on accruals, rather than earnings, consistent with Collins et al. (2014):

$$Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z} \quad (3)$$

where $Acc_{i,t-z}/MV_{i,t-z-1}$ is the target's operating accruals as calculated by net income before extraordinary items (Compustat item: ib) minus cash flows from continuing operations (Compustat item: [oancf – xidoc]) as reported in the statement of cash flows, deflated by lagged market value of equity (Compustat items: prcc_f * csho). Variable definitions are reported in Table 4.1.

4.4.3 Empirical model: The second stage

To test the relation between the target's pre-merger conservative accounting and the takeover premium, the measure of the takeover premium is interacted with all explanatory variables of Basu (1997) measure as follows:

$$\begin{aligned} Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} &= \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\ &+ \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{i.t} * Dum_{i,t-z} + \beta_6 r\_Prem_{i.t} \\ &* Ret_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} + \varepsilon_{i,t-z} \end{aligned} \quad (4)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. Based on Basu (1997), the coefficient of the interaction between annual returns and the dummy variable of negative annual returns, β_3, reflects the asymmetric timeliness of economic gains versus losses, i.e., conservative accounting, and is expected to be positive. $r\_Prem_{i,t}$ represents residuals obtained from estimating Eq. (1) regressing $Premium_{i,t}$ on several control variables that might confound the effect of the target's conservatism on the takeover premium (the first stage regression). The interaction term $r\_Prem_{i,t} * Dum_{i,t-z} * Ret_{i,t-z}$ tests the association between the target's conservative accounting and the takeover premium. Thus, β_7 is the coefficient of the primary interest. As this study hypothesises that conservative accounting of target firms helps bidders to bid more effectively and avoid overpayment, β_7 is expected to be negative. This study offers no predictions for other coefficients including β_0, β_1, β_2, β_4, β_5, and β_6.

Eq. (4) is estimated using a pooled cross-section time-series regression and using the target's data for earnings and returns over a window of five years ending at the latest fiscal year-end prior to the acquisition date. Specifically, for each target-firm with a successful acquisition announced during year *t*, this study includes net income before extraordinary items (or operating accruals), deflated by lagged market value, and market-adjusted annual stock return for five fiscal years from *t-1* to *t-5*.

It is worth noting that the value of the takeover premium (i.e., residuals obtained from the first-stage regression) is constant over the five-year window for each target-firm but differs cross-sectionally. Both net income before extraordinary items (or operating accruals), deflated by lagged market value, and market-adjusted annual stock return ($Earn_{i,t-z}/MV_{i,t-z-1}$, $Acc_{i,t-z}/MV_{i,t-z-1}$ and $Ret_{i,t-z}$) are winsorised at the 1% and 99% to minimise the effect of outliers. Standard errors of the parameter estimates are clustered by year and target-firm to correct for heteroskedasticity as well as time-series and cross-section correlations (Petersen, 2009).

The second hypothesis predicts that the negative association between a target's conservative accounting and takeover premium to be stronger when targets have higher levels of asymmetric information. To test this hypothesis, the full sample is split into two subsamples based on the level of the target's pre-merger asymmetric information and then Eq. (4) is re-estimated using these two sub-samples. Two proxies for the target's pre-merger asymmetric information are used: the target's stock return volatility, *Tar_Vol*, and bid-ask spread, *Tar_BidAsk*. The target's stock return volatility is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. The target's bid-ask spread is estimated as the target's daily spread between CRSP bid (low) and ask (high) scaled by the spread midpoint, averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64). Targets are classified as with high (low) ex ante asymmetric information if *Tar_Vol* or *Tar_BidAsk* is greater than (lower than or equal to) the sample median. If the target's conservative accounting helps bidders to bid more effectively and avoid overpayment resulting from the high information uncertainty of the target firm, it is expected that the negative relation between the target's conservative accounting and the takeover premium to be stronger in the high ex ante information asymmetry subsample.

Table 4.1
Variable definitions

Variable	Definition	Data source
a) Premiums and residuals		
Premium	The ratio of the share price offered by the acquirer to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one	Thomson Reuters (TR) Eikon
r_Prem	The unexplained part (residual) of the takeover premium obtained from the first-stage regression using *Premium*	
b) Basu (1997) measure of conservatism		
Ret	The target's market-adjusted annual stock return computed by compounding monthly market-adjusted returns, including dividends, over the fiscal year (CRSP monthly stock file items: *ret* adjusted by the value-weighted market return, *vwretd*)	CRSP monthly stock file
Earn	The target's net income before extraordinary and exceptional items (Compustat item: *ib*)	Compustat
Acc	The target's operating accruals, calculated as earnings before extraordinary and exceptional items (Compustat item: ib) minus cash flows from continuing operations (Compustat items: [oancf – xidoc])	Compustat
MV	The target's market value of equity (Compustat items: *prcc_f* * *csho*)	Compustat
Dum	An indicator variable that equals one if the target's market-adjusted annual stock return, *Ret*, is negative, and zero otherwise	CRSP monthly stock file
c) Target characteristics		
Tar_Size	The natural logarithm of the target's market capitalisation at the end of the fiscal year prior to the deal announcement date [prcc_f*csho]	*Compustat*
Tar_MTB	The ratio of the target's market value of equity to book value of equity at the end of the fiscal year prior to the deal announcement date [(prcc_f*csho)/ceq]	Compustat
Tar_Lev	The ratio of the target's long-term debt and short-term debt to total assets at the end of the fiscal year prior to the deal announcement date [(dltt+dlc)/at]	Compustat
Tar_ROE	The ratio of the target's income before extraordinary items to its book value of equity at the end of the fiscal year prior to the deal announcement date [ib/ceq]	Compustat
Tar_Vol	The target's idiosyncratic stock return volatility that is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. A minimum of 100	CRSP (Daily Stock File)

	available daily stock returns data is required for estimating the market model.	
Tar_BidAsk	The target's bid-ask spread that is estimated as the daily spread between CRSP bid (low) and ask (high) scaled by the spread midpoint [(askhi + bidlo)/2], averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64)	CRSP (Daily Stock File)
d) Acquirer characteristics		
Acq_Size	The natural logarithm of the acquirer's market capitalisation at the end of the fiscal year prior to the deal announcement date [prcc_f*csho]	Compustat
Acq_MTB	The ratio of the acquirer's market value of equity to its book value of equity at the end of the fiscal year prior to the deal announcement date [(prcc_f*csho)/ceq]	Compustat
Acq_Lev	The ratio of the acquirer's long-term debt and short-term debt to total assets at the end of the fiscal year prior to the deal announcement date [(dltt+dlc)/at]	Compustat
Acq_ROE	The ratio of the acquirer's income before extraordinary items to book value of equity at the end of the fiscal year prior to the deal announcement date [ib/ceq]	Compustat
e) Deal Characteristics		
Hostile	An indicator variable that equals one if the deal is classified by TR Eikon as a hostile or unsolicited, and zero otherwise	TR Eikon
Competition	An indicator variable that equals one if two or more bidders are involved in the deal, and zero otherwise	TR Eikon
Tender	An indicator variable that equals one if the deal is classified by TR Eikon as a tender, and zero otherwise	TR Eikon
Cash	An indicator variable that equals one if 90% or more of the deal consideration is paid using cash, and zero otherwise	TR Eikon
Stock	An indicator variable that equals one if 90% or more of the deal consideration is paid using the acquirer's shares, and zero otherwise	TR Eikon
SameInd	An indicator variable that equals one if both the target and the acquirer belong to the same two-digit SIC industry classification, and zero otherwise	TR Eikon

4.5 Data and sample

This study uses a sample of M&A deals between U.S. companies announced during the period ranging from the beginning of 1986 to the end of 2017. Thomson Reuters Eikon database (Deal Screener) is used in collecting M&A deals data. Data on M&A deals in Thomson Reuters Eikon database is augmented by data collected from Thomson One database. Data on M&A deals is then merged with accounting data collected from Compustat and market data obtained from the Centre for Research in Security Prices (CRSP) for both target and acquiring firms.

This study starts the sample from 1986 because the number of deals with available data required for the study is very limited before 1986.[32] I begin with all completed or successful deals between U.S. publicly listed companies so that I can collect accounting and market data required to estimate conservatism measures and control variables. In line with Dionne et al. (2015) and Martin and Shalev (2017), this study expects that the role of a target's conservative accounting in helping acquirers in determining a better price for targets will be more pronounced when acquirers do not have access to targets' private information prior to the deal announcement date. Therefore, as owning the target's shares prior to the deal announcement date possibly provides the acquirer with a privilege to the target's private information, the sample is restricted to deals involving acquirers who do not own any of targets' shares prior to the deal announcement date (i.e. with no toehold) and end up with owning at least 90% of targets' shares at the deal completion date. This study further requires the deal value to be equal to or greater than $1 million to ensure its economic impact for the acquirer and the number of days between the deal announcement and completion dates not to exceed 1,000 days (e.g., Moeller et al., 2004; McNichols & Stubben, 2015). Deals with missing data for the SDC premium four weeks prior to the deal announcement date and those in which either the target or the acquirer does not have available data on Compustat or CRSP required for estimations are also excluded.

Following Khan and Watts (2009), when estimating Basu (1997) measure, firm-years with a negative book value of equity or with a share price at the fiscal year-end less than $1 are also excluded. As conservatism is estimated over the five-year window prior to the deal announcement date, available data for the target for at least two years is

[32] This study restricts the sample period to start from 1993 till 2017 when it uses the accruals-based Basu measure (and Ball and Shivakumar (2005) measure in the robustness checks). That is, it requires having cash flow data for five years prior to the deal announcement date retrieved directly from the statement of cash flows that has become available since 1988, consistent with Hribar and Collins (2002).

required to include the deal in analyses. These requirements yield a final sample consisting of 1,434 deals, corresponding to 6,168 firm-year observations. Panel A of Table 4.2 summarises the procedures of the sample selection.

Panel B of Table 4.2 presents the distribution of M&A deals according to the deal announcement year. Consistent with prior studies (e.g., Moeller et al., 2004; Masulis et al., 2007; Francis & Martin, 2010; Kravet, 2014; Chen et al., 2018a), the number of deals increases almost steadily over the period 1986-1999 until it starts to drop concurrently with the dot-com crash in 2000. Years 1998 and 1999 show the highest frequency with no year exceeds 7.5% of all deals in the sample period. The number of deals starts to increase again starting from 2003, probably after the reporting scrutiny and transparency imposed by the Sarbanes-Oxley (SOX) Act of 2002. The number of deals experiences another drop coinciding with the global financial crisis in 2008.

Panel C of Table 4.2 presents the frequency distribution of M&A deals by the target's industry according to the Fama-French 48 industry classification. Generally, the distribution shows that deals are widely spread across industries. Banking, business services and trading industries show the highest representation in the sample by 23.29%, 12.41%, and 10.11%, respectively.

Table 4.2
Sample selection and distribution

Panel A: Sample selection process

	No. of deals
Completed M&A deals between the U.S. publicly listed companies announced between 1/1/1986 and 31/12/ 2017	14,413
Less	
Deals with acquirers owning any of targets' shares at the deal announcement date	(973)
Deals with acquirers ending up with less than 90% of targets' shares at the deal completion date	(6,736)
Deals with value < $1 million	(543)
Deals with missing data to measure the takeover premium, the earnings-based Basu (1997) conservatism and control variables.	(4,727)
Final sample:	
Number of deals	1,434
Number of firm-year observations	6,168

Panel B: Sample distribution by announcement year

Year	N	%	Year	N	%
1986	13	0.91	2002	44	3.07
1987	16	1.12	2003	66	4.60
1988	16	1.12	2004	70	4.88
1989	14	0.98	2005	53	3.70
1990	13	0.91	2006	55	3.84
1991	14	0.98	2007	60	4.18
1992	6	0.42	2008	37	2.58
1993	11	0.77	2009	31	2.16
1994	10	0.70	2010	49	3.42
1995	45	3.14	2011	27	1.88
1996	58	4.04	2012	42	2.93
1997	87	6.07	2013	43	3.00
1998	98	6.83	2014	47	3.28
1999	105	7.32	2015	55	3.84
2000	87	6.07	2016	54	3.77
2001	75	5.23	2017	33	2.30
			Total	1,434	100

Panel C: Sample distribution by the target's Fama-French 48 industry classification

	N	%		N	%
Agriculture	2	0.14	Defense	1	0.07
Food Products	15	1.05	Precious Metals	2	0.14
Candy & Soda	1	0.07	Non-Metallic and Industrial Metal Mining	3	0.21
Beer & Liquor	1	0.07	Coal	1	0.07
Recreation	6	0.42	Petroleum and Natural Gas	31	2.16
Entertainment	10	0.70	Utilities	30	2.09
Printing and Publishing	7	0.49	Communication	18	1.26
Consumer Goods	13	0.91	Personal Services	11	0.77
Apparel	5	0.35	Business Services	178	12.41
Healthcare	25	1.74	Computers	41	2.86
Medical Equipment	43	3.00	Electronic Equipment	82	5.72
Pharmaceutical Products	62	4.32	Measuring and Control Equipment	35	2.44
Chemicals	16	1.12	Business Supplies	14	0.98
Rubber and Plastic Products	16	1.12	Shipping Containers	3	0.21
Textiles	3	0.21	Transportation	22	1.53
Construction Materials	18	1.26	Wholesale	41	2.86
Construction	6	0.42	Retail	33	2.30
Steel Works Etc	11	0.77	Restaurants, Hotels, Motels	7	0.49
Fabricated Products	4	0.28	Banking	334	23.29
Machinery	36	2.51	Insurance	26	1.81
Electrical Equipment	33	2.30	Real Estate	8	0.56
Automobiles and Trucks	7	0.49	Trading	145	10.11
Aircraft	5	0.35	Almost Nothing	22	1.53
Shipbuilding, Railroad Equipment	1	0.07			
			Total	1,434	100

This table presents the sample selection and distribution. Panel A summarises the steps and criteria followed in selecting the final M&A sample. Data about M&A deals is collected from Thomson Reuters Eikon and Thomson one databases and then merged with financial and stock market data extracted from Compustat and CRSP databases, respectively. This study starts with 14,413 completed M&A deals between the U.S. publicly listed companies announced between 1986 and 2017 and end with 1,434 deals that meet all requirements and have available data for all variables required for testing hypotheses. Panel B shows the number of deals and the percentage of deals to the total number of deals in the sample announced each year over the period 1986-2017. Panel C shows the frequency distribution of deals by the target's industry as classified by Fama-French 48 industry classification.

4.6 Descriptive statistics

Table 4.3 presents descriptive statistics for the main variables in the study and correlation coefficients between them. Summary statistics in Panel A of Table 4.3 show that the average takeover premium acquirers offer to target shareholders, *Premium*, equals 41%. This suggests that acquirers in successful deals offer a high positive premium to target shareholders and it is consistent with the magnitude of the takeover premium reported in prior studies (e.g., Eckbo, 2009; Raman et al., 2013; Dhaliwal et al., 2016). The median of the target (acquirer) size equals \$199 (\$2,079) million. Target firms appear to have low leverage levels, on average. The mean (median) leverage for target firms is 19% (14%) approximately. These figures are generally comparable to those reported by Chen et al. (2018a). Statistics also show that the average market value for target firms at the fiscal year-end prior to the deal announcement date is greater than the double of the book value. The mean and median market to book ratio is 2.51 and 1.75, respectively. However, both the mean and median of the market to book ratio for acquirers (3.16 and 2.22, respectively) are relatively higher than those of targets. In addition, the mean and median of the profitability ratio, ROE, of acquirers are greater than those for targets (11.4% and 12.4% compared to -0.3% and 8.3%). This might provide some indication for acquirers' better performance prior to engaging in M&A transactions that could be consistent with the hubris hypothesis of Roll (1986). As for the target's asymmetric information, the mean and median of the target's ex ante stock return volatility equal 2.9% and 2.4%, respectively, which are comparable to those in Cheng et al. (2016) (mean and median of volatility are 3% and 2.7%) but smaller than those reported by McNichols and Stubben (2015) (median and mean are 4% and 3% respectively). As for the target's ex ante bid-ask spread, the mean and median for the sample are 3.9% and 3.2%, respectively. They are also close to those reported by Cheng et al. (2016) (mean and median are 3.7% and 3%, respectively).

Statistics of the deal characteristics are consistent with prior literature (e.g., McNichols & Stubben, 2015; Chen et al., 2018a). Tender offers represent 16.7% of the full sample. About 5% of deals involve competition by having more than one bidder contesting for acquiring the target. Only about 1% of deals in the sample are classified as hostile or unsolicited. With respect to the method of payment, only-cash deals represent about 32% of all deals, only-stock deals represent about 36%, and the remainder (32%) are classified as a mix of cash and stock. About 70% of all deals are deals between companies that belong to the same two-digit SIC industry classification, i.e., intra-industry acquisitions.

As for the sample of firm-year observations, about 53% of observations have bad news as measured by negative adjusted-market stock returns. The mean (median) of earnings scaled by lagged market value equals 0.030 (.055). As expected, the mean value of the measure of unexplained premium, i.e., *r_Prem*, is zero as they represent the residuals obtained from the first-stage regression.

Table 4.3
Descriptive statistics and correlations

Panel A: Descriptive statistics

variable	N	Mean	sd	Min	p25	Median	p75	Max
Premium	1,434	0.411	0.323	-0.225	0.198	0.345	0.565	1.516
Tar_Size ($M)	1,434	1,031	2,610	6	64	199	729	19372
Tar_MTB	1,434	2.506	2.725	0.359	1.192	1.751	2.613	18.549
Tar_Lev	1,434	0.188	0.181	0.000	0.032	0.142	0.298	0.746
Tar_ROE	1,434	-0.003	0.352	-2.073	0.007	0.083	0.133	0.518
Tar_InfAsym (Vol)	1,434	0.029	0.017	0.008	0.017	0.024	0.036	0.089
Tar_InfAsym (BidAsk)	1,434	0.039	0.022	0.011	0.023	0.032	0.049	0.114
Acq_Size ($M)	1,434	14,662	35,640	32	585	2,079	9,151	196,577
Acq_MTB	1,434	3.162	2.795	0.503	1.564	2.222	3.647	16.473
Acq_Lev	1,434	0.202	0.161	0.000	0.081	0.176	0.286	0.753
Acq_ROE	1,434	0.114	0.176	-0.816	0.078	0.124	0.176	0.783
Tender	1,434	0.167	0.373	0.000	0.000	0.000	0.000	1.000
Competition	1,434	0.047	0.213	0.000	0.000	0.000	0.000	1.000
Hostile	1,434	0.008	0.091	0.000	0.000	0.000	0.000	1.000
Cash	1,434	0.316	0.465	0.000	0.000	0.000	1.000	1.000
Stock	1,434	0.361	0.481	0.000	0.000	0.000	1.000	1.000
SameInd	1,434	0.702	0.457	0.000	0.000	1.000	1.000	1.000
Earn/lagMV	6,168	0.030	0.128	-0.576	0.008	0.055	0.088	0.330
Acc/lagMV	3,530	-0.076	0.152	-0.816	-0.110	-0.040	-0.007	0.286
Dum	6,168	0.534	0.499	0.000	0.000	1.000	1.000	1.000
Ret	6,168	0.052	0.529	-0.856	-0.260	-0.030	0.249	2.551
r_Prem	6,168	0.000	0.287	-1.002	-0.175	-0.029	0.146	1.082

Table 4.3 (continued)

Panel B: Spearman's rank correlation (upper right) and Pearson's correlation coefficients (lower left)

		1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)
1)	*Premium*		**-0.20**	**-0.06**	**-0.05**	**-0.07**	0.00	**0.10**	**-0.09**	**0.06**	**0.15**	**0.08**	**0.06**	**0.12**	**-0.05**	**-0.09**
2)	*Tar_Size*	**-0.21**		**0.46**	**0.14**	**0.28**	**0.62**	**0.22**	**0.20**	**0.18**	-0.01	**0.07**	**0.09**	-0.03	**-0.08**	**0.05**
3)	*Tar_MTB*	-0.02	**0.29**		-0.02	**0.27**	**0.41**	**0.48**	0.04	**0.21**	0.02	0.02	0.03	0.04	-0.01	**-0.08**
4)	*Tar_Lev*	**-0.06**	**0.14**	**0.10**		**0.10**	0.00	**-0.16**	**0.40**	-0.03	**-0.04**	**0.05**	0.03	**-0.17**	**-0.05**	0.04
5)	*Tar_ROE*	**-0.08**	**0.22**	**-0.16**	-0.04		**0.16**	0.03	**0.09**	**0.25**	**-0.08**	0.00	0.01	**-0.17**	**0.11**	0.00
6)	*Acq_Size*	0.00	**0.63**	**0.24**	0.00	**0.09**		**0.45**	**0.16**	**0.40**	**0.07**	-0.01	**0.06**	**0.20**	**-0.13**	**-0.09**
7)	*Acq_MTB*	**0.12**	**0.19**	**0.31**	**-0.11**	**-0.08**	**0.36**		0.00	**0.49**	**0.06**	-0.02	-0.01	**0.09**	**0.06**	**-0.11**
8)	*Acq_Lev*	**-0.09**	**0.19**	0.00	**0.43**	**0.08**	**0.09**	**0.06**		**0.08**	-0.01	0.04	-0.01	-0.01	**-0.10**	0.00
9)	*Acq_ROE*	0.03	**0.16**	0.03	-0.03	**0.21**	**0.32**	**0.21**	0.02		**0.06**	-0.03	0.02	**0.12**	-0.04	**-0.10**
10)	*Tender*	**0.15**	-0.02	0.04	-0.03	**-0.07**	**0.07**	**0.05**	-0.02	**0.05**		**0.15**	**0.12**	**0.41**	**-0.31**	**-0.12**
11)	*competition*	**0.10**	**0.08**	0.02	0.04	0.03	-0.01	0.01	0.03	-0.03	**0.15**		**0.12**	0.03	**-0.07**	0.02
12)	*Hostile*	**0.06**	**0.10**	0.04	0.03	0.03	**0.06**	0.03	-0.02	0.03	**0.12**	**0.12**		-0.01	-0.02	-0.01
13)	*Cash*	**0.12**	**-0.05**	0.03	**-0.13**	**-0.09**	**0.21**	**0.05**	-0.01	**0.12**	**0.41**	0.03	-0.01		**-0.51**	**-0.19**
14)	*Stock*	**-0.04**	**-0.07**	-0.01	**-0.09**	**0.06**	**-0.13**	0.04	**-0.12**	**-0.06**	**-0.31**	**-0.07**	-0.02	**-0.51**		**0.12**
15)	*SameInd*	**-0.09**	**0.05**	**-0.05**	0.04	-0.01	**-0.10**	**-0.08**	0.02	**-0.08**	**-0.12**	0.02	-0.01	**-0.19**	**0.12**	

Table 4.3 presents descriptive statistics and correlation coefficients. Panel A presents the descriptive statistics for variables used in the main analysis. For ease of interpretation, Panel A reports the descriptive statistics for the raw values (in millions of dollars) for both target size, *Tar_Size*, and acquirer size, *Acq_Size*. All continuous variables, including the measure of the takeover premium (*Premium)* are winsorised at the 1% and 99% levels to mitigate the effect of extreme values. However, to avoid double winsorisation, unexplained part of the takeover premium, as represented in residuals obtained from the first-stage regression, i.e., *r_Prem* is not winsorised. Panel B reports coefficients for Spearman's (above diagonal) and Pearson's (below diagonal) correlations among main variables. Bold coefficients indicate that they are statistically significant at *p*-values less than the 10% level. Variable definitions are provided in Table 4.1.

Panel B of Table 4.3 presents both Spearman's (above diagonal) and Pearson's (below diagonal) correlation coefficients between the main variables in this study. The results show that the target size is significantly and negatively correlated to takeover premium, suggesting that larger targets receive lower premiums. Consistent with prior literature (e.g., Eckbo, 2009), there is a significant and positive correlation between the takeover premium and being the deal classified as a tender. In addition, takeover premiums seem to be higher (lower) in only-cash (only-stock) deals. The results also show a negative and significant correlation between the takeover premium and being the target and acquirer belonging to the same two-digit SIC industry classification, suggesting that acquirers pay less in deals involving targets in the same industry.

4.7 Empirical results

4.7.1 Controlling for confounding effects

The aim of the first-stage regression is to obtain a clean measure for the takeover premium, for which the effect of the confounding variables that might be associated with are removed. Table 4.4 reports the results of the first-stage ordinary least squares (OLS) regression (Eq. 1). Compared to prior studies (e.g., Raman et al., 2013; Skaife & Wangerin, 2013), the explanatory power of this regression is relatively high with R^2 of 19.7%.

As for target characteristics, and as expected, the results show a negative and significant association between target size and the takeover premium. The *t*-statistic is greater than 7. This is consistent with prior studies (e.g., Eckbo, 2009; Alexandridis et al., 2013), suggesting that takeover premiums are lower for larger targets. Alexandridis et al. (2013) argue that acquirers pay less for larger targets due to the high complexity associated with large targets.

Table 4.4
Controlling for confounding effects

$$Prem_{i,t} = \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} + \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Acq\_Size_{i,t-1} + \alpha_6 Acq\_MTB_{i,t-1} + \alpha_7 Acq\_Lev_{i,t-1} + \alpha_8 Acq\_ROE_{i,t-1} + \alpha_9 Tender_{i,t} + \alpha_{10} Competition_{i,t} + \alpha_{11} Hostile_{i,t} + \alpha_{12} Cash_{i,t} + \alpha_{13} Stock_{i,t} + \alpha_{14} SameInd_{i,t} + \mu_n Year\ dummies + \lambda_n Industry\ dummies + \varepsilon_{i,t}$$

Variables	Premium
Intercept	0.785***
	(2.746)
Tar_Size	-0.057***
	(-7.198)
Tar_MTB	-0.002
	(-0.596)
Tar_Lev	0.051
	(0.828)
Tar_ROE	-0.004
	(-0.121)
Acq_Size	0.026***
	(3.721)
Acq_MTB	0.010**
	(2.308)
Acq_Lev	-0.124*
	(-1.900)
Acq_ROE	0.013
	(0.208)
Tender	0.029
	(1.082)
Competition	0.165***
	(3.489)
Hostile	0.217**
	(1.971)
Cash	0.013
	(0.568)
Stock	-0.015
	(-0.690)
SameInd	-0.012
	(-0.599)
Year FE	Included
Industry FE	Included
N	1,434
R-squared	0.197

This table presents the results of the first-stage regression used to orthogonalise the measure of the takeover premium from the effect of confounding variables. The dependent variable is the takeover premium and is estimated as the ratio of the share price offered by the acquirer to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). t-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects and Fama-French 48 industry fixed effects are included in all regressions whose results are supressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

As for acquirer and deal characteristics, the results suggest that larger acquirers pay larger premiums. The coefficient of *Acq_Size* equals 0.026 ($t = 3.721$). This result is consistent with Moeller et al. (2004) findings of the size effect on acquisition profitability to acquirer shareholders. Based on the winner's curse prediction, the winning bidder is more likely to overpay when multiple bidders are competing to get control over the target. Consistent with this prediction, the results show that the coefficient of *Competition* is positive and significant (β = 0.165, t = 3.489), suggesting that acquirers pay larger premiums in deals involving high competition for the target. In addition, the literature suggests that offer premiums are higher in only-cash financed deals and lower in only-stock financed deals. The results are consistent with these predictions, although not statistically significant. Although it is not statistically significant, the results also demonstrate a positive relationship between being the deal classified as a tender offer and the takeover premium, consistent with prior studies (e.g., Offenberg & Pirinsky, 2015).

4.7.2 Target's conservatism and takeover premium

In the second-stage regressions, the measure of the takeover premium (residuals obtained from the first-stage regression) is interacted with the conservatism measure. Table 4.5 presents the results for estimating accounting conservatism of target firms using the earnings- as well as accruals-based Basu (1997) measures (Eqs. (2) and (3), respectively). It also reports the results of examining the first hypothesis of the association between the target's conservative accounting and the takeover premium using Eq. (4).

Column (1) of Table 4.5 presents the results for estimating Eq. (2), representing the earnings-based Basu (1997) conservatism measure, without interacting its variables with the takeover premium. Consistent with Basu (1997), the results show that the coefficient of the interaction term $Dum_{i,t-z} * Ret_{i,t-z}$, β_3, is positive and statistically significant at the 1% level, implying that target firms, on average, report conservatively over the years leading to an acquisition by asymmetrically recognising economic losses and gains. When estimating accounting conservatism using the accruals-based Basu measure in columns (3) and (5), β_3 is also positive and statistically significant, supporting the conservative reporting of target firms.

Column (2) of Table 4.5 reports the results for estimating Eq. (4) using the earnings-based Basu measure of conservatism. The results reveal that the coefficient of *r_Prem*Dum*Ret* is negative (β_7 = - 0.084) and statistically significant at the 5% level

(t = -2.004). Consistent with the predictions of the first hypothesis, the results suggest that the winning acquirer offers a lower premium to target shareholders when the target firm has a higher level of conservative reporting.

Table 4.5, column (4), shows the results when the accruals-based Basu measure is employed. For this measure, and following Hribar and Collins (2002), the direct method in calculating operating accruals is used that depends on the use of cash flows from continuing operations directly retrieved from the statement of cash flows that have become available since 1988.[33] Therefore, as this study estimates the target's conservative accounting using a window of five fiscal years prior to the date of the acquisition announcement, deals with announcement year before 1993 are excluded when using the accruals-based conservatism measure. The results demonstrate that the interaction term of the conservatism measure and the takeover premium holds negative (β_7 = -0.173) and statistically significant at the 1% level (t = -2.921).

In addition, as financial firms and utilities are subject to different regulations and reporting requirements, their accruals may be different from those in other industries. Column (6) of Table 4.5 reports the results of re-estimating Eq. (4) using accruals as the dependent variable and excluding deals involving target firms belonging to financial or utility industries. The results show that β_7 holds negative and statistically significant at the 1% level.

Overall, these results confirm the negative association between the target's conservative accounting and the takeover, implying that acquirers offer lower premiums for target shareholders when the target's accounting is more conservative over the years preceding the acquisition. Thus, the results suggest that conservative accounting of target firms helps acquirers in the takeover market to bid more effectively and reduces the likelihood that the winning acquirer suffers from the overpayment, i.e., the winner's curse.

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[33] Hribar and Collins (2002) demonstrate that the measure of accruals based on changes in working capital accounts of the balance sheet might lead to spurious inferences for tests use accruals. They find that non-operating events such as mergers and acquisitions, divestitures, foreign currency translations bias estimates of accruals. They argue that these events influence current assets and liabilities accounts in balance sheet without affecting earnings. Therefore, the change in working capital accounts that is used to measure balance sheet accruals might be confounded by the effect of non-operating events on these accounts. They recommend measuring accruals by subtracting operating cash flows directly taken from the statement of cash flows, which according to SFAS 95, has become available since 1988, from earnings before extraordinary items and discontinued operations. Alternatively, researchers can measure accruals by following a comparable method to the balance sheet approach using changes in working capital assets directly from cash flow statements.

Table 4.5
Target's conservatism and takeover premium (H_1)

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{i.t} * Dum_{i,t-z} + \beta_6 r\_Prem_{i.t} * Ret_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} + \varepsilon_{i,t-z}$$

Coeff.	Variables	Y= Earnings		Y= Accruals			
		(1)	(2)	(3)	(4)	(5)	(6)
β_0	*Intercept*	0.061***	0.061***	-0.070***	-0.070***	-0.064***	-0.064***
		(19.328)	(19.604)	(-13.397)	(-13.631)	(-12.416)	(-12.632)
β_1	*Dum*	0.000	0.000	0.006	0.007	-0.001	-0.000
		(0.086)	(0.078)	(0.810)	(0.953)	(-0.120)	(-0.045)
β_2	*Ret*	0.003	0.002	-0.031***	-0.030***	-0.028***	-0.027***
		(0.340)	(0.325)	(-2.908)	(-2.873)	(-3.006)	(-2.988)
β_3	*Dum*Ret*	0.203***	0.203***	0.110***	0.110***	0.057***	0.057***
		(15.211)	(15.305)	(5.243)	(5.254)	(3.353)	(3.357)
β_4	*r_Prem*		0.004		-0.056**		-0.024
			(0.282)		(-2.323)		(-1.170)
β_5	*r_Prem*Dum*		-0.012		0.028		-0.005
			(-0.604)		(0.907)		(-0.190)
β_6	*r_Prem*Ret*		0.037		0.078**		0.045
			(1.457)		(2.434)		(1.629)
$\boldsymbol{\beta_7}$	***r_Prem*Dum*Ret***		**-0.084****		**-0.173*****		**-0.139*****
			(-2.004)		**(-2.921)**		**(-2.733)**
N		6,168	6,168	4,660	4,660	3,530	3,530
R-squared		0.116	0.118	0.010	0.013	0.009	0.012

This table reports the results of the first hypothesis testing the association between the target's conservative accounting and the takeover premium. Columns (1) and (2) report the results when estimating the target's conservative accounting using the earnings-based Basu (1997) measure. Columns (3) and (4) present the results when estimating conservatism using the accruals-based Basu measure *without* excluding targets in the financial and utility industries. Columns (5) and (6) reports the results when estimating conservatism using the accruals-based Basu measure and excluding targets in the financial and utility industries. *r_Prem* represents the measure of the unexplained takeover premium (i.e., residuals obtained from the first-stage regression). *t*-statistics are reported in parentheses under coefficients estimates. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.7.3 Cross-sectional differences in the impact of target's conservative accounting

To test the second hypothesis, Eq. (4) is re-estimated after splitting the full sample of firm-year observations in the second-stage regressions into two subsamples based on whether the target's ex ante asymmetric information is high or low. This study uses three proxies for the target's asymmetric information: stock return volatility, bid-ask spread, and firm size. Targets are classified as with high (low) information asymmetry if the target's stock return volatility or bid-ask spread is greater than (lower than or equals) their

sample medians. Also, smaller targets with market capitalization lower than the sample median of target size are classified as the high information asymmetry subsample.

Table 4.6 presents the results for testing the second hypothesis. Panel A shows the results of testing the second hypothesis by estimating Eq. (4) that uses the earnings-based Basu measure. The results show that the negative association between the target's conservative accounting and the takeover premium is statistically significant and stronger when the target's ex ante asymmetric information is high. In particular, splitting the sample based on the level of the target's ex ante stock return volatility, the results demonstrate that the coefficient of the interaction term between the target's conservatism and the takeover premium, β_7, equals -0.113 that is higher than its corresponding value when using the full sample (β_7 = -0.084), as reported in column (2) of Table 4.5. However, β_7 turns to be positive and insignificant in the low stock return volatility subsample. When splitting the sample based on the target's ex ante bid-ask spread, the coefficient β_7 is also higher in the subsample of the high target's bid-ask spread than its value when using the full sample (β_7 = -0.128 in column (3) of Table 4.6 compared to β_7 = -0.084 in Table 4.5) and insignificantly positive when the target's bid-ask spread is low. Re-estimating Eq. (4) for subsamples of small target firms (higher asymmetric information) and large target firms (lower asymmetric information) also yield consistent results. β_7 is statistically significant only in the small target firms subsample and its value is greater than its value for the full sample.

These results are consistent with the prediction of the second hypothesis that the negative association between the target's conservative accounting and the takeover premium is more pronounced when the target's ex ante information asymmetry is high. Therefore, consistent with the winner's curse prediction, the results suggest that the probability that the winning acquirer overpays to target shareholders decreases when the uncertainty about the target's value decreases.

Panel B of Table 4.6 presents the results when estimating Eq. (4) using the accruals-based Basu measure of conservatism. The results are also consistent with the prediction of the second hypothesis. That is, β_7 is only statistically significant for subsamples of target firms with high stock return volatility and high bid-ask spread. However, β_7 is not statistically significant for target firms with low asymmetric information. Panel C reports the results when estimating Eq. (4) using the accruals-based Basu measure after excluding deals of target firm belonging to the financial and utility

industries. The results also hold consistent with previous tests. β_7 is only statistically significant for subsamples of target firms with high ex ante asymmetric information.

Table 4.6
Cross-Sectional differences in the impact of target's conservative accounting (H_2)

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{i.t} * Dum_{i,t-z} + \beta_6 r\_Prem_{i.t} * Ret_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} + \varepsilon_{i,t-z}$$

Panel A: Earnings-based Basu (1997)

Coeff.	Variables	Tar_Vol		Tar_BidAsk		Tar_Size	
		High	Low	High	Low	Small	Large
β_0	*Intercept*	0.040***	0.063***	0.034***	0.064***	0.060***	0.061***
		(6.980)	(22.003)	(5.933)	(22.075)	(11.469)	(16.554)
β_1	*Dum*	-0.000	0.011**	-0.004	0.013**	0.001	-0.003
		(-0.018)	(2.062)	(-0.501)	(2.524)	(0.146)	(-0.558)
β_2	*Ret*	-0.004	0.054***	0.000	0.060***	0.010	-0.001
		(-0.406)	(6.754)	(0.050)	(7.211)	(0.828)	(-0.127)
β_3	*Dum*Ret*	0.185***	0.130***	0.169***	0.106***	0.216***	0.163***
		(10.915)	(5.052)	(10.063)	(4.073)	(11.442)	(8.449)
β_4	*r_Prem*	-0.004	0.035*	-0.008	0.033**	0.007	0.002
		(-0.181)	(1.960)	(-0.392)	(2.262)	(0.316)	(0.094)
β_5	*r_Prem*Dum*	-0.007	0.001	-0.015	0.010	-0.016	-0.009
		(-0.297)	(0.045)	(-0.567)	(0.390)	(-0.615)	(-0.340)
β_6	*r_Prem*Ret*	0.050*	0.001	0.050*	0.003	0.069**	-0.007
		(1.803)	(0.015)	(1.760)	(0.101)	(2.029)	(-0.179)
$\boldsymbol{\beta_7}$	***r_Prem*Dum*Ret***	**-0.113****	**0.096**	**-0.128*****	**0.038**	**-0.111****	**-0.079**
		(-2.443)	**(0.795)**	**(-2.698)**	**(0.374)**	**(-2.079)**	**(-1.174)**
N		3,083	3,085	3,080	3,088	3,083	3,085
R-squared		0.091	0.121	0.087	0.119	0.137	0.083

Panel B: Accruals-based Basu with including financial firms

Coeff.	Variables	Tar_Vol		Tar_BidAsk		Tar_Size	
		High	Low	High	Low	High	Low
β_0	*Intercept*	-0.074***	-0.058***	-0.066***	-0.059***	-0.089***	-0.055***
		(-8.649)	(-7.847)	(-7.882)	(-7.627)	(-9.976)	(-8.935)
β_1	*Dum*	0.004	0.009	-0.002	0.009	0.011	0.005
		(0.331)	(0.747)	(-0.151)	(0.733)	(0.847)	(0.600)
β_2	*Ret*	-0.010	-0.092***	-0.017	-0.098***	-0.007	-0.053***
		(-0.807)	(-4.073)	(-1.424)	(-3.951)	(-0.528)	(-3.413)
β_3	*Dum*Ret*	0.061**	0.261***	0.074***	0.255***	0.068**	0.142***
		(2.452)	(5.237)	(2.929)	(5.159)	(2.404)	(4.505)
β_4	*r_Prem*	-0.042	-0.092*	-0.052*	-0.053	-0.037	-0.079***
		(-1.525)	(-1.723)	(-1.824)	(-0.997)	(-1.027)	(-2.861)
β_5	*r_Prem*Dum*	0.027	0.035	0.027	0.013	-0.005	0.078**
		(0.764)	(0.474)	(0.749)	(0.182)	(-0.107)	(2.085)
β_6	*r_Prem*Ret*	0.064**	0.128	0.081**	0.033	0.078**	0.082
		(2.037)	(0.995)	(2.428)	(0.239)	(1.989)	(1.470)
$\boldsymbol{\beta_7}$	***r_Prem*Dum*Ret***	**-0.128****	**-0.299**	**-0.159*****	**-0.210**	**-0.190*****	**-0.175***
		(-2.132)	**(-1.264)**	**(-2.590)**	**(-0.914)**	**(-2.600)**	**(-1.677)**
N		2,328	2,332	2,329	2,331	2,329	2,331
R-squared		0.007	0.043	0.010	0.037	0.007	0.032

Panel C: Accruals-based Basu with excluding financial firms

Coeff.	Variables	Tar_Vol		Tar_BidAsk		Tar_Size	
		High	Low	High	Low	High	Low
β_0	*Intercept*	-0.069***	-0.057***	-0.066***	-0.058***	-0.077***	-0.055***
		(-7.705)	(-8.278)	(-7.421)	(-8.509)	(-8.226)	(-9.383)
β_1	*Dum*	0.000	-0.005	-0.014	0.003	-0.001	-0.000
		(0.002)	(-0.421)	(-1.075)	(0.314)	(-0.079)	(-0.045)
β_2	*Ret*	-0.017	-0.053***	-0.018*	-0.056***	-0.014	-0.040***
		(-1.564)	(-2.908)	(-1.656)	(-3.052)	(-1.161)	(-2.949)
β_3	*Dum*Ret*	0.038*	0.095**	0.026	0.097***	0.028	0.073***
		(1.783)	(2.437)	(1.171)	(2.689)	(1.136)	(3.093)
β_4	*r_Prem*	-0.001	-0.054	-0.005	-0.031	-0.003	-0.055**
		(-0.034)	(-1.387)	(-0.171)	(-1.089)	(-0.084)	(-1.969)
β_5	*r_Prem*Dum*	-0.009	-0.027	-0.009	-0.011	-0.056	0.070*
		(-0.250)	(-0.450)	(-0.238)	(-0.218)	(-1.384)	(1.745)
β_6	*r_Prem*Ret*	0.038	0.026	0.050	-0.034	0.037	0.067
		(1.343)	(0.244)	(1.623)	(-0.505)	(1.202)	(1.182)
$\boldsymbol{\beta_7}$	***r_Prem*Dum*Ret***	**-0.100***	**-0.226**	**-0.126****	**-0.047**	**-0.170*****	**-0.143**
		(-1.830)	**(-1.248)**	**(-2.229)**	**(-0.322)**	**(-2.779)**	**(-1.242)**
N		1,763	1,767	1,762	1,768	1,765	1,765
R-squared		0.008	0.026	0.010	0.028	0.007	0.031

This table reports the results of the second hypothesis testing the association between the target's conservative accounting and the takeover premium depending on the level of the target's ex ante asymmetric information. *r_Prem* is the unexplained part (residuals) of the takeover premium. Residuals are obtained from estimating Eq. (1) as a first-stage regression using *Premium* that is calculated as the ratio of the share price offered by the acquirer to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. Residuals, *r_Prem*, are then interacted with Basu (1997) conservatism measure in a second-stage regression for testing hypotheses. *t*-statistics are reported in parentheses under coefficients estimates. The full sample is split into two subsamples based on the level of the target's asymmetric information, as measured by the target's idiosyncratic stock return volatility, *Tar_Vol*, bid-ask spread, *Tar_BidAsk*, or firm size, *Tar_Size*. Targets are classified as with high ex ante asymmetric information if *Tar_Vol* or *Tar_BidAsk* is greater than the sample median or if the target size, *Tar_Size*, is lower than the sample median. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

Collectively, the results show that the role of the target's conservative accounting in mitigating the negative consequences of the target's asymmetric information on the acquirer's overpayment is more prominent when targets have higher levels of information asymmetry over the period preceding the acquisition announcement date.

4.8 Robustness checks

Several sensitivity tests are conducted to evaluate the robustness of the results of this study as follows:

4.8.1 Alternative specifications of the takeover premium

This study uses two alternative specifications when calculating the takeover premium. First, the initial price offered by the winning acquirer to target shareholders might not be the same as the actual offer price paid by the acquirer to get control over the target firm. While the initial offer price is more likely to be determined by the acquirer based on the target's available public information, mainly including the target's financial statements, the determination of the final price paid by the winning acquirer might be influenced by the acquirer's access to some private information during the transactional diligence review after signing the acquisition agreement. To consider the potential changes in the initial offer price that might be attributed to the revelation of private information during the due diligence process and not the target's conservative accounting, this study alternatively uses the initial price offered by the winning acquirer to target shareholders in calculating the takeover premium. The initial premium is calculated as the ratio of the initial price offered by the acquirer to target shareholders, as reported by Thomson Reuters Eikon, relative to the target's closing share price four weeks prior to the deal announcement date, minus one. Therefore, Eqs. (1) and (4) are re-estimated using the initial premium rather than the final premium used in main analyses.

The results of using the initial offer price to calculate the takeover premium and the use of the earnings-based Basu (1997) conservatism measure are presented in Panel A of Table 4.7. Consistent with the prediction of the first hypothesis (H1), β_7 is significantly negative. As for H2, the results show that the negative association between the target's conservative accounting and the takeover premium is more pronounced when the target's stock return volatility or bid-ask spread is high. However, β_7 becomes insignificant when splitting the sample based on target size. Thus, the results are generally consistent with the main results presented in Tables 4.5 and 4.6.

Second, as the takeover premium represents the premium over the target's share price, the literature usually uses the target's share price about one month prior to the acquisition announcement date because it is arguably not affected by any information that is related to the acquisition itself. Eaton et al. (2019) show that using the target's share

price one month prior to the acquisition announcement as a benchmark in estimating the takeover premium might provide an underestimated estimation of the premium. They provide evidence that the use of the target's share price around four months prior to the acquisition announcement date provides a more accurate estimation of the takeover premium.

Therefore, as a robustness check, this study uses an alternative measure of the takeover premium that is estimated as the ratio of the share price offered by the acquirer to target shareholders relative to the target's closing share price 85 trading days (about four months) prior to the acquisition announcement date, minus one. The premium measure is used in the first stage (Eq. (1)) and then residuals are interacted with the earnings-based Basu conservatism measure (Eq. (4)) in the second stage to test hypotheses. Panel B of Table 4.7 reports the results of the second-stage regressions. The results are consistent with the conjectures that the takeover premium is lower for targets that report conservatively and that this effect is more pronounced when target firms have higher levels of information asymmetry.

Table 4.7
Alternative specifications of calculating takeover premium

Panel A: The initial takeover premium

Coeff.	Variables	H1	H2					
			Tar_Vol		Tar_BidAsk		Tar_Size	
			High	Low	High	Low	Small	Large
β_0	*Intercept*	0.057***	0.036***	0.058***	0.028***	0.060***	0.057***	0.058***
		(17.479)	(6.038)	(19.733)	(4.610)	(19.863)	(9.936)	(15.333)
β_1	*Dum*	-0.003	-0.004	0.010*	-0.007	0.011**	-0.005	-0.006
		(-0.725)	(-0.462)	(1.796)	(-0.785)	(2.012)	(-0.618)	(-1.004)
β_2	*Ret*	-0.005	-0.012	0.051***	-0.004	0.053***	-0.002	-0.009
		(-0.687)	(-1.281)	(6.580)	(-0.465)	(6.245)	(-0.140)	(-0.892)
β_3	*Dum*Ret*	0.192***	0.173***	0.129***	0.155***	0.097***	0.202***	0.155***
		(13.764)	(9.796)	(4.670)	(8.884)	(3.481)	(10.428)	(7.328)
β_4	*r_Prem*	0.002	-0.006	0.039**	-0.015	0.038**	0.015	-0.013
		(0.141)	(-0.264)	(1.966)	(-0.673)	(2.294)	(0.659)	(-0.619)
β_5	*r_Prem*Dum*	-0.017	-0.014	-0.004	-0.014	0.021	-0.032	-0.004
		(-0.788)	(-0.527)	(-0.113)	(-0.495)	(0.739)	(-1.095)	(-0.128)
β_6	*r_Prem*Ret*	0.024	0.039	-0.025	0.039	-0.010	0.028	0.013
		(0.876)	(1.277)	(-0.546)	(1.269)	(-0.282)	(0.816)	(0.308)
β_7	***r_Prem*Dum*Ret***	**-0.084***	**-0.115****	**0.109**	**-0.136*****	**0.175**	**-0.083**	**-0.133**
		(-1.844)	**(-2.311)**	**(0.798)**	**(-2.671)**	**(1.568)**	**(-1.489)**	**(-1.634)**
N		5,209	2,600	2,609	2,603	2,606	2,603	2,606
R-squared		0.104	0.074	0.125	0.071	0.113	0.115	0.077

Panel B: The takeover premium based on the target's share price 85 days prior to the acquisition announcement date

Coeff.	Variables	H1	H2					
			Tar_Vol		Tar_BidAsk		Tar_Size	
			High	Low	High	Low	Small	Large
β_0	*Intercept*	0.061***	0.040***	0.063***	0.034***	0.064***	0.062***	0.060***
		(19.448)	(7.048)	(21.520)	(5.937)	(21.880)	(11.630)	(16.900)
β_1	*Dum*	0.000	-0.001	0.011**	-0.004	0.013**	-0.000	-0.003
		(0.068)	(-0.089)	(2.009)	(-0.529)	(2.519)	(-0.043)	(-0.622)
β_2	*Ret*	0.002	-0.004	0.053***	-0.000	0.059***	0.005	-0.001
		(0.249)	(-0.473)	(6.576)	(-0.004)	(7.134)	(0.449)	(-0.094)
β_3	*Dum*Ret*	0.204***	0.185***	0.130***	0.169***	0.104***	0.220***	0.161***
		(15.279)	(10.934)	(5.017)	(10.068)	(4.013)	(11.648)	(8.428)
β_4	*r_Prem*	-0.005	-0.015	0.031**	-0.011	0.017	-0.003	-0.005
		(-0.385)	(-0.978)	(2.316)	(-0.699)	(1.478)	(-0.178)	(-0.357)
β_5	*r_Prem*Dum*	-0.000	0.004	0.006	-0.006	0.019	0.006	-0.008
		(-0.022)	(0.188)	(0.285)	(-0.264)	(1.058)	(0.248)	(-0.407)
β_6	*r_Prem*Ret*	0.028	0.039*	-0.018	0.032	0.015	0.067***	-0.018
		(1.449)	(1.886)	(-0.572)	(1.530)	(0.611)	(2.610)	(-0.672)
β_7	***r_Prem*Dum*Ret***	**-0.055***	**-0.082****	**0.115**	**-0.081****	**-0.020**	**-0.089****	**-0.005**
		(-1.706)	**(-2.317)**	**(1.375)**	**(-2.229)**	**(-0.272)**	**(-2.038)**	**(-0.108)**
N		6,168	3,083	3,085	3,080	3,088	3,083	3,085
R-squared		0.118	0.090	0.121	0.086	0.120	0.140	0.084

This table presents the results for testing hypotheses using alternative measures of the takeover premium. Panel A reports the results of using the initial takeover premium estimated as the ratio of the initial price offered by the acquirer to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, minus one. Panel B presents the results of using the takeover premium estimated as the ratio of the price paid by the acquirer to target shareholders relative to the target's closing share price 85 days (about four months) prior to the deal announcement date, minus one. This table only reports the results of the second-stage regressions (using Eq. (4)) examining the association between the target's conservatism (based on the earnings-based Basu measure) and the unexplained part of the takeover premium (H1) as well as the cross-sectional differences of the impact of the target's conservatism by splitting the full sample into two subsamples based on the level of the target's ex ante asymmetric information (H2). Earnings and adjusted-market returns are winsorised at the 1% and 99% to minimise the effect of outliers. t-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

4.8.2 Using a one-stage approach for testing hypotheses

Some studies show that the use of residuals obtained from a first-stage regression and then regressing residuals on the main variable of interest in a second-stage regression might yield biases in coefficients and t-statistics and, therefore, incorrect inferences (Chen et al., 2018b; Christodoulou et al., 2018). Consequently, to provide confidence in the results and avoid incorrect inferences arising from the use of the two-stage approach, this study alternatively uses the standard one-stage to test hypotheses. Specifically, the raw values of the takeover premium, *Premium*, as measured by the ratio of the share price offered by the acquirer to the target's closing share price four weeks prior to the deal

announcement date, minus one, are interacted with all variables of the earnings-based Basu (1997) conservatism measure. Table 4.8 reports the results when using the standard one-stage approach. The results are similar to those of the main analyses reported in Tables 4.5 and 4.6.

Table 4.8
Using a one-stage approach

Coeff.	Variables	H1	H2					
			Tar_Vol		Tar_BidAsk		Tar_Size	
			High	Low	High	Low	Small	Large
β_0	*Intercept*	0.067***	0.047***	0.051***	0.042***	0.054***	0.070***	0.065***
		(11.562)	(4.536)	(8.368)	(3.948)	(10.108)	(7.012)	(9.608)
β_1	*Dum*	0.004	0.002	0.014	0.001	0.011	0.004	0.001
		(0.467)	(0.130)	(1.203)	(0.058)	(1.008)	(0.302)	(0.108)
β_2	*Ret*	-0.014	-0.033**	0.063***	-0.025	0.055***	-0.030	0.005
		(-1.041)	(-1.982)	(3.929)	(-1.508)	(4.129)	(-1.436)	(0.280)
β_3	*Dum*Ret*	0.246***	0.247***	0.098**	0.231***	0.108**	0.288***	0.199***
		(10.964)	(8.890)	(1.961)	(8.423)	(2.243)	(9.113)	(5.888)
β_4	*Premium*	-0.017	-0.015	0.035**	-0.018	0.028**	-0.021	-0.016
		(-1.385)	(-0.874)	(2.221)	(-0.984)	(2.269)	(-1.190)	(-0.980)
β_5	*Premium*Dum*	-0.007	-0.003	-0.010	-0.009	0.007	-0.006	-0.009
		(-0.433)	(-0.127)	(-0.345)	(-0.389)	(0.304)	(-0.253)	(-0.346)
β_6	*Premium*Ret*	0.039*	0.064***	-0.030	0.057**	0.017	0.083***	-0.013
		(1.792)	(2.629)	(-0.658)	(2.277)	(0.567)	(2.734)	(-0.401)
$\boldsymbol{\beta_7}$	***Premium*Dum*Ret***	**-0.101*****	**-0.130*****	**0.094**	**-0.133*****	**0.001**	**-0.151*****	**-0.096**
		(-2.670)	**(-3.117)**	**(0.774)**	**(-3.118)**	**(0.006)**	**(-3.139)**	**(-1.492)**
N		6,168	3,083	3,085	3,080	3,088	3,083	3,085
R-squared		0.118	0.093	0.120	0.088	0.120	0.137	0.085

This table reports the results for testing hypotheses by interacting the raw values of the takeover premium measure, *Premium,* (rather than residuals) with the earnings-based Basu (1997) conservatism measure. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by both year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.8.3 Alternative measures for target's conservative accounting

Although Basu (1997) asymmetric timeliness measure is the most common measure for conservative accounting, it is argued that this measure is vulnerable to measurement biases and errors (Dietrich et al., 2007; Givoly et al., 2007). Further, Basu (1997) uses positive and negative stock returns to proxy for good and bad economic news, respectively, which might be vulnerable to market mispricing (Beatty, 2007). Therefore, to mitigate the sensitivity of results to the measure used for conservative accounting, this study uses two alternative measures of conservatism as discussed below.

4.8.3.1 Ball and Shivakumar (2005) accruals-based measure

This study uses Ball and Shivakumar (2005) accruals-based measure as an alternative measure for the target's conservative accounting. This measure employs the same idea of the asymmetric timeliness of good and bad news and a similar model structure as in Basu (1997) measure. However, this measure uses a nonmarket-based proxy for economic gains and losses as a regressor (namely, cash flows from operations), rather than stock returns and, therefore, it is less vulnerable to market mispricing and market-wide shocks. In addition, in the same spirit of Collins et al. (2014) recommendation of controlling for the cash flow asymmetry by using accruals rather than earnings in Basu (1997), this measure uses accounting accruals as a regressand in estimating conservatism and, therefore, would be less vulnerable to endogeneity concerns arising from potential omitted correlated variables. Therefore, as Ball & Shivakumar measure uses a different earnings variable as a regressand (namely, accounting accruals) and a nonmarket-based proxy for economic gains and losses as a regressor (namely, cash flows from operations), this measure avoids some of the limitations addressed against Basu measure in the literature.

To capture the target's pre-merger commitment of using conservative accounting, the following Ball and Shivakumar (2005) piece-wise model is estimated over a pooled cross-section time-series window of five years ending at the target's latest fiscal year-end prior to the deal announcement date:

$$Acc_{i,t-z} = \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \varepsilon_{i,t-z} \qquad (5)$$

where t represents the deal announcement year, and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. Following Hribar and Collins (2002), the direct method in calculating operating accruals and cash flow from continuing operations is used. $Acc_{i,t-z}$ represents operating accruals calculated as earnings before extraordinary and exceptional items (Compustat item: ib) minus cash flows from continuing operations. Cash flows from continuing operations is calculated as cash flows from operations minus extraordinary items and discontinued operations as directly retrieved from the statement of cash flows (Compustat items: [oancf – xidoc]). $CF_{i,t-z}$ represents either normal cash flows from continuing operations or the industry and year median-adjusted cash flows

from continuing operations.[34] Both operating accruals, $Acc_{i,t-z}$, and cash flows from continuing operations, $CF_{i,t-z}$, are standardised by total assets (Compustat item: at) at the beginning of the fiscal year. $D_{i,t-z}$ is a dummy variable for bad news that equals one when $CF_{i,t-z}$ is negative, and zero otherwise.

Consistent with Dechow et al. (1998), the correlation between cash flows and accruals, i.e., β_2, is expected to be negative. According to conservative accounting, in periods of bad news (i.e., negative cash flows from continuing operations), it is expected that the coefficient of the interaction between cash flows and the dummy variable of cash flow, β_3, to be positive. Therefore, higher values of β_3 reflects higher degrees of conservatism.

Similar to the main analysis, to test the relation between the target's pre-merger conservative accounting and the takeover premium, residuals of the takeover premium are interacted with all explanatory variables of Ball and Shivakumar (2005) measure as follows:

$$\begin{aligned} Acc_{i,t-z} = {} & \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \beta_4 r\_Prem_{i,t} \\ & + \beta_5 r\_Prem_{\ i.t} * D_{i,t-z} + \beta_6 r\_Prem_{\ i.t} * CF_{i,t-z} \\ & + \boldsymbol{\beta_7 r\_Prem_{\ i.t} * D_{i,t-z} * CF_{i,t-z}} + \varepsilon_{i,t-z} \end{aligned} \quad (6)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. Dechow et al. (1998) show that accruals are negatively correlated with cash flows, so that β_2 is expected to be negative. Based on Ball and Shivakumar (2005), the coefficient of the interaction between cash flows and the dummy variable of negative cash flow, β_3, reflects the asymmetric timeliness of economic gains and losses, i.e., conservative accounting, and is expected to be positive. $r\_Prem_{i,t}$ is the unexplained part of the takeover premium, i.e., residuals obtained from the first-stage regression. $r\_Prem_{i,t}$ is interacted with $D_{i,t-z} * CF_{i,t-z}$ to test the association between the target's conservative accounting and the takeover premium. Thus, β_7 is the coefficient of the primary interest and is expected to be negative. No

[34] The industry and year median-adjusted cash flows from continuing operations is calculated as the difference between each target firm cash flows from continuing operations standardised by lagged total assets in a specific calendar year and the median of cash flows from continuing operations standardised by lagged total assets for all targets in the same industry (Fama-French 12 industry classification is used) and calendar year. A minimum of 10 target firms in the same industry and calendar year is required to calculate the median of cash flows and to include firm-year observations in analyses.

predictions are offered for other coefficients including β_0, β_1, β_4, β_5, and β_6. Accruals and cash flows from continuing operations ($Acc_{i,t-z}$ and $CF_{i,t-z}$), after being standardised by total assets at the beginning of the fiscal year, are winsorised at the 1% and 99% to minimise the effect of outliers. Standard errors of the parameter estimates are clustered by year and target-firm to correct for heteroskedasticity and time-series and cross-section correlations (Petersen, 2009).

Table 4.9 presents the results for Ball and Shivakumar (2005) conservatism measure. Panel A presents the results when $CF_{i,t-z}$ is calculated as the normal cash flows from continuing operations, while Panel B reports the results when calculating $CF_{i,t-z}$ as the industry and year median-adjusted cash flows from continuing operations. The results of panel A show that, for the full sample, β_3 is positive and statistically significant, connoting that target firms are, on average, conservative in their financial reporting. As for the first hypothesis, β_7 is significantly negative at the 10% level (t = -1.766), suggesting that the winning acquirer is more likely to pay a lower premium when target firms conservatively report over the years leading to an acquisition. As for the second hypothesis, when splitting the full sample into subsamples based on the target's ex ante information asymmetry, the results demonstrate that β_7 is only negative and statistically significant when target firms have high ex ante asymmetric information, irrespective of whether asymmetric information is measured by the target's stock return volatility, bid-ask spread, or firm size. The magnitude of the coefficient β_7 is also greater for subsamples of target firms with high ex ante asymmetric information compared with its value for the full sample. For instance, when using the target's bid-ask spread to proxy for asymmetric information, β_7 is equal to -0.299 in the subsample of target firms with high bid-ask spread compared to -0.213 in the full sample. However, β_7 is insignificantly negative, or even positive, when the target's ex ante asymmetric information is low. Therefore, consistent with the winner's curse predictions that uncertainty about the target's value increases the incidence and magnitude of the overpayment, the results suggest that the role of accounting conservatism of target firms in protecting acquirers from overpayment is more prominent when target firms have high levels of asymmetric information. The results reported in Panel B when calculating $CF_{i,t-z}$ as the industry and year median-adjusted cash flows from continuing operations are consistent with those reported in Panel A. Therefore, the results of using Ball and Shivakumar (2005) conservatism measure are generally consistent with those reported in the main analyses.

Table 4.9

Alternative measure for target's conservative accounting: Ball and Shivakumar (2005)

$$Acc_{i,t-z} = \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{i.t} * D_{i,t-z} + \beta_6 r\_Prem_{i.t} * CF_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{i.t} * D_{i,t-z} * CF_{i,t-z}} + \varepsilon_{i,t-z}$$

Panel A: Using normal operating cash flows

Coeff.	Variables	H1		H2					
				Vol		Bid		Size	
				High	Low	High	Low	Small	large
β_0	*Intercept*	-0.013***	-0.013***	-0.024***	-0.005***	-0.027***	-0.003*	-0.011***	-0.013***
		(-6.332)	(-6.338)	(-6.339)	(-2.707)	(-6.643)	(-1.860)	(-3.904)	(-4.597)
β_1	*D*	0.001	0.000	-0.000	0.010	0.001	0.006	-0.007	0.013
		(0.156)	(0.014)	(-0.003)	(1.234)	(0.107)	(0.779)	(-0.883)	(0.997)
β_2	*CF*	-0.446***	-0.446***	-0.420***	-0.456***	-0.389***	-0.486***	-0.520***	-0.407***
		(-22.498)	(-22.561)	(-13.482)	(-19.434)	(-11.727)	(-23.288)	(-15.753)	(-15.992)
β_3	*D*CF*	0.530***	0.529***	0.488***	0.302***	0.455***	-0.266**	0.562***	0.571***
		(11.981)	(12.257)	(9.463)	(2.971)	(8.699)	(-2.011)	(10.154)	(6.821)
β_4	*r_Prem*		-0.008	-0.004	-0.006	-0.006	-0.000	-0.006	-0.012
			(-0.912)	(-0.343)	(-0.554)	(-0.561)	(-0.016)	(-0.657)	(-0.667)
β_5	*r_Prem*D*		-0.002	-0.003	0.040	-0.006	0.010	-0.004	-0.014
			(-0.094)	(-0.147)	(1.594)	(-0.242)	(0.432)	(-0.171)	(-0.283)
β_6	*r_Prem*CF*		0.014	0.032	-0.071	0.068	-0.156	0.054	-0.034
			(0.184)	(0.340)	(-0.561)	(0.689)	(-1.503)	(0.636)	(-0.239)
$\boldsymbol{\beta_7}$	***r_Prem*D*CF***		**-0.213***	**-0.256***	**0.790*****	**-0.299****	**-0.261**	**-0.286****	**-0.222**
			(-1.766)	**(-1.917)**	**(3.733)**	**(-2.185)**	**(-0.642)**	**(-2.043)**	**(-0.901)**
N		4,660	4,660	2,328	2,332	2,329	2,331	2,329	2,331
R-squared		0.133	0.138	0.098	0.288	0.083	0.399	0.127	0.163

Panel B: Using industry and year median-adjusted operating cash flows

Coeff.	Variables	H1		H2					
				Vol		Bid		Size	
				High	Low	High	Low	Small	large
β_0	*Intercept*	-0.040***	-0.040***	-0.052***	-0.033***	-0.053***	-0.032***	-0.040***	-0.040***
		(-17.000)	(-17.141)	(-11.357)	(-13.937)	(-11.225)	(-13.898)	(-10.281)	(-13.864)
β_1	*D*	0.013***	0.012***	0.013**	0.009***	0.012*	0.005	0.011**	0.013**
		(3.523)	(3.499)	(2.044)	(2.702)	(1.864)	(1.440)	(2.067)	(2.574)
β_2	*CF*	-0.440***	-0.438***	-0.420***	-0.414***	-0.383***	-0.483***	-0.572***	-0.378***
		(-12.939)	(-13.151)	(-8.981)	(-9.020)	(-7.753)	(-11.569)	(-9.786)	(-9.584)
β_3	*D*CF*	0.484***	0.482***	0.454***	0.224***	0.417***	0.127	0.602***	0.443***
		(10.836)	(11.052)	(8.052)	(2.848)	(7.124)	(1.331)	(8.965)	(6.403)
β_4	*r_Prem*		-0.034***	-0.031**	-0.024*	-0.030**	-0.029**	-0.021	-0.052***
			(-3.057)	(-2.111)	(-1.667)	(-1.963)	(-2.331)	(-1.524)	(-3.128)
β_5	*r_Prem*D*		0.027*	0.027	0.042**	0.023	0.040***	0.020	0.024
			(1.865)	(1.411)	(2.480)	(1.145)	(2.629)	(1.117)	(0.875)
β_6	*r_Prem*CF*		0.243**	0.276**	0.124	0.322**	-0.051	0.292**	0.216
			(2.056)	(2.006)	(0.515)	(2.243)	(-0.291)	(2.169)	(1.175)
$\boldsymbol{\beta_7}$	***r_Prem*D*CF***		**-0.418*****	**-0.477*****	**0.338**	**-0.524*****	**0.160**	**-0.482*****	**-0.421***
			(-3.055)	**(-3.065)**	**(1.222)**	**(-3.257)**	**(0.620)**	**(-3.022)**	**(-1.863)**
N		4,019	4,019	2,007	2,012	2,007	2,012	2,006	2,013
R-squared		0.090	0.098	0.079	0.183	0.065	0.270	0.099	0.112

This table presents the results for testing hypotheses using Ball and Shivakumar (2005) measure of conservatism. Panel A presents the results when $CF_{i,t-z}$ is calculated as the normal cash flows from continuing operations, while Panel B reports the results when calculating $CF_{i,t-z}$ as the industry and year median-adjusted cash flows from continuing operations. *r_Prem* is the unexplained part (residuals) of the takeover premium. Residuals are obtained from estimating Eq. (1) as a first-stage regression using *Premium* that is calculated as the ratio of the share price offered by the acquirer to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. Residuals, *r_Prem*, are then interacted with Ball and Shivakumar (2005) conservatism measure in a second-stage regression for testing hypotheses. $Acc_{i,t-z}$ is operating accruals calculated as earnings before extraordinary and exceptional items (Compustat item: ib) minus cash flows from continuing operations (Compustat items: [oancf – xidoc]). Cash flows from continuing operations is calculated as cash flows from operations minus extraordinary items and discontinued operations as directly retrieved from the statement of cash flows (Compustat items: [oancf – xidoc]). Both operating accruals and cash flows from continuing operations are standardised by total assets (Compustat item: at)

at the beginning of the fiscal year. $D_{i,t-z}$ is a dummy variable for bad news that equals one when $CF_{i,t-z}$ is negative, and zero otherwise. Both $Acc_{i,t-z}$ and $CF_{i,t-z}$, after being standardised by total assets at the beginning of the fiscal year, are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

4.8.3.2 Khan and Watts (2009) firm-year C_Score

This study uses Khan and Watts (2009) *firm-year C_Score* as an alternative measure for conservatism that has been widely used in the literature (e.g., Beatty & Liao, 2011; Kim et al., 2013; García Lara et al., 2014; André et al., 2015; Balakrishnan et al., 2016; García Lara et al., 2016; Kim & Zhang, 2016; Goh et al., 2017; Hsu et al., 2017).[35] Khan and Watts (2009) build their firm-year measure by drawing on Basu measure. They begin with Basu measure as follows:

$$Earn_i/MV_{i,t-1} = \beta_0 + \beta_1 Dum_i + \beta_2 Ret_i + \beta_3 Dum_i * Ret_i + \varepsilon_i \qquad (7)$$

where $Earn_i/MV_{i,t-1}$ is the target's net income before extraordinary items (Compustat item: *ib*) deflated by the lagged market value of equity (Compustat items: *prcc_f* csho*); Ret_i is the target's market-adjusted annual stock return computed by compounding monthly market-adjusted returns, including dividends, over the fiscal year (CRSP monthly stock file items: *ret* adjusted by the value-weighted market return, *vwretd*). Dum_i is a dummy variable that equals one if Ret_i is negative, and zero otherwise.

Based on the four drivers suggested by Watts (2003a) and explaining the demand for conservatism (i.e., contracting, litigation, taxation, and regulation), Khan and Watts (2009) use three firm-specific characteristics as a summary measures for these drivers

[35] Khan and Watts (2009) demonstrate that the asymmetric timeliness measure of Basu (1997) helps estimate conservatism by using one of two estimation methods. First, by using a time-series analysis, Basu measure can be used to estimate conservatism for individual firms by using the firm's earnings and returns over a time series. Second, by using a cross-section analysis, Basu measure can be used in estimating conservatism for a country- or an industry-year using earnings and returns data for firms in one country or industry in one year. Therefore, using each of these two methods of Basu measure has a limitation. The limitation of using the measure in estimating individual-firms' conservatism (i.e., time-series analysis) is that it does not consider the changes in conservatism for individual firms over the time assuming the stationary of individual-firms' operating characteristics. On the other hand, the limitation of using Basu measure in estimating conservatism for a country- or an industry-year (i.e., cross-section analysis) is its ambiguity regarding the effect of the cross-sectional variation in conservative reporting between firms belonging to the same country or industry on the accuracy of its estimates for conservatism, i.e., the assumption of the homogeneity of different firms.

and incorporate them in Basu measure. Specifically, by using *annual cross-section regression of Basu modified model*, they get average estimates of these characteristics across firms that can be then used to discriminate firms with different degrees of conservative reporting. These characteristics are the market-to-book (MTB) ratio, firm size, and firm leverage. They argue that this parsimonious set of characteristics captures variations in firms' growth options that, in turn, capture variations in the four drivers and, ultimately, conservatism.[36]

Therefore, Khan and Watts (2009) modify the original Basu measure by specifying that β_2 (timeliness of good news; or *G_Score*) and β_3 (the incremental timeliness of bad news, or *C_Score*) as linear functions of the characteristics of each firm in each year. They define that:

$$G\_Score = \beta_2 = \mu_1 + \mu_2 SIZE_i + \mu_3 MTB_i + \mu_4 LEV_i \quad (8)$$

$$C\_Score = \beta_3 = \alpha_1 + \alpha_2 SIZE_i + \alpha_3 MTB_i + \alpha_4 LEV_i \quad (9)$$

where firm size, *SIZE*, is defined as the natural logarithm of the target's market capitalisation. Market-to-book ratio, *MTB*, is calculated as the ratio of the target's market value of equity to its book value of equity. Leverage, *LEV*, is the ratio of the target's long-term debt and short-term debt to its total assets. By substituting Eqs. (8) and (9) into (7), the following ***Basu modified*** model is obtained:

[36] As for MTB ratio, Khan and Watts (2009) argue that there is a direct and indirect relation between MTB ratio and conservatism. Firms having more growth options compared to assets in place have higher MTB ratios. Firms with high growth options are likely to have more agency costs as well as more volatile stock returns that can lead to higher probability of litigation. Therefore, both high agency costs and high probability of litigation indirectly increase the demand for conservatism. In addition, as conservatism imposes asymmetric verification requirements for recognising gains and losses and requires investments outlays to be promptly expensed, conservatism directly leads to cumulative understatement of net assets implying high MTB ratios. As for firm size, Khan and Watts (2009) predict that the demand for conservatism is higher in smaller firms. That is, although large firms have many segments and complex operations, they are more likely to have rich information environment and, therefore, less information asymmetry (e.g., Easley et al., 2002). This suggests less contracting demand for conservatism in larger firms. In addition, they argue that as larger firms have more divisions, accounts and funds, they are more able to smooth earnings and reduce tax liability through managing earnings across these divisions, accounts and funds, and consequently, reducing the taxation demand for conservatism. Last, Khan and Watts (2009) use leverage as another measure of variations in drivers of conservatism. Because agency problems between shareholders and debtholders are more severe in highly levered firms, the contracting demand for conservatism in these firms is higher. That is, conservatism can play a governance role by its effect on the prompt trigger of debt covenant violations and, consequently, constraining managers' opportunistic behaviour against interests of debtholders. In addition, the litigation demand for conservatism is likely higher in financially distressed firms that likely have high leverage levels.

$$
\begin{aligned}
Earn_i/MV_{i,t-1} &= \beta_0 + \beta_1 Dum_i \\
&+ Ret_i(\mu_1 + \mu_2\, SIZE_i + \mu_3\, MTB_i + \mu_4\, LEV_i) + Dum_i \\
&* Ret_i\,(\alpha_1 + \alpha_2\, SIZE_i + \alpha_3\, MTB_i + \alpha_4\, LEV_i) + (\delta_1\, SIZE_i \\
&+ \delta_2\, MTB_i + \delta_3\, LEV_i + \delta_4\, Dum_i * SIZE_i + \delta_5\, Dum_i * MTB_i \\
&+ \delta_6\, Dum_i * LEV_i) + \varepsilon_i
\end{aligned} \tag{10}
$$

The above regression model includes controls for the main effects of firm-specific characteristics as the model includes interactions between these characteristics and returns. This model is estimated annually and cross-sectionally to obtain estimates for μ and α. Then, *G_Score* and *C_Score* are estimated each year over the five years prior to an acquisition by using yearly estimates of μ and α. Thus, *C_Score* represents a firm-year measure of the incremental timeliness of bad news over good news, i.e., conservatism, and higher values of *C_Score* reflect higher levels of conservatism. That is, estimates of μ and α are constant across firms but vary over years because they are estimated using *annual* cross-sectional regressions. Moreover, *G_Score* and *C_Score* will vary across firms according to the variations in firm-specific characteristics. To capture the commitment of target firms of conservative reporting, this study uses the average of *C_Score* over the five fiscal years leading to an acquisition (i.e., from *t-1* to *t-5* where *t* is the fiscal year of the deal announcement). To test hypotheses, the average of *C_Score*, ***C_Score_Avg***, is incorporated into the cross-section regression of Eq. (1) along with other control variables. Specifically, the following cross-section regression model is estimated:

$$
\begin{aligned}
Premium_{i,t} = {} & \alpha_0 + \boldsymbol{\alpha_1 C\_Score\_Avg_i} + \alpha_2 Tar\_Size_{i,t-1} \\
&+ \alpha_3 Tar\_MTB_{i,t-1} + \alpha_4 Tar\_Lev_{i,t-1} + \alpha_5 Tar\_ROE_{i,t-1} \\
&+ \alpha_6 Acq\_Size_{i,t-1} + \alpha_7 Acq\_MTB_{i,t-1} + \alpha_8 Acq\_Lev_{i,t-1} \\
&+ \alpha_9 Acq\_ROE_{i,t-1} + \alpha_{10} Tender_{i,t} + \alpha_{11} Competition_{i,t} \\
&+ \alpha_{12} Hostile_{i,t} + \alpha_{13} Cash_{i,t} + \alpha_{14} Stock_{i,t} + \alpha_{15} SameInd_{i,t} \\
&+ \mu_n\, Year\ dummies + \lambda_n\, Industry\ dummies + \varepsilon_{i,t}
\end{aligned} \tag{11}
$$

Table 4.10 presents the results using Khan and Watts (2009) *C_Score*. The results show that the coefficient of *C_Score_Avg* is significantly negative at the 10% level. Consistent with the first hypothesis, this suggests that the target's conservative reporting is negatively associated with the takeover premium. However, the results of splitting the

full sample based on the target's ex ante asymmetric information do not support the second hypothesis.

Table 4.10
Alternative measure for target's conservative accounting: Khan and Watts (2009)

Variables	H1	H2					
		Vol		Bid		Size	
		High	Low	High	Low	Small	Large
Intercept	0.952***	0.571**	0.959***	0.657***	0.915***	1.550***	0.369**
	(3.204)	(2.482)	(2.858)	(3.042)	(2.898)	(5.707)	(2.031)
C_Score_Avg	**-0.552***	**-0.377**	**-0.410**	**-0.410**	**-0.456**	**-0.196**	**-0.563**
	(-1.679)	**(-0.831)**	**(-0.949)**	**(-0.916)**	**(-0.997)**	**(-0.343)**	**(-1.367)**
Tar_Size	-0.079***	-0.074***	-0.052**	-0.071***	-0.066***	-0.099***	-0.037*
	(-4.853)	(-3.098)	(-2.582)	(-3.038)	(-3.212)	(-3.049)	(-1.694)
Tar_MTB	-0.005	-0.006	-0.004	-0.005	-0.013**	-0.007	-0.003
	(-1.253)	(-1.040)	(-0.689)	(-0.950)	(-2.122)	(-0.977)	(-0.552)
Tar_Lev	0.072	0.077	0.069	0.114	0.107	0.144	0.013
	(1.155)	(0.786)	(1.027)	(1.224)	(1.493)	(1.285)	(0.173)
Tar_ROE	0.008	0.021	-0.036	0.001	0.210***	0.016	-0.038
	(0.226)	(0.542)	(-0.372)	(0.023)	(3.549)	(0.358)	(-0.667)
Acq_Size	0.026***	0.027**	0.017**	0.023**	0.024***	0.031***	0.011
	(3.742)	(2.513)	(2.237)	(2.174)	(3.086)	(3.081)	(1.205)
Acq_MTB	0.010**	0.014**	0.002	0.012**	0.003	0.019*	0.004
	(2.434)	(2.263)	(0.470)	(2.186)	(0.472)	(1.846)	(1.001)
Acq_Lev	-0.118*	-0.062	-0.165**	-0.031	-0.228***	-0.123	-0.113
	(-1.802)	(-0.543)	(-2.458)	(-0.306)	(-3.027)	(-1.094)	(-1.349)
Acq_ROE	0.016	0.045	0.012	0.032	0.009	0.002	0.029
	(0.261)	(0.520)	(0.153)	(0.402)	(0.093)	(0.019)	(0.406)
Tender	0.030	0.043	0.022	0.048	0.036	0.013	0.062*
	(1.117)	(1.060)	(0.701)	(1.271)	(1.016)	(0.302)	(1.753)
Competition	0.166***	0.155*	0.176***	0.126	0.184***	0.184**	0.090*
	(3.547)	(1.850)	(3.201)	(1.638)	(3.175)	(1.966)	(1.756)
Hostile	0.217**	0.430***	0.014	0.350**	0.062	1.015***	0.110
	(1.972)	(2.701)	(0.167)	(2.250)	(0.758)	(7.571)	(1.347)
Cash	0.017	0.040	-0.016	0.049	-0.011	0.013	0.020
	(0.707)	(1.000)	(-0.669)	(1.270)	(-0.389)	(0.326)	(0.690)
Stock	-0.011	0.019	-0.028	0.026	-0.033	-0.024	-0.000
	(-0.515)	(0.455)	(-1.260)	(0.611)	(-1.509)	(-0.667)	(-0.005)
Stock	-0.012	-0.006	-0.030	-0.025	-0.002	-0.008	-0.020
	(-0.590)	(-0.179)	(-1.321)	(-0.764)	(-0.104)	(-0.221)	(-0.834)
Year FE	Included	Included	Included	Included	Included	Included	Included
Industry FE	Included	Included	Included	Included	Included	Included	Included
N	1,425	712	713	712	713	712	713
R-squared	0.200	0.163	0.240	0.177	0.272	0.229	0.232

This table presents the results of using Khan and Watts (2009) *C_Score* measure of accounting conservatism. The dependent variable is the takeover premium and is estimated as the ratio of the share price offered by the acquirer to target shareholders relative to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. All continuous variables are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects and Fama-French 48 industry fixed effects are included in all regressions whose results are supressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.8.4 Endogeneity

As both conservative accounting and takeover deal characteristics including premiums are endogenous variables, in this section concerns about endogeneity are addressed. First, this study examines whether acquirers incur lower premiums offered and paid to target shareholders in takeovers involving targets that have high levels of ex ante conservative accounting. There is a potential endogeneity problem that may arise from a potential reverse causality between the incentives of the target's managers to conservatively report during the period prior to the deal announcement and takeover premium. To mitigate this concern, conservative accounting of target firms is estimated based on a lagged window comprising of targets' five fiscal years ending before the deal announcement date. Thus, conservative accounting is estimated over a period that would make it exogenous to, and unlikely to be influenced by, any expectation of receiving a takeover bid or the deal characteristics. Accordingly, endogeneity arising from simultaneous or reverse causality is unlikely to be a concern in this study.

Second, the literature shows that conservative accounting is determined by different factors, including macro-economic determinants, accounting standards, firm-specific characteristics, accounting choices and managerial incentives (e.g., Watts, 2003a; Ball & Shivakumar, 2005; Qiang, 2007; Khan & Watts, 2009). Therefore, endogeneity arising from correlated omitted variables might be a concern in all research addressing the consequences of conservatism. To address this concern, several control variables are included in first-stage regressions to control for target firm-specific characteristics, including size, market-to-book ratio, leverage, and return on equity, that might be correlated with both the target's conservatism and takeover premium. In addition, dummies for year- and target firm industry-fixed effects are included in first-stage regressions to control for time and industry variations. However, as conservatism is measured over a five-year window prior to the deal announcement date, the results might be driven by other determinants affecting conservatism over this period and are not ruled out when using Basu (1997) measure. Therefore, to correct for the potential bias in estimating conservatism, Ball et al. (2013) suggest including firm fixed-effects to rule out firm-specific effects when estimating conservatism using cross-sectional Basu (1997) measure. However, using fixed effects in this context is infeasible for two main reasons. First, as noted by Collins et al. (2014), including firm fixed-effects would be the best choice when researchers have a relatively large number of observations for each firm such as in large panel data sets. However, this study uses an event-study methodology where

each target firm has a small number of observations that are employed to construct the conservatism measure. Second, to test hypotheses, the dependent variable, representing in residuals of the takeover premium, is interacted with the conservatism measure. This dependent variable varies cross-sectionally, but it is a time-invariant for each target firm over the five-year window. Therefore, this variable will be cancelled out if fixed-effect model is used and, consequently, fixed-effect estimates might be incorrectly specified.

Alternatively, Collins et al. (2014) provide another straightforward solution for the potential bias in differential timeliness coefficients. They demonstrate that the inclusion of asymmetric timeliness of cash flows from operations (CFO) is a main source of bias or noise in measuring conditional accounting conservatism. That is, CFO asymmetry does not reflect the asymmetric verification requirements imposed by conservative accounting practices. Rather, they provide evidence of the systematic variation of CFO with firm characteristics reflecting its life-cycle stage. They show that many biases attributed by researchers to the earnings-based Basu differential timeliness (DT) measure (Givoly et al., 2007; Patatoukas & Thomas, 2011; Ball et al., 2013) are eliminated when removing CFO from earnings. Thus, they recommend removing CFO from earnings and only using accruals in measures of conditional conservatism to rule out the effect of omitted correlated variables mainly incorporated in cash flow asymmetry. Moreover, they find little effect of using fixed-effects on the accrual-based differential timeliness coefficients.

Therefore, in main analyses, this study uses Basu (1997) differential timeliness measure for target firms that is based on accruals, rather than earnings, consistent with Collins et al. (2014), and report consistent results with those obtained from using the original earnings-based Basu (1997) measure for the two hypotheses.

Third, to further mitigate concerns about endogeneity arising from correlated omitted variables, additional controls for target firm-specific characteristics that are shown to be drivers for conservatism including firm size, market to book, and leverage (e.g., Khan & Watts, 2009) are included in main models. Thus, the second-stage regression of Eq. (4) is augmented by including controls for these three target firm characteristics over the five-year window of estimation. Specifically, the following model is tested that is depending on the earnings-based Basu measure, augmented by additional controls for target firm-specific characteristics (size, MTB, and leverage) and interactions with residuals of the takeover premium, $r\_Prem_{i,t}$:

$$
\begin{aligned}
Earn_{i,t-z}/MV_{i,t-z-1} &= \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\
&+ \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{i.t} * Dum_{i,t-z} + \beta_6 r\_Prem_{i.t} \\
&* Ret_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} \\
&+ \beta_8 Size_{i,t-z} + \beta_9 Size_{i.t-z} * Dum_{i,t-z} + \beta_{10} Size_{i.t-z} \\
&* Ret_{i,t-z} + \beta_{11} Size_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{12} MTB_{i,t-z} \\
&+ \beta_{13} MTB_{i.t-z} * Dum_{i,t-z} + \beta_{14} MTB_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{15} MTB_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{16} Leverage_{i,t-z} \\
&+ \beta_{17} Leverage_{i.t-z} * Dum_{i,t-z} + \beta_{18} Leverage_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{19} Leverage_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}
\end{aligned} \tag{12}
$$

Table 4.11 presents the results for estimating Eq. (12). As for H1, the results show that the coefficient of the interaction term *r_Prem*Dum*Ret*, i.e., β_7, holds negative and statistically significant after controlling for firm-specific characteristics over the 5-year window, suggesting that results in main analyses are not driven by potential specification bias of the conservatism measure. When testing H_2 by splitting the sample based on the target's ex ante asymmetric information, the results demonstrate that β_7 is significantly negative only when the target's asymmetric information is high, regardless of the proxy used for asymmetric information. Thus, these results are consistent with those in the main analysis.

Table 4.11
Additional tests addressing endogeneity concerns

Coeff.	Variables	H_1	H_2					
			Volatility		Bid-Ask		Size	
			High	Low	High	Low	Small	large
β_0	*Intercept*	0.059***	0.030	0.093***	0.021	0.086***	0.050*	0.086***
		(5.107)	(1.451)	(7.845)	(0.993)	(8.077)	(1.848)	(4.040)
β_1	*Dum*	0.010	0.025	0.029	0.011	0.042**	0.052	-0.040
		(0.644)	(0.951)	(1.352)	(0.404)	(2.317)	(1.421)	(-1.271)
β_2	*Ret*	0.055**	0.066*	0.088***	0.047	0.116***	0.161***	-0.039
		(2.053)	(1.900)	(2.999)	(1.375)	(4.795)	(3.626)	(-0.720)
β_3	*Dum*Ret*	0.327***	0.283***	0.400***	0.278***	0.280***	0.324***	0.479***
		(7.291)	(5.058)	(3.883)	(4.888)	(3.253)	(4.138)	(4.811)
β_4	*r_Prem*	0.004	-0.000	0.042**	-0.007	0.037***	0.010	0.001
		(0.288)	(-0.022)	(2.455)	(-0.339)	(2.772)	(0.515)	(0.062)
β_5	*r_Prem*Dum*	-0.011	-0.009	-0.004	-0.014	0.005	-0.025	-0.005
		(-0.606)	(-0.371)	(-0.136)	(-0.571)	(0.223)	(-1.011)	(-0.195)
β_6	*r_Prem*Ret*	0.044**	0.053**	-0.014	0.055**	-0.004	0.054**	0.008
		(2.049)	(2.168)	(-0.350)	(2.187)	(-0.174)	(2.012)	(0.241)
β_7	***r_Prem*Dum*Ret***	**-0.086****	**-0.106****	**0.129**	**-0.121*****	**0.053**	**-0.104****	**-0.062**
		(-2.196)	**(-2.412)**	**(1.095)**	**(-2.700)**	**(0.592)**	**(-2.143)**	**(-0.982)**
β_8	*Size*	0.004**	0.007**	-0.002	0.008**	-0.001	0.011*	-0.001
		(1.992)	(1.965)	(-1.132)	(2.180)	(-0.387)	(1.753)	(-0.255)
β_9	*Size*Dum*	-0.004	-0.008	-0.007	-0.004	-0.012**	-0.030***	0.010
		(-1.009)	(-1.377)	(-1.329)	(-0.690)	(-2.332)	(-3.121)	(1.195)
β_{10}	*Size*Ret*	-0.004	-0.008	-0.005	-0.006	-0.009***	-0.016*	0.003
		(-1.578)	(-1.643)	(-1.489)	(-1.213)	(-2.627)	(-1.959)	(0.679)
β_{11}	*Size*Dum*Ret*	-0.038***	-0.034***	-0.047***	-0.033***	-0.041***	-0.036**	-0.062***
		(-4.764)	(-3.152)	(-2.779)	(-3.199)	(-2.643)	(-2.104)	(-3.903)
β_{12}	*MTB*	-0.010***	-0.013***	-0.003**	-0.012***	-0.005***	-0.024***	-0.007***
		(-6.994)	(-6.386)	(-2.299)	(-5.898)	(-2.871)	(-5.847)	(-5.014)
β_{13}	*MTB*Dum*	-0.002	0.001	-0.000	-0.000	0.003	0.003	-0.003
		(-1.519)	(0.346)	(-0.073)	(-0.272)	(0.765)	(1.175)	(-1.622)
β_{14}	*MTB*Rey*	0.002	0.003	-0.001	0.002	0.001	0.008	0.001
		(0.841)	(1.023)	(-0.290)	(0.673)	(0.357)	(1.371)	(0.383)
β_{15}	*MTB*Dum*Ret*	-0.005	-0.010	-0.019	-0.009	-0.027**	-0.023**	-0.003
		(-0.785)	(-1.246)	(-1.582)	(-1.124)	(-2.342)	(-2.489)	(-0.321)
β_{16}	*Leverage*	-0.022	0.031	-0.053**	0.006	-0.033	-0.009	-0.032
		(-1.038)	(0.853)	(-2.294)	(0.168)	(-1.324)	(-0.265)	(-1.192)
β_{17}	*Leverage*Dum*	0.055	0.016	0.035	0.038	-0.015	0.044	0.032
		(1.225)	(0.256)	(0.703)	(0.631)	(-0.248)	(0.759)	(0.512)
β_{18}	*Leverage*Ret*	0.043	0.022	0.046	0.030	0.056	0.035	0.048
		(1.398)	(0.418)	(1.264)	(0.631)	(1.369)	(0.677)	(1.342)
β_{19}	*Leverage*Dum*Ret*	0.075	0.168	0.053	0.078	0.381**	0.041	0.156
		(0.959)	(1.597)	(0.396)	(0.825)	(2.417)	(0.352)	(1.525)
N		6,135	3,073	3,062	3,069	3,066	3,072	3,063
R-squared		0.173	0.152	0.153	0.142	0.164	0.204	0.149

This table presents the results of additional analyses aimed to mitigate concerns about endogeneity. It presents the results of testing hypotheses using an augmented version of Eq. (4) and using the earnings-based Basu (1997) measure conservatism. *r_Prem* is the unexplained part (residuals) of the takeover premium. Residuals are obtained from estimating Eq. (1) as a first-stage regression using *Premium* that is calculated as the ratio of the share price offered by the acquirer to the target's closing share price four weeks prior to the deal announcement date, as reported by Thomson Reuters Eikon, minus one. Residuals, *r_Prem*, are then interacted with the earnings-based Basu (1997) conservatism measure in a second-stage regression for testing hypotheses (Eq. (12)). This table reports the results for the second-stage regression examining the association between the target's conservatism and takeover premiums (H_1) as well as the cross-sectional differences of the impact of the target's conservatism on the takeover premium by splitting the full sample into two subsamples based on the level of the target's ex ante asymmetric information (H2). Earnings, returns and firm-specific characteristics (size, MTB, and leverage) are winsorised at the 1% and 99% to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.8.5 The incremental effect of target's conservatism over target's ex ante information asymmetry

Prior studies show that the target's asymmetric information influences the takeover premium and shareholders abnormal returns around the acquisition announcement date (e.g., Officer et al., 2009; Dionne et al., 2015; McNichols & Stubben, 2015). Specifically, prior studies show that acquirers incur larger premiums when the target firm has higher asymmetric information during the period prior to the acquisition announcement. To increase the confidence in the results, the target's asymmetric information is controlled for in the first-stage regression in order to first test whether its expected positive association with takeover premium holds using the sample of this study and second to exclude its potential confounding effect on the association between targets' conservative accounting and takeover premium. Therefore, in the second-stage regression, the incremental effect of targets' conservative accounting, after controlling for targets' asymmetric information in the first-stage regression, on takeover premium is examined. Two alternative proxies for the target's asymmetric information are used in the first-stage regression and, therefore, subsequent analyses: the target's idiosyncratic stock return volatility and bid-ask spread. The target's idiosyncratic stock return volatility, *Tar_Vol*, is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. The target's bid-ask spread, *Tar_BidAsk* is estimated as the target's daily bid-ask spread between the CRSP bid (low) and ask (high) scaled by the spread midpoint, averaged across one year ending three months prior to the deal announcement date (i.e., the trading-day window: -317, -64).[37]

Consistent with predictions of this study, the results of the first-stage regression (reported in Panel A of Table 4.12) show that the target's ex ante asymmetric information is positively associated with the takeover premium whether the target's stock return

[37] In empirical analyses, this study treats proxies of the target's asymmetric information as exogenous factors for the takeover characteristics and dynamics. That is, this study estimates both the target's idiosyncratic stock return volatility as well as the target's bid-ask spread over a period ending three calendar months prior to the deal announcement date (i.e., the trading-day window [-263, -64] for stock return volatility and [-317, -64] for bid-ask spread) that is sufficiently removed from any potential changes in the target's abnormal returns during the period before the deal announcement date. This is in line with Schwert (1996) who shows that the rise in the target's stock price starts around -42 trading days prior to the deal announcement date (day 0) and that no information about the deal is probable to be available prior to the trading day -63.

volatility (column 1) or bid-ask spread (column 2) is used. The results are statistically significant at the 1% level. These results are consistent with prior studies suggesting that targets' high uncertainty arising from asymmetric information might increase the divergence between potential acquirers and make acquirers overestimate the true value of targets and ultimately offer larger premiums, i.e., the winner's curse (e.g., Varaiya, 1988; McNichols & Stubben, 2015; Brander & Egan, 2017).

Panel B of Table 4.10 presents the results for estimating second-stage regressions after controlling for the target's ex ante asymmetric information using stock return volatility and the use of the earnings-based Basu (1997) measure of conservatism. The results show that the association between the target's conservative accounting and residuals of the takeover premium is significantly negative after controlling for the target's asymmetric information, by including the target's stock return volatility or bid-ask spread in the first-stage regression. Moreover, the results of splitting the full sample based on the target's asymmetric information show that the negative association between the target's conservatism and residuals of the takeover premium is more prominent when the target's asymmetric information is high. Therefore, the results support those reported in the main analysis and suggest that the negative association between the target's conservative accounting and the takeover premium holds after controlling for the potential confounding effect of the target's ex ante asymmetric information.

Table 4.12
The incremental effect of target's conservatism over target's ex ante information asymmetry

Panel A: First-stage regressions: Y = $Premium_{i,t}$

Variables	*AsymInf = Tar_Vol*	*AsymInf = Tar_BidAsk*
Intercept	0.657**	0.706**
	(2.359)	(2.531)
Tar_Size	-0.044***	-0.050***
	(-5.375)	(-6.321)
Tar_MTB	-0.004	-0.003
	(-1.012)	(-0.893)
Tar_Lev	0.053	0.054
	(0.856)	(0.878)
Tar_ROE	0.034	0.026
	(0.968)	(0.728)
AsymInf	**3.518*** **	**1.840*** **
	(3.768)	**(2.845)**
Acq_Size	0.024***	0.025***
	(3.579)	(3.692)
Acq_MTB	0.009**	0.009**
	(2.078)	(2.118)
Acq_Lev	-0.105	-0.106
	(-1.597)	(-1.625)

Acq_ROE	0.027	0.026
	(0.428)	(0.413)
Tender	0.033	0.032
	(1.244)	(1.189)
Competition	0.161***	0.168***
	(3.441)	(3.568)
Hostile	0.203**	0.208**
	(2.080)	(1.971)
Cash	0.019	0.017
	(0.796)	(0.719)
Stock	-0.018	-0.019
	(-0.838)	(-0.881)
SameInd	-0.011	-0.012
	(-0.571)	(-0.624)
Year FE	Included	Included
Industry FE	Included	Included
N	1,434	1,434
R-squared	0.211	0.204

Panel B: Second-stage regressions: Y= *Earnings*

Coeff.	Variables	H1	H2					
			Tar_Vol		Tar_BidAsk		Tar_Size	
			High	Low	High	Low	Small	Large
β_0	*Intercept*	0.061***	0.040***	0.062***	0.033***	0.064***	0.060***	0.061***
		(19.652)	(7.011)	(21.701)	(5.928)	(21.732)	(11.379)	(16.736)
β_1	*Dum*	0.000	-0.000	0.011**	-0.004	0.013**	0.001	-0.003
		(0.098)	(-0.025)	(2.038)	(-0.513)	(2.491)	(0.174)	(-0.599)
β_2	*Ret*	0.003	-0.003	0.054***	0.002	0.060***	0.010	-0.001
		(0.418)	(-0.291)	(6.740)	(0.170)	(7.192)	(0.890)	(-0.148)
β_3	*Dum*Ret*	0.202***	0.182***	0.128***	0.166***	0.106***	0.214***	0.162***
		(15.309)	(10.859)	(5.048)	(9.982)	(4.066)	(11.408)	(8.487)
β_4	*r_Prem*	0.004	-0.007	0.036**	-0.013	0.034**	0.010	-0.004
		(0.244)	(-0.374)	(1.987)	(-0.616)	(2.251)	(0.492)	(-0.236)
β_5	*r_Prem*Dum*	-0.009	-0.004	-0.003	-0.013	0.012	-0.016	-0.003
		(-0.445)	(-0.149)	(-0.108)	(-0.500)	(0.450)	(-0.595)	(-0.126)
β_6	*r_Prem*Ret*	0.042*	0.054*	-0.008	0.054*	0.003	0.069**	0.003
		(1.672)	(1.959)	(-0.175)	(1.914)	(0.088)	(2.051)	(0.071)
β_7	***r_Prem*Dum*Ret***	**-0.094****	**-0.123*****	**0.086**	**-0.142*****	**0.038**	**-0.112****	**-0.099**
		(-2.201)	**(-2.619)**	**(0.679)**	**(-2.947)**	**(0.373)**	**(-2.088)**	**(-1.457)**
N		6,168	3,083	3,085	3,080	3,088	3,083	3,085
R-squared		0.119	0.092	0.120	0.088	0.120	0.138	0.084

This table reports the results for testing hypotheses with controlling for the target's ex ante asymmetric information. Panel A presents first-stage regressions (Eq. (1)) with incorporating the target's stock return volatility (column 1) or bid-ask spread (column 2) amongst control variables. Panel B shows the results for second-stage regressions using the earnings-based Basu (1997) to measure conservatism and controlling for the target's stock return volatility in the first-stage regression. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by both year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels at 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.8.6 Using a larger sample

In the main analyses, this study uses a sample of 1,434 deals completed over the period 1/1/1986 – 31/12/2017. Among the criteria for selecting this sample is to have available financial data on Compustat for both the target and acquiring firms so that the study can control for firm-specific characteristics of the deal participants. It is noticed that a large number of deals are excluded because of missing data for acquiring firms. Therefore, as the focus of this study is on the target's reporting characteristics, i.e., conservative accounting, rather than characteristics of the acquiring firm and to maximise the sample size, this study relaxes the restriction that the acquiring firm involved in the deal must have data on Compustat to be included in the analysis. In other words, in the first stage of analyses, the study does not add controls for acquiring firm-specific characteristics. This leads to having a larger sample that consists of 2,652 deals (i.e., an increase in the main sample size by more than 1,200 deals).

In the first stage, this study estimates the following OLS regression, which does not include controls for acquiring-firm specific characteristics, in order to obtain a clean measure of the takeover premium (unexplained or residual premium):

$$\begin{aligned} Premium_{i,t} = {} & \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} \\ & + \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Tender_{i,t} + \alpha_6 Competition_{i,t} \\ & + \alpha_7 Hostile_{i,t} + \alpha_8 Cash_{i,t} + \alpha_9 Stock_{i,t} + \alpha_{10} SameInd_{i,t} \\ & + \mu_n \, Year\ dummies + \lambda_n \, Industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (13)$$

Then in the second stage, residuals of the takeover premium are interacted with all explanatory variables of the earnings-based Basu (1997) measure as follows:

$$\begin{aligned} Earn_{i,t-z}/MV_{i,t-z-1} & \\ = {} & \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\ & + \beta_4 r\_Prem_{i,t} + \beta_5 r\_Prem_{\ i.t} * Dum_{i,t-z} + \beta_6 r\_Prem_{\ i.t} \\ & * Ret_{i,t-z} + \boldsymbol{\beta_7 r\_Prem_{\ i.t} * Dum_{i,t-z} * Ret_{i,t-z}} + \varepsilon_{i,t-z} \end{aligned} \quad (14)$$

Table 4.13 reports the results of using the larger sample of 2,652 deals (corresponding to 10,426 firm-years). Panel A presents the results of estimating Eq. (13), while Panel B reports the results of estimating Eq. (14) to test hypotheses. Consistent with the main findings, the results of using a larger sample show that winning acquirers pay lower premiums when target firms conservatively report over the five fiscal years preceding the acquisition announcement date. Moreover, when splitting the full sample based on the level of the target's pre-acquisition information asymmetry, as proxied by stock return volatility, bid-ask spread, and firm size, the results show that the role of the target's accounting conservatism in decreasing the acquirer's potential overpayment is more pronounced when the target's pre-acquisition information asymmetry is higher.

Table 4.13
Using a larger sample

Panel A: First-stage regressions: Y = $Premium_{i,t}$	
Variables	
Intercept	0.845***
	(2.920)
Tar_Size	-0.043***
	(-8.419)
Tar_MTB	0.007**
	(2.070)
Tar_Lev	-0.042
	(-0.899)
Tar_ROE	-0.023
	(-0.882)
Tender	0.037
	(1.556)
Competition	0.211***
	(4.957)
Hostile	0.124
	(1.508)
Cash	0.030
	(1.436)
Stock	-0.000
	(-0.022)
SameInd	-0.004
	(-0.223)
Year FE	Included
Industry FE	Included
N	2,652
R-squared	0.144

Panel B: Second-stage regressions: Y= $Earn_{i,t-z}/MV_{i,t-z-1}$

Coeff.	Variables	H1	H2					
			Tar_Vol		Tar_BidAsk		Tar_Size	
			High	Low	High	Low	Small	Large
β_0	*Intercept*	0.064***	0.041***	0.070***	0.034***	0.070***	0.061***	0.066***
		(25.772)	(8.813)	(23.205)	(7.385)	(23.653)	(14.607)	(22.472)
β_1	*Dum*	-0.000	-0.005	0.008*	-0.006	0.010**	-0.002	-0.003
		(-0.051)	(-0.831)	(1.794)	(-0.894)	(2.144)	(-0.380)	(-0.605)
β_2	*Ret*	0.007	0.006	0.041***	0.007	0.056***	0.017*	-0.001
		(1.183)	(0.857)	(4.252)	(1.033)	(5.902)	(1.921)	(-0.176)
β_3	*Dum*Ret*	0.213***	0.179***	0.154***	0.173***	0.113***	0.216***	0.174***
		(20.860)	(13.675)	(7.258)	(13.233)	(5.529)	(14.764)	(12.042)
β_4	*r_Prem*	0.008	-0.000	0.022*	-0.001	0.020**	0.008	0.008
		(0.840)	(-0.015)	(1.838)	(-0.071)	(1.983)	(0.621)	(0.598)
β_5	*r_Prem*Dum*	-0.020	-0.009	-0.017	-0.009	-0.011	-0.021	-0.017
		(-1.423)	(-0.476)	(-0.726)	(-0.469)	(-0.472)	(-1.078)	(-0.922)
β_6	*r_Prem*Ret*	0.013	0.018	0.023	0.018	0.027	0.031	-0.014
		(0.721)	(0.961)	(0.599)	(0.946)	(0.955)	(1.246)	(-0.626)
$\boldsymbol{\beta_7}$	***r_Prem*Dum*Ret***	**-0.070****	**-0.077****	**-0.017**	**-0.078****	**-0.024**	**-0.092****	**-0.035**
		(-2.450)	**(-2.428)**	**(-0.200)**	**(-2.467)**	**(-0.287)**	**(-2.436)**	**(-0.791)**
N		10,426	5,211	5,215	5,212	5,214	5,213	5,213
R-squared		0.130	0.102	0.111	0.098	0.115	0.150	0.086

This table reports the results for testing hypotheses using a larger sample of M&A deals (2,652 deals). Panel A presents the results of the first-stage regression (Eq. (13)). Panel B shows the results for second-stage regressions using the earnings-based Basu (1997) to measure conservatism (Eq. (14)). *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by both year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively. Variable definitions are provided in Table 4.1.

4.9 Summary

Prior studies show that conservative accounting plays a vital role in both equity and debt markets. This study extends prior studies by examining whether and how conservative accounting influences bidding strategies of participants in the market for corporate control. The winner's curse predicts that the acquirer who wins a contest to control an auctioned asset is the one who most excessively overestimates the value of this asset. In addition, the probability of the winner's curse incidence and its magnitude increase with the increase in the uncertainty about the true value of the asset. Relatedly, high uncertainty about the value of an asset would increase the divergence of opinions among bidders about the true value of this asset and, in turn, increase the winner's curse. Based on the winner's curse and divergence of opinions explanations of the overpayment in M&As market, this study predicts that conservative accounting of target firms helps acquirers to effectively bid in the market for corporate control. Specifically, this study examines whether the target's conservative accounting helps the winning acquirer to avoid overpayment by offering lower premiums to target shareholders through mitigating the

adverse consequences of uncertainty about the target's value. In addition, the study expects this role of the target's conservative accounting to be more pronounced in M&A transactions involving targets with high levels of ex ante (pre-merger) uncertainty.

Using a sample of completed M&A deals between U.S. companies announced over the period 1986-2017, the results show a significant negative association between the target's conservative accounting and the takeover premium offered by the winning acquirer to target shareholders. This suggests that conservative accounting of target firms helps bidders to bid more effectively and avoid overpayment in the market for corporate control. The results also demonstrate that the negative association between the target's conservative accounting and the takeover premium is more pronounced in deals involving targets with high ex ante information asymmetry, as proxied by high targets' idiosyncratic stock return volatility, high bid-ask spread, or small target size, suggesting that conservative accounting helps mitigate the adverse effects of uncertainty about the target's value confronting bidders in this market.

The results are robust to several sensitivity tests. Specifically, the results are insensitive to the use of two different specifications of the takeover premium. Second, as this study uses a two-stage approach in testing hypotheses in main analyses in order to control for the effect of confounding variables, a one-stage approach is used in robustness checks to mitigate concerns about the effect of using residuals on inferences (Chen et al., 2018b; Christodoulou et al., 2018) and consistent results are obtained. Third, the results are generally consistent when using two alternative measures of the target's conservative accounting that are based on Ball and Shivakumar (2005) and Khan and Watts (2009). Fourth, the results are robust after considering concerns about endogeneity arising from potential correlated omitted variables. Fifth, the results are similar after controlling for the target's ex ante asymmetric information, suggesting the incremental effect of the target's conservative accounting on the takeover premium.

Accordingly, the results suggest that conservative accounting has a governance role in the market for corporate control by helping bidders to effectively bid and more precisely value target firms and, in turn, reduce the probability that the winning acquirer overpays for the target, i.e., the winner's curse. This is arguably achieved by mitigating the adverse effects of uncertainty about the target's value confronting bidders and, consequently, decreasing the divergence of opinions among bidders.

The results of this study have important implications by informing the debate on the benefits of conservative accounting and providing new evidence to the standard setters

of the informational and governance roles of conservative accounting in the market for corporate control. Therefore, this study moves forward the extant research on the economic consequences of conservative accounting. It also extends the growing research addressing the role of accounting quality of target firms in reducing uncertainty in the market for corporate control and its effects on M&A dynamics and outcomes.

However, the results of this study should be interpreted with several caveats in mind. First, although this study uses multiple measures to capture the target's conservative accounting, all measures of conservatism are vulnerable to measurement errors. Therefore, inferences should be considered with respect to the extent to which these measures accurately capture conservative accounting. Second, this study has considered the endogenous nature of conservative accounting by using different specifications of measures of conservatism or by controlling for firm-specific characteristics; however, endogeneity concerns cannot be completely ruled out. Third, this study uses a sample of M&A deals between U.S. public companies and does not consider other deals in other settings such as deals including either private targets or acquirers or deals between companies in different countries that might limit the generalisability of the results.

Chapter 5

Accounting conservatism of target firms and stock market reaction to M&A announcements

5.1 Introduction

Prior literature shows that accounting conservatism plays a beneficial role for users in both the debt and equity markets (e.g., Ahmed et al., 2002; LaFond & Watts, 2008; Wittenberg-Moerman, 2008; Zhang, 2008; Nikolaev, 2010; Kim et al., 2013; García Lara et al., 2014; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017; Kang et al., 2017). However, only limited evidence examines the role that accounting conservatism plays in the mergers and acquisitions market. Two exceptions are Francis and Martin (2010) and Kravet (2014). Francis and Martin (2010) find that bidding firms with higher levels of accounting conservatism make more profitable acquisition decisions. Kravet (2014) shows that bidders with more conservative reporting make less risky acquisitions and that this effect is more pronounced when bidders have accounting-based debt covenants. Nonetheless, Francis and Martin (2010) and Kravet (2014) only focus on accounting conservatism of bidding firms. This study, however, investigate the impact of accounting conservatism of the target firm on shareholder wealth in M&A deals.

Specifically, this study examines whether accounting conservatism of target firms is associated with shareholder wealth of both the target and acquiring firms, as reflected by the stock market reaction to the announcement of M&A deals. Prior studies argue that accounting conservatism increases the credibility of accounting information by constraining managers' incentives and abilities to overestimate unverifiable future gains and/or underestimate unverifiable future losses and, therefore, making information provided by a conservative accounting system "hard" (Watts, 2003a). It is also argued that conservatism alleviates the risk of the insider's adverse selection arising from information asymmetry by eliciting information about potential losses that would arguably be reliable and allowing the recognition of only verifiable gains in financial statements (Watts, 2003a; 2006; LaFond & Watts, 2008). Furthermore, prior studies argue and provide evidence that "hard" information provided by a conservative

accounting system disciplines other sources of "soft" information such as management and financial analysts (Watts, 2003a; Hui et al., 2009; D'Augusta, 2018; D'Augusta & DeAngelis, Forthcoming). In this study, I argue that accounting conservatism of target firms improves the information environment and alleviates the negative consequences of information asymmetry of target firms and, consequently, associates with the stock market reactions of both the target and acquiring firms upon the announcement of M&A deals.

This study, therefore, conjectures that accounting conservatism of target firms helps bidders in the takeover market to effectively bid and accurately estimate the true value of target firms and, thus, avoid overpayment to target shareholders. As target shareholders prefer to receive higher premiums in M&A deals, the argued effect of targets' accounting conservatism on mitigating bidders' overpayment in the M&A market is expected to be negatively perceived by target shareholders. In other words, the target's accounting conservatism is expected to decrease the positive market reaction by target shareholders to the announcement of M&A deal. Accordingly, this study firstly hypothesises that the target's conservative accounting is negatively associated with target returns. In contrast, while avoiding overpayment by the winning acquirer is expected to be negatively perceived by target shareholders, it is expected to be positively perceived by acquirer shareholders. Thus, this study conjectures that the target's accounting conservatism is positively associated with acquirer returns.[38]

Following prior research, this study uses the original Basu (1997) model, which is based on earnings, and the modified Basu (1997) model, which is based on accruals and suggested by Collins et al. (2014), as the primary measures of accounting conservatism in the main analysis. This study employs the market model to estimate target and acquirer returns. Following Nikolaev (2010) and Kravet (2014), this study employs

[38] This study examines the association between the target's conservative accounting and the market rection to the announcement of M&A transactions. Therefore, this study is considered to contribute to the Market-Based Accounting Research (MBAR) addressing the relationship between capital markets and financial statement information. MBAR is defined by Lev and Ohlson (1982:249) as "the search into the relationship between publicly disclosed accounting information and the consequences of the use of this information by the major group of users - equity investors - as such consequences are reflected in characteristics of common stocks traded in major exchanges". MBAR began in the late 1960s following the introduction of the efficient market hypothesis and the event study methodology. The efficient market hypothesis assumes that security prices reflect all publicly available information. Different forms of the market efficiency (strong, semi-strong, and weak) relate to the extent of rapidity and accuracy of price adjustment to new information. The extent to which the market is efficient influences the demand for MBAR (Lee, 2001). Watts (1992) argues that accounting choice affects tests of the relationships between accounting information and stock prices as accounting choice varies with firm variables such as growth, gearing, etc. As accounting conservatism incorporates the use of accounting choice by accountants and standard-setters, I predict that the market differently reacts to corporate events when different levels of accounting conservatism are adopted by firms.

a two-stage approach to control for the potential confounding effect of several factors on target and acquirer returns. In the first stage, target or acquirer returns, measured as the cumulative abnormal returns around the announcement of M&A deals, are regressed on a vector of control variables that might affect shareholders' wealth. These variables include target firm-specific characteristics, acquirer firm-specific characteristics, and deal-specific characteristics. The residuals of first-stage regressions, which represent the unexplained parts of target or acquirer returns, are used as clean measures of target or acquirer returns. In the second stage, the residuals of first stage regressions are interacted with variables of the two versions of Basu (1997) model to test the association between accounting conservatism and target or acquirer returns.

Using a large sample of M&A deals completed between the U.S. public firms and announced over the period from 1 January 1986 to 31 December 2017, the results support the predictions of this study that accounting conservatism of target firms is negatively associated with the cumulative abnormal returns for target shareholders around the M&A deal announcement date. This suggests that target returns will be lower when the target firm adopts more conservative reporting practices over the years preceding the acquisition. The results also show that the target's accounting conservatism is positively associated with cumulative abnormal returns for shareholders of the winning acquirer around the deal announcement date, suggesting that announcement returns for the winning acquirer's shareholders will be higher when the target's financial reporting is more conservative. These results are consistent with the prediction that when the winning acquirer avoids overpayment, the reaction of shareholders of the target and acquirer will vary. That is, while paying less may be negatively perceived by target shareholders, it may be positively perceived by the winning acquirer's shareholders. Therefore, this study provides evidence on the informational role of accounting conservatism of the target firm in M&As. It also supports the evidence that better information environment of the target firm helps bidders to bid more effectively and avoid overestimating the target's value and, consequently, overpaying for target shareholders.

The results are robust to several sensitivity checks. First, this study uses Ball and Shivakumar (2005) and Khan and Watts (2009) models as alternative measures of accounting conservatism and the inferences are the same when these measures are used. Second, the results are robust when the market-adjusted model is used instead of the market model to estimate target and acquirer returns. Third, the results are similar when using the standard one-stage regression approach. Therefore, the results are not expected

to be a matter of using a particular measure or a specific methodology. Forth, the results are robust to adding additional control variables that count for the potential endogeneity arising from omitted correlated variables. Finally, the inferences do not change when controlling for targets' ex ante information asymmetry.

This study contributes to the literature in two main ways. First, while prior literature has documented the benefits of accounting conservatism for users in the debt market (e.g., Ahmed et al., 2002; Wittenberg-Moerman, 2008; Zhang, 2008; Nikolaev, 2010; Kang et al., 2017) as well as the equity market (e.g., LaFond & Watts, 2008; Kim et al., 2013; García Lara et al., 2014; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017), very little is known about the informational role of conservatism for users in the M&A market. Therefore, this study fills this void in the literature and contributes to the ongoing debate on benefits and costs of accounting conservatism by providing evidence that accounting conservatism is associated with shareholders' wealth of the merging firms.[39]

Second, this study contributes to an emerging research stream that addresses the role of accounting quality of target firms in the mergers and acquisitions market. Although prior studies show that accounting quality of target firms affects decisions of acquiring firms and deal performance (e.g., Raman et al., 2013; Skaife & Wangerin, 2013; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Martin & Shalev, 2017), these studies focus on general measures of accounting quality such as earnings quality and aggregated scores of accounting quality. However, it is not clear the role that individual qualitative characteristic of accounting quality might play in shaping participants' decisions and, therefore, shareholders' wealth in the M&A market. This study adds to this research stream by addressing the informational role of accounting conservatism of target firms in mergers and acquisitions and providing evidence that target-firm conservatism is associated with shareholders' wealth of both the target and the acquirer.

[39] Both FASB and IASB have been making changes in accounting standards that promote the movement toward the application of a mark-to-market accounting system (Allen & Carletti, 2008). There is a controversy over the benefits and costs of adopting a mark-to-market accounting system. Proponents of this method argue that it enables accounting information to reflect the true values of assets and, therefore, enables investors and other users to make better decisions. On the other hand, opponents argue that this method makes asset prices excessively volatile and, therefore, accounting information would reflect the market's short-term fluctuations rather than the fundamental values of assets and liabilities. According to Mark-to-market accounting system, accounting information more timely reflects both economic gains and losses. However, accounting conservatism incorporates the implementation of asymmetric verification levels when recognising economic gains and losses. Therefore, this study highlights the economic effects of accounting conservatism of U.S. target firms on M&A outcomes, as conservatism might be viewed as a contradicting accounting principle for mark-to-market accounting system.

The remainder of this chapter proceeds as follows: section two reviews the literature and develops the hypotheses. Section three demonstrates the research design, including the measurement of variables and empirical models. The sample and descriptive statistics are presented in section four. Empirical results and sensitivity analyses are reported in sections five and six, respectively. Section seven concludes.

5.2 Literature review

An emerging stream of research addresses whether the quality of financial reporting of target firms can mitigate information uncertainty about the true value of target firms and, consequently, influence bidders' decisions and shareholders' wealth of target and bidding firms (e.g., Raman et al., 2013; Skaife & Wangerin, 2013; Marquardt & Zur, 2015; McNichols & Stubben, 2015; Martin & Shalev, 2017; Chen et al., 2018a). For instance, by constructing a score of the quality of financial reporting that aggregates discretionary accruals, internal control quality, off-balance sheet liabilities, the accuracy of analyst forecasts and dispersion of analyst forecasts, Skaife and Wangerin (2013) find that target firms with lower scores of financial reporting quality are offered with higher premiums. They also report that deals involving target firms with lower scores of financial reporting quality are more likely to be terminated and, if completed, they are more likely to be renegotiated in order to reduce purchase prices. Further, they show that target firms of terminated deals are more likely to subsequently restate their financial statements.

The findings of Skaife and Wangerin (2013) might suggest that the low financial reporting quality of the target firm reflects information uncertainty about the target's true value and, hence, increases the likelihood of the bidder's overpayment to target shareholders. In addition, bidders' access to some private information of the target firm during the transactional due diligence after the acquisition announcement can help bidders to figure out the extent of the reliability and the representational faithfulness of financial reports and, accordingly, renegotiate the deal conditions.

Raman et al. (2013) examine whether earnings quality of the target firm affects the bidder's decisions regarding the takeover strategy, premium and method of payment. They find that deals involving target firms with low earnings quality are more likely to be negotiated rather than to be hostile. They argue that the bidder prefers to friendly negotiate the deal with the target's management and, hence, gets access to private information, when earnings quality of the target firm is low. That is, by negotiating the

deal, the bidder can mitigate the negative effects of information uncertainty arising from the low earnings quality. They also show that target firms with low earnings quality receive higher premiums in negotiated deals. Further, they find that using stock in deal payment is greater when the quality of targets' financial reporting is lower, consistent with the Hansen's (1987) prediction of using stock in alleviating the adverse consequences of targets' information asymmetry.

McNichols and Stubben (2015) focus on the effect of earnings quality of target firms on returns for shareholders of both the bidder and the target. They report a negative effect of information uncertainty about the target firm value on abnormal returns around acquisition announcements for bidder shareholders. Further, they show that bidder (target) returns are positively (negatively) associated with earnings quality of the target firm, suggesting that earnings quality of the target firm helps bidders to bid more effectively and accurately value the target firm.

Other studies address the role that auditors can play in the M&A market. Based on a sample of public U.S. M&A deals between 1987 and 2006, Xie et al. (2013) find that firms audited by Big N auditors are more likely to be targeted in M&A deals and that, conditioning on being targeted, deals involving targets audited by Big N auditors have higher deal completion rates. They also show that these results are more pronounced when targets have greater levels of information risk, as proxied by low levels of accruals quality. Therefore, they assure the important role audit quality, as proxied by Big N auditors, plays in M&A deals by signalling for the high levels of targets' accounting information quality.

Cai et al. (2016) examine whether sharing the same auditor by both the target and the acquirer enhances the acquisition quality, as measured by the combined returns for target and acquirer shareholders around the acquisition announcement date. They report that sharing the same auditor by the target and the acquirer positively affects the combined returns around the acquisition announcement date. They also find that this effect is more pronounced when pre-acquisition targets' uncertainty is higher, suggesting that common auditors play an informational intermediary role in M&A deals. They provide evidence supporting three channels through which common auditors can enhance the quality of M&A deals. First, they argue that common auditors facilitate discussions between acquisition parties. That is, they find a stronger impact of common auditors on the acquisition quality when both the target and the acquirer are audited by the common-auditor's same local office. In addition, the probability of M&A is higher for firms with

common auditors. Second, they find higher levels of financial statement comparability for targets and acquirers sharing the same auditor. Lastly, they find that merging firms audited by the same auditor have more reporting quality (less misreporting), as evidenced by having lower discretionary accruals and accounting restatements than merging firms having different auditors.

In the same vein, Dhaliwal et al. (2016) find that the likelihood that a firm becomes a target (i.e., receives a bid from another firm) increases when both the target and the acquirer share the same auditor. More importantly, they report that sharing the same auditor by the target and the acquirer has favourable implications for the acquirer at the expense of the target. Specifically, they find that M&A deals with shared auditors are more likely to have lower bid premiums, lower (higher) announcement returns for targets (acquirers), and greater rates of completion. In addition, they show that these results are more pronounced when deal parties share the same audit office of the shared auditor and when targets are smaller. Therefore, they suggest that bidders obtain a higher informational advantage from sharing the same auditors relative to target firms.

Although prior studies address the role that accounting quality of target firms can play in mergers and acquisitions, they focus on general measures of accounting quality such as accruals quality, aggregated scores of accounting quality, and audit quality. However, it is not clear the role that individual qualitative characteristics of accounting information might play in shaping participants' decisions and, therefore, shareholders' wealth in the M&A market.[40] Therefore, this study focuses on an important accounting characteristic that has been long debated among researchers, practitioners, and standard setters. In particular, this study investigates the association between accounting conservatism of target firms and shareholders' wealth of the target and the acquirer as reflected by the market reaction around the announcement of M&A deals.

5.3 Hypotheses development

Accounting conservatism represents a fundamental accounting principle that is dating back centuries (Basu, 1997). It has been viewed as a crucial convention in accounting that dictates the exercise of caution in recognising and measuring accounting numbers in

[40] One exception is Chen et al. (2018a) who provide evidence that accounting comparability of target firms can enhance the efficiency of mergers and acquisitions decisions, as measured by the combined returns for shareholders of the target and the acquirer, return on assets, and goodwill impairment.

financial reports (Givoly & Hayn, 2000). Prior literature mainly focuses on the role of accounting conservatism in helping users in the equity and/or debt markets. Several studies provide evidence that accounting conservatism helps users in the debt market to make better decisions by mitigating the negative consequences of information asymmetry between insiders and outsiders (e.g., Ahmed et al., 2002; Wittenberg-Moerman, 2008; Zhang, 2008; Nikolaev, 2010; Kang et al., 2017). For instance, Ahmed et al. (2002) show that the demand for accounting conservatism increases when agency costs arising from the conflict between debtholders and shareholders over dividend policy increase. They also find that conservatism helps firms to reduce the cost of debt. Zhang (2008) shows that accounting conservatism is beneficial for both borrowers and lenders. She finds that accounting conservatism benefits borrowers ex ante by reducing the debt interest rate. At the same time, conservatism helps lenders ex post by increasing the timely trigger of borrowers' debt covenants.[41]

Prior studies also provide evidence that accounting conservatism helps users in the equity market (e.g., LaFond & Watts, 2008; Kim et al., 2013; García Lara et al., 2014; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017). For instance, Kim et al. (2013) show that accounting conservatism alleviates the negative consequences of SEO announcements on stock returns. They find that firms with higher levels of conservatism experience lower negative abnormal returns during the SEO announcements relative to firms with lower levels of conservatism. Kim and Zhang (2016) find that conditionally conservative accounting reduces the occurrence likelihood of future stock crashes, arguing that conservatism helps mitigate managers' incentives, tendencies, and abilities to withhold bad news. They also find this role of conservatism to be more pronounced when firms have higher information asymmetry. Further, Goh et al. (2017) argue that conservatism plays a stronger role in reducing asymmetric information between the firm and its shareholders than that between the firm and its debtholders. That is, they find that the likelihood of choosing equity financing, compared to debt financing, increases in firms having greater degrees of conditional conservatism.

There are two notable studies that address the effect of accounting conservatism in the M&A market. First, Francis and Martin (2010) find that bidding firms with higher levels of accounting conservatism make more profitable acquisition decisions, as proxied by abnormal returns around the announcement of acquisitions for bidders' shareholders

[41] See Penalva and Wagenhofer (2019) for a review of the theory and empirical evidence of the role of accounting conservatism in the debt contracting process.

and the improvement in operating performance after the deal completion. They also find that bidders having high levels of conservatism are less likely to divest the previously acquired firms over the post-acquisition 7-year window. Further, they show that the effect of bidders' conservatism on acquisition profitability is more pronounced when bidders' pre-acquisition agency costs are severe.

Kravet (2014) investigates the association between bidders' conservatism and the investment risk in the mergers and acquisitions context. Consistent with the argument that conservatism prompts the recognition of losses of negative net present value projects (Watts, 2003a; Ball & Shivakumar, 2005), Kravet (2014) reports that bidders with more conservative reporting practices make less risky acquisitions. Moreover, he finds that the effect of bidders' conservatism on acquisition risk is more pronounced when bidders have accounting-based debt covenants, consistent with the conservatism decreasing-effect of managers' incentives to make very risky investments that might result in large losses and, in turn, trigger debt covenants.

Although Francis and Martin (2010) and Kravet (2014) examine the impact of accounting conservatism in the M&A market, they only focus on accounting conservatism of the bidding firm. However, no study, to the best of the author's knowledge, investigates the informational role of accounting conservatism of the *target firm* in mergers and acquisitions. Therefore, this study aims to fill this void by examining the effect of target-firm conservative reporting on shareholders' wealth in M&As as reflected in target and acquirer shareholders' responses to the announcement of M&A deals. In particular, this study predicts that accounting conservatism of target firms can reduce information uncertainty about the true value of target firms and, therefore, help bidders to bid more effectively in the M&A market and avoid potential overpayment to target shareholders. This would, in turn, affect the market reaction to the announcement of M&A deals.

In this study, I argue that accounting conservatism of target firms improves their information environment, and, in turn, influences the market reaction of both the target and the acquirer to the announcement of M&A deals. This argument relies on three premises. First, Watts (2003a; 2003b) argues that accounting conservatism increases the credibility of accounting information by constraining managers' incentives to overestimate unverifiable future gains or underestimate unverifiable future losses and, therefore, making information accounting provides on current performance "hard". That is, accounting conservatism imposes asymmetric verification requirements for

recognising future gains and losses. In particular, conservatism entails stronger verification requirements to recognise unverifiable future gains but lower verification requirements to recognise unverifiable future losses.

Second, when target firms have higher degrees of conservative accounting, the risk of any potential adverse selection by target managers arising from information asymmetry between target managers and acquirer managers would be lower. That is, asymmetric verification requirements for gains and losses of accounting conservatism offset managers' incentives and abilities to withhold bad information by eliciting information about potential losses that would arguably be reliable and allowing the recognition of only verifiable gains in financial statements (Watts, 2003a; 2006; LaFond & Watts, 2008). Prior empirical evidence hugely supports this argument in both the debt and equity markets (e.g., Ahmed et al., 2002; Zhang, 2008; Francis et al., 2013; Kim et al., 2013; D'Augusta et al., 2016; Kim & Zhang, 2016; Goh et al., 2017).

Third, Watts (2003a; 2003b) argues that accounting conservatism can play a disciplining role for other sources of "soft" information such as managers and financial analysts. That is, "hard" information provided by a conservative accounting system would represent a benchmark for other sources of information. In addition, "hard" information can help investors to assess the accuracy and reliability of predictions provided by different "soft" information sources. Several studies provide empirical evidence supporting the disciplining role of accounting conservatism for other sources of "soft" information. For instance, D'Augusta and DeAngelis (Forthcoming) find that accounting conservatism is negatively associated with upward tone management in the Management Discussion and Analysis (MD&A) section of the annual report, suggesting that conservatism constrains managers' incentives to manipulate voluntary disclosure. They also find that this role of conservatism is more prominent when managers' incentives for upward tone management is higher. D'Augusta (2018) finds that the initial positive market reaction to positive management forecasts is stronger while the subsequent market positive drift is lower when firms have higher levels of conservatism. Also, he finds that the initial negative market response to negative management forecasts is lower, the subsequent positive correction is lower, and the increase in uncertainty among investors is lower when firms have higher levels of conservatism. This suggests that accounting conservatism moderates the effect of management forecasts on market reaction through increasing the credibility of management forecasts.

Accordingly, this study predicts that accounting conservatism decreases the negative consequences of information asymmetry of target firms and, consequently, decreases target returns upon the announcement of M&A transactions. In particular, high information asymmetry of the target firm increases the uncertainty bidders confront when estimating the target's value (e.g., Hansen, 1987; Officer et al., 2009) that would, in turn, increase the divergence of opinion among bidders in the takeover market. Thus, high uncertainty about the target value and the divergence of opinions among bidders would increase the likelihood that the winning bidder fills victim in the winner's curse by overpaying for target shareholders, which will be favourably perceived by target shareholders upon the announcement of M&A transactions (e.g., McNichols & Stubben, 2015). Therefore, as conservatism would decrease the effects of information asymmetry on the acquirer's overpayment, this study predicts that the target's conservative accounting will negatively associate with target returns, as measured by cumulative abnormal returns for target shareholders around the announcement of acquisitions. Formally stated, the first hypothesis is:

> **Hypothesis 1:** Targets' conservative accounting is negatively associated with targets' abnormal returns around the announcement of M&A deals

On the other hand, overpayment by the winning acquirer due to the high uncertainty of the target's value will be negatively perceived by acquirer shareholders. Prior studies show that high uncertainty of target firms negatively influences takeover gains for acquirer shareholders (e.g., Officer et al., 2009; McNichols & Stubben, 2015). Thus, the potential rule of accounting conservatism in mitigating the adverse consequences of the target's information asymmetry would be positively perceived by acquirer shareholders. Accordingly, the second hypothesis predicts that targets' accounting conservatism is positively associated with cumulative abnormal returns around the acquisition announcement for acquirers' shareholders. The second hypothesis formally states that:

> **Hypothesis 2:** Targets' conservative accounting is positively associated with acquirers' abnormal returns around the announcement of M&A deals

5.4 Research design

5.4.1 Measurement of target's accounting conservatism

This study primarily measures conservative accounting of target firms using Basu (1997) asymmetric timeliness piece-wise model over the five fiscal years window ending before the deal announcement date. Two versions of Basu model are used: the original earnings-based Basu (1997) model and the modified accruals-based Basu model suggested by Collins et al. (2014). Specifically, the following Basu (1997) piece-wise model is estimated, using earnings or accruals as the dependent variable, and using a pooled cross-section time-series window of five fiscal years ending at the target's fiscal year-end preceding the acquisition announcement date:

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z} \quad (1)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. $Earn_{i,t-z}/MV_{i,t-z-1}$ is the target's net income before extraordinary items (Compustat item: *ib*) deflated by the lagged market value of equity (Compustat items: *prcc_f* csho*); $Acc_{i,t-z}/MV_{i,t-z-1}$ is the target's operating accruals as calculated by net income before extraordinary items (Compustat item: *ib*) minus cash flows from continuing operations (Compustat items: oancf – xidoc), deflated by lagged market value of equity (Compustat items: *prcc_f* csho*). $Ret_{i,t-z}$ is the target's market-adjusted annual stock return estimated by compounding monthly market-adjusted returns, including dividends, over the fiscal year (CRSP monthly stock file items: *ret*, adjusted by the value-weighted market return, *vwretd*). $Dum_{i,t-z}$ is a dummy variable that equals one if $Ret_{i,t-z}$ is negative, otherwise $Dum_{i,t-z}$ equals zero.

Basu (1997) uses a dummy variable for stock returns, $Dum_{i,t-z}$, to allow both the intercept and coefficients to vary across positive (or non-negative) and negative returns. Therefore, β_2 is a measure of earnings' timeliness of good news and the coefficient of the interaction term between $Ret_{i,t-z}$ and $Dum_{i,t-z}$, i.e., β_3, represents earnings' incremental timeliness of bad news (negative returns) relative to good news (non-negative returns), i.e., the measure of accounting conservatism. Accordingly, if firms conservatively report

their financial statements, it is expected that the coefficient of the interaction term between returns and the dummy variable of negative returns, β_3, to be positive in periods of bad news (i.e., negative returns). Therefore, higher values of $\boldsymbol{\beta_3}$ reflect higher degrees of accounting conservatism.

5.4.2 Estimating takeover gains using the market reaction around the M&A announcement date

Following a large body of research (e.g., Bradley et al., 1988; Cai et al., 2016; Martin & Shalev, 2017; Chen et al., 2018a), this study estimates takeover gains for shareholders of the target or the acquirer as the cumulative abnormal returns (CAR) for the target or the acquirer around the deal announcement date. As stock prices quickly reflect new information, including information about the expected values of corporate events such mergers and acquisitions, in the efficient capital market, using stock price abnormal reaction within a short-term event window around the deal announcement date would provide statistically reliable evidence of the value creation or destruction of M&A transactions (Andrade et al., 2001).

Therefore, this study estimates target (acquirer) returns as the cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns for the target or the acquirer are estimated using the market model and the CRSP value-weighted returns as the market index.[42] Parameters/Coefficients of the relation between firm returns and market returns are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. Specifically, the following least squares regression is estimated for each target or acquirer:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}, \text{ over the estimation window (t = -263, -64).}$$

Then, with the assumption that coefficients of the relation between firm returns and market returns are constant during both the estimation and event windows, normal

[42] In robustness checks, this study uses the market-adjusted model as an alternative method to estimate target and acquirer announcement returns.

returns during the event window (-1, +1) are estimated using the estimated coefficients of the market model and market returns during the event window as follows:

$$Normal\_R_{i,t} = \alpha_i + \beta_i R_{m,t}, \text{ over the event window (t = -1, +1).}$$

Next, deviations of actual returns from estimated normal returns during the event window are used as an estimation of abnormal returns as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - Normal\_R_{i,t}, \text{ over the event window (t = -1, +1).}$$

Last, for each target or acquirer, abnormal returns around the deal announcement date are cumulated over the event window (-1, +1) as follows:

$$TarRet_i \text{ or } AcqRet_i = \sum_{t=-1}^{1} Abnormal\_R_{i,t}$$

5.4.3 Estimating unexplained takeover gains

This study follows Nikolaev (2010) and Kravet (2014) and uses a two-stage approach to test the hypotheses. In the first stage, dependent variables ($TarRet_{i,t}$ and $AcqRet_{i,t}$) are regressed on a vector of control variables that might be associated with takeover gains and, therefore, confound the effect of target-firm conservative accounting on takeover gains. Then, in the second stage, residuals of first-stage regressions (i.e., unexplained takeover gains) are saved and interacted with the measures of conservatism in order to test hypotheses. The use of a two-stage approach helps provide clean results by controlling for many variables that might confound the effect of target-firm conservatism on takeover gains in the first stage and, therefore, helps reduce concerns about endogeneity arising from omitted correlated variables. In addition, using a two-stage approach helps reduce concerns about high multicollinearity arising from interacting many control variables with the Basu's variables in the standard one-stage approach.

Specifically, first-stage regressions undertaken to orthogonalise measures of takeover gains for target or acquiring firms are based on the following cross-section ordinary least square (OLS) regression model:

$$
\begin{aligned}
Dependent\_Var_{i,t} &= \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} \\
&+ \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Acq\_Size_{i,t-1} + \alpha_6 Acq\_MTB_{i,t-1} \\
&+ \alpha_7 Acq\_Lev_{i,t-1} + \alpha_8 Acq\_ROE_{i,t-1} + \alpha_9 Tender_{i,t} \\
&+ \alpha_{10} Competition_{i,t} + \alpha_{11} Hostile_{i,t} + \alpha_{12} Cash_{i,t} \\
&+ \alpha_{13} Stock_{i,t} + \alpha_{14} SameInd_{i,t} + \mu_n \, Year\ dummies \\
&+ \lambda_n \, Industry\ dummies + \varepsilon_{i,t} \qquad (2)
\end{aligned}
$$

where $Dependent\_Var_{i,t}$ represents $TarRet_{i,t}$ or $AcqRet_{i,t}$, t is the deal announcement year, and *t-1* is the fiscal year ending prior to the deal announcement date for the target or the acquirer.

The literature shows that several firm-specific characteristics of both the target and the acquirer, as well as deal characteristics affect takeover gains. Therefore, this study controls for many variables that might affect takeover gains. These variables could be classified into three categories: target characteristics, acquirer characteristics, and deal characteristics. As for the target and acquirer characteristics, this study controls for firm size (e.g., Schwert, 2000; Moeller et al., 2004; Alexandridis et al., 2013); market-to-book ratio (Dong et al., 2006), leverage (Maloney et al., 1993), and return on equity. Size is defined as the natural logarithm of the firm's market capitalisation. Market to book is calculated as the ratio of the firm's market value of equity to its book value of equity. Leverage is the ratio of the firm's total debt to its total assets. Return on equity is calculated as the ratio of the firm's income before extraordinary items to its book value of equity. Target and acquirer characteristics are all measured at the end of the target's or the acquirer's fiscal year preceding the deal announcement date.

This study also controls for deal characteristics found in the literature to affect takeover gains. Deal characteristics include the deal hostility (Schwert, 2000); competition between bidders over the target (e.g., Walkling & Edmister, 1985; Bradley et al., 1988); whether the deal is a tender offer (Offenberg & Pirinsky, 2015); the method of payment (e.g., Fuller et al., 2002; Moeller et al., 2007; Savor & Lu, 2009); whether both the target and the acquirer belong to the same industry (Walkling & Edmister, 1985). *Hostile* is a dummy variable that equals one when the deal is classified, by Thomson Reuters Eikon, as a hostile or unsolicited, and zero otherwise. *Competition* is a dummy variable that equals one if two or more bidders are involved in the deal, and zero

otherwise. *Tender* is a dummy variable that equals one when the deal form is classified, by Thomson Reuters Eikon, as a tender, and zero otherwise. *Cash* (*Stock*) is a dummy variable that equals one if 90% or more of the deal consideration is paid using cash (stock), and zero otherwise. *SameInd* is equal to one if both the target and the acquirer belong to the same industry (based on the two-digit Standard Industrial Classification (SIC) code), and zero otherwise. Moreover, this study includes year fixed effects and targets' industry fixed effects (based on the Fama and French (1997) 48 industry classification) to control for changes in the takeover activity over the years and across industries.

5.4.4 Empirical models

To test hypotheses, residuals of first stage regressions (i.e., unexplained takeover gains for shareholders of the target and the acquirer) are interacted with the earnings- or the accruals-based Basu measures of conservatism in second-stage regressions as follows:

a) Target returns:

$$\begin{aligned} Earn_{i,t-z}/MV_{i,t-z-1} \; or \; Acc_{i,t-z}/MV_{i,t-z-1} \\ = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\ + \beta_4 r\_TarRet_{i,t} + \beta_5 r\_TarRet_{\,i.t} * Dum_{i,t-z} + \beta_6 r\_TarRet_{\,i.t} \\ * Ret_{i,t-z} + \beta_7 r\_TarRet_{\,i.t} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z} \end{aligned} \quad (3)$$

b) Acquirer returns:

$$\begin{aligned} Earn_{i,t-z}/MV_{i,t-z-1} \; or \; Acc_{i,t-z}/MV_{i,t-z-1} \\ = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\ + \beta_4 r\_AcqRet_{i,t} + \beta_5 r\_AcqRet_{\,i.t} * Dum_{i,t-z} + \beta_6 r\_AcqRet_{\,i.t} \\ * Ret_{i,t-z} + \beta_7 r\_AcqRet_{\,i.t} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z} \end{aligned} \quad (4)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement year and ranges from 1 to 5. These models are estimated using pooled cross-section time-series OLS regressions and targets' data for earnings/ accruals and returns over a window of five fiscal years ending at the latest fiscal year-end prior to the deal announcement date. Specifically, for each target-firm with a successful acquisition

deal announced during a year t, this study includes net income before extraordinary items (or operating accruals) and market-adjusted annual stock return for five fiscal years from t-1 to t-5. It is worth noting that the value of the unexplained takeover gains (i.e., residuals obtained from first stage regressions) is constant over the five-year window for each target-firm but differs cross-sectionally. Both net income before extraordinary items (or operating accruals), deflated by lagged market value ($Earn_{i,t-z}/MV_{i,t-z-1}$, $Acc_{i,t-z}/MV_{i,t-z-1}$), and market-adjusted annual stock return ($Ret_{i,t-z}$) are winsorised at the 1% and 99% levels to minimise the effect of outliers. Standard errors of parameter estimates are double (two-way) clustered by both year and target-firm to correct for heteroskedasticity and time-series and cross-section correlations (Petersen, 2009).

According to the Basu (1997) measure, the coefficient of the interaction term between annual returns and the dummy variable of negative annual returns, β_3, reflects the asymmetric timeliness of economic gains and losses (i.e., accounting conservatism) and is expected to be positive. $r\_TarRet_{i,t}$ and $r\_AcqRet_{i,t}$ represent residuals obtained from first-stage regressions in which $TarRet_{i,t}$ and $AcqRet_{i,t}$ are regressed on several control variables that might confound the association between targets' conservatism and takeover gains. $r\_TarRet_{i,t}$ ($r\_AcqRet_{i,t}$) is interacted with $Dum_{i,t-z} * Ret_{i,t-z}$ to test the association between targets' conservative accounting and target (acquirer) returns. Thus, β_7 is the coefficient of the primary interest in the above two regressions. The expected direction of β_7 is based on the dependent variable tested. Specifically, this study expects to find a negative (positive) association between targets' conservative accounting and target (acquirer) abnormal returns around the announcement of M&A deals. No predictions are offered for other coefficients.

5.5 Sample and descriptive statistics

This study uses a large sample of M&A deals in the U.S. announced over the period from 1986 to 2017. Data about M&A deals and their characteristics is obtained from Thomson Reuters Eikon database (Deal Screener). Then, data is merged with accounting data collected from Compustat as well as market data collected from the Centre for Research in Security Prices (CRSP) for both the target and the acquirer.

Following prior studies (e.g., Moeller et al., 2003; Dionne et al., 2015; McNichols & Stubben, 2015; Martin & Shalev, 2017; Brooks et al., 2018), this study imposes the following requirements in selecting the sample:

1) Both the acquirer and the target must be a U.S. publicly listed firm,
2) Deals must be successful or completed,
3) Deals must not be labelled by Thomson Reuters Eikon as privatisations, going privates, repurchases, self-tenders, recapitalisations, spin-offs, exchange offers, minority stake purchases, or acquisitions of remaining interest,
4) The acquirer must own no shares in the target before the deal announcement date, i.e., has no toehold, to ensure that it does not have any prior access to private information and primarily depends on public information,
5) The acquirer must end up with at least 90% of ownership in the target firm by the deal completion date,
6) The deal value must be $1 million at least to ensure the materiality of the deal,[43]
7) The number of days between the deal announcement and completion dates must not exceed 1000 days, and
8) Both the target and the acquirer must have available data on both Compustat and CRSP required for measuring variables.

In addition to the above requirements, when estimating conservative reporting of target firms, this study excludes firm-year observations with negative book value of equity or share price lower than $1 (Khan & Watts, 2009). Also, as conservatism is estimated over a period of five fiscal years ending before the acquisition announcement date, available data for at least two years is required. Imposing these requirements leads to a final sample of 1,434 deals that corresponds to 6,168 firm-year observations when examining target returns, and 521 deals that corresponds to 2,249 firm-year observations when examining acquirer returns. These sample sizes vary according to the different regression analyses using alternative specifications.

Descriptive statistics and correlation coefficients between the main variables in this study are reported in Table 5.1. Descriptive statistics in Panel A of Table 5.1 show that the mean (median) percentage of abnormal returns for target shareholders around the deal announcement date is equal to 23.8% (19.1%). This indicates that target firms

[43] When examining the association between conservative reporting of target firms and target returns, this study includes all deals with value equals to or above $1 million. However, consistent with prior studies (e.g., Moeller et al., 2003; McNichols & Stubben, 2015), when examining abnormal returns for shareholders of acquiring firms, this study restricts the sample to deals in which the relative market size of the target to the acquirer is greater than 20% so that the deal would be sufficiently material to be reflected in acquirer returns.

experience large increases in their stock prices around the announcement of M&A deals. As for acquiring firms, statistics show that the average abnormal returns for acquirer shareholders equals -1.3% when considering all deals regardless of the market relative size of the target to the acquirer (i.e., 1,430 deals). However, this average decreases to -2.3% when considering only relatively material deals to acquirers in which the market relative size of the target to the acquirer is greater than 20% (i.e., 521 deals). These statistics are, in general, close to those reported in prior literature. For instance, Dhaliwal et al. (2016) report that shareholders of target firms earn, on average, 21% upon the announcement of M&A deals, while shareholders of bidding firms experience negative returns of -1%. Also, the average target (bidder) returns equals 20% (-2%) in Brooks et al. (2018).

As for firm-specific characteristics, statistics show that the median target-firm size is equal to $199 million as compared to $2,079 million for the acquirer, when size is measured as the market capitalisation of the target or the acquirer at the end of the fiscal year preceding the deal announcement date. Target firms appear to have low leverage levels on average. The mean leverage percentage for target firms is equal to 18.8%, while it equals 20.2% for acquiring firms. As for the market-to-book ratio, the market values of target firms are higher than the double of their book values on average (the mean and median *Tar_MTB* ratios equal to 2.506 and 1.751, respectively). Acquiring firms, however, have higher MTB ratios than target firms (the mean and median *Acq_MTB* ratios are 3.162 and 2.222, respectively), suggesting that acquirers, on average, perform better than targets during the pre-acquisition periods. The profitability ratio, ROE, also supports the better performance of acquiring over target firms (the mean and median ROE percentages are equal to 11.4% and 12.4% for acquirers compared to -0.3% and 8.3% for targets).

Statistics of the deal-specific characteristics are, in general, consistent with the literature (e.g., McNichols & Stubben, 2015; Chen et al., 2018a). The results show that around 17% of all deals are classified as tender offers. Deals with competition between bidders represent less than 5% of the full sample. Deals classified as hostile or unsolicited only represent about 1% of all deals. As for the method of payment, cash (stock) offers represent about 32% (36%) of all deals. Last, around 70% of all deals are intra-industry or horizontal deals (i.e., deals between firms that belong to the same two-digit SIC code).

As for the sample of firm-year observations used in second stage regressions to test hypotheses, about 53% of the full sample are observations with bad news as reflected

by negative adjusted-market stock returns. The mean (median) of earnings scaled by lagged market value equals 0.030 (0.055). The mean values of the unexplained target or acquirer returns are equal to zero as they represent the means of residuals obtained from first-stage regressions.

Panel B of Table 5.1 presents both Spearman's (above diagonal) and Pearson's (below diagonal) correlation coefficients between the main variables in this study. The results show that target size is significantly and negatively correlated with both target and acquirer returns. Therefore, takeover gains for shareholders of the target or the acquirer seem to increase in deals involving small targets. These results are consistent with Alexandridis et al. (2013) who report a negative association between target size and bidder returns, and interpret this relation as a reflection of the effect of higher complexity inherent in large target firms, and its link to the subsequent difficulties and costs of integration with these firms, on the expected synergies. The correlation coefficient between acquirer size and target returns is significantly positive. This initially indicates that target shareholders positively react to offers from larger bidders. Consistent with Eckbo (2009), both target and acquirer returns are positively correlated with the deal being classified as a tender offer. As expected, the results also show that takeover gains for shareholders of both the target and the acquirer are positively (negatively) correlated with the deal being paid in cash (stock).

Table 5.1
Descriptive statistics and correlations

Panel A: Descriptive statistics

variable	N	Mean	sd	Min	p10	p25	Median	p75	p90	Max
TarRet	1434	0.238	0.225	-0.143	0.010	0.086	0.191	0.343	0.525	1.135
AcqRet (full sample)	1430	-0.013	0.060	-0.208	-0.087	-0.043	-0.009	0.015	0.052	0.165
AcqRet (Rel_Size 20%)	521	-0.023	0.080	-0.236	-0.114	-0.071	-0.021	0.017	0.065	0.241
Tar_Size ($M)	1,434	1,031	2,610	6	25	64	199	729	2,543	19,372
Tar_MTB	1434	2.506	2.725	0.359	0.815	1.192	1.751	2.613	4.522	18.549
Tar_Lev	1434	0.188	0.181	0.000	0.000	0.032	0.142	0.298	0.450	0.746
Tar_ROE	1434	-0.003	0.352	-2.073	-0.260	0.007	0.083	0.133	0.196	0.518
Acq_Size ($M)	1,434	14,662	35,639	32	198	585	2079	9151	32472	196,576
Acq_MTB	1434	3.162	2.795	0.503	1.154	1.564	2.222	3.647	5.927	16.473
Acq_Lev	1434	0.202	0.161	0.000	0.009	0.081	0.176	0.286	0.423	0.753
Acq_ROE	1434	0.114	0.176	-0.816	-0.001	0.078	0.124	0.176	0.250	0.783
Tender	1434	0.167	0.373	0.000	0.000	0.000	0.000	0.000	1.000	1.000
Competition	1434	0.047	0.213	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Hostile	1434	0.008	0.091	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Cash	1434	0.316	0.465	0.000	0.000	0.000	0.000	1.000	1.000	1.000
Stock	1434	0.361	0.481	0.000	0.000	0.000	0.000	1.000	1.000	1.000
SameInd	1434	0.702	0.457	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Earn/lagMV	6168	0.030	0.128	-0.576	-0.104	0.008	0.055	0.088	0.134	0.330
Acc/lagMV	4644	-0.086	0.183	-1.009	-0.262	-0.117	-0.044	-0.008	0.034	0.418
Dum	6168	0.534	0.499	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Ret	6168	0.052	0.529	-0.856	-0.479	-0.260	-0.030	0.249	0.614	2.551
*Dum*Ret*	6168	-0.153	0.212	-0.856	-0.479	-0.260	-0.030	0.000	0.000	0.000
r_TarRet	6168	-0.000	0.197	-0.643	-0.218	-0.127	-0.022	0.098	0.249	0.855
r_AcqRet	2249	-0.000	0.067	-0.229	-0.083	-0.039	0.000	0.037	0.076	0.237

Table 5.1 (continued)

Panel B: Spearman's rank correlation (upper right) and Pearson's correlation coefficients (lower left)

		1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
1)	***TarRet***		**0.10**	**-0.12**	**-0.07**	**-0.06**	**-0.11**	**0.11**	**0.10**	**-0.05**	**0.06**	**0.15**	**-0.07**	0.00	**0.23**	**-0.16**	**-0.09**
2)	***AcqRet***	**0.09**		**-0.12**	**-0.07**	-0.03	-0.04	0.01	-0.02	**0.06**	0.03	**0.10**	-0.01	-0.02	**0.25**	**-0.15**	**-0.05**
3)	***Tar_Size***	**-0.15**	**-0.13**		**0.46**	**0.14**	**0.28**	**0.62**	**0.22**	**0.20**	**0.18**	-0.01	**0.07**	**0.09**	-0.03	**-0.08**	**0.05**
4)	***Tar_MTB***	-0.04	**-0.07**	**0.29**		-0.02	**0.27**	**0.41**	**0.48**	0.04	**0.21**	0.02	0.02	0.03	0.04	-0.01	**-0.08**
5)	***Tar_Lev***	**-0.04**	-0.04	**0.14**	**0.10**		**0.10**	0.00	**-0.16**	**0.40**	-0.03	**-0.04**	**0.05**	0.03	**-0.17**	**-0.05**	0.04
6)	***Tar_ROE***	**-0.13**	-0.03	**0.22**	**-0.16**	-0.04		**0.16**	0.03	**0.09**	**0.25**	**-0.08**	-0.00	0.01	**-0.17**	**0.11**	-0.00
7)	***Acq_Size***	**0.12**	-0.01	**0.63**	**0.24**	-0.00	**0.09**		**0.45**	**0.16**	**0.40**	**0.07**	-0.01	**0.06**	**0.20**	**-0.13**	**-0.09**
8)	***Acq_MTB***	**0.09**	-0.04	**0.19**	**0.31**	**-0.11**	**-0.08**	**0.36**		0.00	**0.49**	**0.06**	-0.02	-0.01	**0.09**	**0.06**	**-0.11**
9)	***Acq_Lev***	**-0.05**	**0.07**	**0.19**	-0.00	**0.43**	**0.08**	**0.09**	**0.06**		**0.08**	-0.01	0.04	-0.01	-0.01	**-0.10**	0.00
10)	***Acq_ROE***	**0.05**	**0.07**	**0.16**	0.03	-0.03	**0.21**	**0.32**	**0.21**	0.02		**0.06**	-0.03	0.02	**0.12**	-0.04	**-0.10**
11)	***Tender***	**0.15**	**0.10**	-0.02	0.04	-0.03	**-0.07**	**0.07**	**0.05**	-0.02	**0.05**		**0.15**	**0.12**	**0.41**	**-0.31**	**-0.12**
12)	***Competition***	**-0.07**	0.01	**0.08**	0.02	0.04	0.03	-0.01	0.01	0.03	-0.03	**0.15**		**0.12**	0.03	**-0.07**	0.02
13)	***Hostile***	0.01	-0.01	**0.10**	0.04	0.03	0.03	**0.06**	0.03	-0.02	0.03	**0.12**	**0.12**		-0.01	-0.02	-0.01
14)	***Cash***	**0.23**	**0.22**	**-0.05**	0.03	**-0.13**	**-0.09**	**0.21**	**0.05**	-0.01	**0.12**	**0.41**	0.03	-0.01		**-0.51**	**-0.19**
15)	***Stock***	**-0.16**	**-0.14**	**-0.07**	-0.01	**-0.09**	**0.06**	**-0.13**	0.04	**-0.12**	**-0.06**	**-0.31**	**-0.07**	-0.02	**-0.51**		**0.12**
16)	***SameInd***	**-0.10**	-0.03	**0.05**	**-0.05**	0.04	-0.01	**-0.10**	**-0.08**	0.02	**-0.08**	**-0.12**	0.02	-0.01	**-0.19**	**0.12**	

Table 5.1 reports descriptive statistics and correlation coefficients. Panel A presents the descriptive statistics for the main variables of this study. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. For ease of interpretation, Panel A reports descriptive statistics for the raw values (in millions of dollars) for both target size, *Tar_Size*, and acquirer size, *Acq_Size*. All continuous variables are winsorised at the 1% and 99% levels to mitigate the effect of extreme values. However, to avoid double winsorisation, unexplained parts of takeover gains in Panel A (i.e., *r_TarRet* and *r_AcqRet)* are not winsorised as they represent residuals obtained from first-stage regressions. Panel B reports coefficients for Spearman's (above diagonal) and Pearson's (below diagonal) correlations among main variables. Bold coefficients indicate that they are statistically significant at *p*-values less than the 10% level.

5.6 Empirical results

5.6.1 Residual takeover gains: First-stage regressions

In order to test hypotheses, this study employs a two-stage approach. In the first stage, several variables are regressed on target and acquirer returns. These variables are expected to affect target and acquirer returns and might confound the association between targets' conservatism and target and acquirer returns. They include firm-specific characteristics of both the target and the acquirer as well as deal-specific characteristics. Residuals of the first-stage regressions are saved and used as clean measures of target and acquirer returns. They represent the unexplained parts of target and acquirer returns. These residuals are then interacted with variables of Basu (1997) model in regressions of the second stage to test hypotheses.

Table 5.2 presents the results of first-stage regressions of estimating Eq. (2) when the dependent variable is either target or acquirer returns. The sample size varies based on the examined dependent variable. When examining target returns, the sample size consists of 1,434 deals. When examining acquirer returns, however, this study follows prior studies (e.g., Moeller et al., 2003; McNichols & Stubben, 2015) and restricts the sample to deals in which the relative market size of the target to the acquirer is greater than 20% so that the deal would be material to be reflected in acquirer returns. This restriction yields a sample of 521 deals. This shows that the relative market size of the target to the acquirer of about 63% of the full sample is equal to or less than 20%. This indicates that a high percentage of all deals in the M&A market represents acquisition transactions of small target firms.

As for target characteristics, the results show that the relation between target size and target returns is significantly negative, suggesting that abnormal returns around the deal announcement date for target shareholders decrease when target size increases. This result is consistent with prior studies reporting a negative relation between target size and target returns (e.g., Martin & Shalev, 2017). This is also in line with the negative association between target size and takeover premium offered by the acquirer to target shareholders (e.g., Eckbo, 2009; Alexandridis et al., 2013). The results also show that target leverage is positively (negatively) associated with the target (acquirer) returns.

Table 5.2
Controlling for confounding effects: First-stage regressions

$$Dependent\_Var_{i,t} = \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} + \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Acq\_Size_{i,t-1} + \alpha_6 Acq\_MTB_{i,t-1} + \alpha_7 Acq\_Lev_{i,t-1} + \alpha_8 Acq\_ROE_{i,t-1} + \alpha_9 Tender_{i,t} + \alpha_{10} Competition_{i,t} + \alpha_{11} Hostile_{i,t} + \alpha_{12} Cash_{i,t} + \alpha_{13} Stock_{i,t} + \alpha_{14} SameInd_{i,t} + \mu_n Year\ dummies + \lambda_n Industry\ dummies + \varepsilon_{i,t}$$

Variables	*Dep. Var. = TarRet*	*Dep. Var. = AcqRet*
Intercept	0.066	-0.091
	(0.992)	(-1.243)
Tar_Size	-0.041***	0.003
	(-7.613)	(0.482)
Tar_MTB	-0.004	0.001
	(-1.458)	(0.433)
Tar_Lev	0.070*	-0.043*
	(1.689)	(-1.847)
Tar_ROE	-0.035	-0.029*
	(-1.548)	(-1.679)
Acq_Size	0.030***	-0.013*
	(6.283)	(-1.961)
Acq_MTB	0.004	-0.003
	(1.496)	(-1.409)
Acq_Lev	-0.033	0.056**
	(-0.763)	(2.439)
Acq_ROE	-0.000	0.061***
	(-0.008)	(2.951)
Tender	0.028	0.012
	(1.412)	(0.841)
Competition	-0.059***	-0.005
	(-2.915)	(-0.288)
Hostile	0.086	0.013
	(1.182)	(0.615)
Cash	0.034*	0.038***
	(1.957)	(3.115)
Stock	-0.021	0.001
	(-1.515)	(0.143)
SameInd	-0.009	0.003
	(-0.627)	(0.384)
Year FE	Included	Included
Industry FE	Included	Included
N	1,434	521
R-squared	0.225	0.309

This table presents the results of first-stage regressions used to orthogonalise measures of takeover gains for target and acquirer shareholders from the effect of confounding variables. *TarRet* (*AcqRet*) is the target (acquirer) announcement returns and is estimated as cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns for both the target and the acquirer are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. When examining target returns, the full sample of 1,434 deals is used. When examining acquirer returns, the sample is restricted to deals in which the relative market size of the target to the acquirer is greater than 20% so that the deal would be sufficiently material to be reflected in acquirer returns. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. All continuous variables are winsorised at the 1% and 99% levels to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects and Fama-French 48 industry fixed effects are included in all regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

Regarding acquirer characteristics, the results demonstrate that acquirer size is positively (negatively) associated with target (acquirer) returns. This is consistent with the evidence that larger acquirers offer larger premiums to target shareholders, which would lead to the positive (negative) reaction of target (acquirer) shareholders (e.g., Moeller et al., 2004; McNichols & Stubben, 2015). Acquirer shareholders are also found to positively react to deal announcements when acquirers have higher leverage rates. This might lend support for the monitoring role of leverage in reducing agency conflicts and, therefore, improving managers' investment decisions. Further, the results show a significantly positive association between the acquirer's profitability and acquirer returns.

With respect to deal characteristics, target returns are found to positively associate with the use of cash in deal payment. This is consistent with prior evidence that abnormal returns for target shareholders are significantly higher when cash is used for paying the deal consideration (Wansley et al., 1983; Huang & Walkling, 1987). As for bidder returns, although the results show a positive association between using cash and acquirer returns, consistent with prior literature (e.g., Travlos, 1987; Chemmanur et al., 2009), the results do not support the negative impact of using stock on acquirer returns.

5.6.2 Testing hypotheses: Second-stage regressions

Residuals of takeover gains obtained from first-stage regressions are interacted with all variables of Basu (1997) measure of conservatism in second-stage regressions to test hypotheses.

5.6.2.1 Target's conservative accounting and target returns

Table 5.3 reports the results of testing the first hypothesis stating that target returns decrease with the increase in conservative accounting of target firms. Columns (1) and (2) present the results when using the earnings-based Basu (1997) measure. The results using the accruals-based Basu measure are reported in columns (3) and (4) when all deals are included in analyses and in columns (5) and (6) when deals of targets belonging to financial and utility industries are excluded.

Columns (1), (3) and (5) present the results of estimating targets' conservative accounting without any interactions with residuals of target or acquirer returns. As expected, the coefficient β_3 of the interaction term between annual market-adjusted returns and the dummy variable of negative returns (i.e., *Dum*Ret*) is significantly

positive, consistent with Basu (1997) in all models. For instance, when using the earnings-based Basu in column (1), β_3 equals 0.203 and *t* equals 15.211 (*t*-statistics are based on robust standard errors that are double (two-way) clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009)). This indicates that target firms, on average, conservatively report over the five-year period preceding announcements of M&A deals. β_3 holds to be significantly positive when interacting measures of conservatism with residuals of target returns in columns (2), (4) and (6).

Columns (2) reports the results of testing the first hypothesis when earnings are used as the dependent variable in the Basu model. In this case, the sample consists of 6,168 firm-year observations, corresponding to 1,434 deals. The primary coefficient of interest is β_7 of the interaction term between residuals of target returns and the measure of conservatism (i.e., *r_TarRet*Dum*Ret)*. The results show that β_7 equals -0.156 and is significantly negative at the 5% level (*t* = -2.365). This is consistent with the prediction of the first hypothesis that the target's conservative accounting is negatively associated with abnormal returns for target shareholders around the deal announcement date, suggesting that target announcement returns decrease when target firms follow more conservative reporting practices over the years preceding announcements of M&A deals.

Table 5.3 also presents the results of testing the first hypothesis when using the accruals-based Basu model. The results are reported in columns (4) and (6) when including and excluding deals of target firms belonging to financial and utility industries, respectively. Consistent with the results of using the earnings-based Basu model, the results show that β_7 is negative and statistically significant at the 5% level. For instance, β_7 = -0.210 and *t* = -2.304 when considering all target firms including those belonging to financial and utility industries in column (4). Consequently, the results support the prediction of the first hypothesis that the target's conservative accounting negatively associate with target returns.

Thus, the results of testing the first hypothesis suggest that conservative accounting of target firms help bidders to bid more effectively and avoid overpayment to target shareholders. Acquirers' more effective bidding would lead, in turn, to the less favourable reaction by target shareholders to the deal announcement as they prefer to receive larger premiums.

Table 5.3

Target's conservative accounting and target returns (H_1)

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \beta_4 r\_TarRet_{i,t} + \beta_5 r\_TarRet_{i.t} * Dum_{i,t-z} + \beta_6 r\_TarRet_{i.t} * Ret_{i,t-z} + \beta_7 r\_TarRet_{i.t} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}$$

Coeff.	Variables	*Y= Earnings*		*Y= Accruals*		*Y= Accruals*	
		(1)	(2)	(3)	(4)	(5)	(6)
β_0	*Intercept*	0.061***	0.060***	-0.070***	-0.071***	-0.064***	-0.065***
		(19.328)	(19.596)	(-13.391)	(-13.673)	(-12.416)	(-12.647)
β_1	*Dum*	0.000	0.001	0.006	0.007	-0.001	0.000
		(0.086)	(0.209)	(0.820)	(0.908)	(-0.120)	(0.019)
β_2	*Ret*	0.003	0.005	-0.031***	-0.028***	-0.028***	-0.025***
		(0.340)	(0.730)	(-2.900)	(-2.641)	(-3.006)	(-2.651)
β_3	*Dum*Ret*	0.203***	0.199***	0.110***	0.105***	0.057***	0.053***
		(15.211)	(15.183)	(5.222)	(5.033)	(3.353)	(3.103)
β_4	*r_TarRet*		-0.017		-0.027		-0.004
			(-0.812)		(-0.954)		(-0.145)
β_5	*r_TarRet*Dum*		0.012		-0.005		-0.039
			(0.435)		(-0.131)		(-0.999)
β_6	*r_TarRet*Ret*		0.089**		0.083*		0.064
			(2.057)		(1.678)		(1.466)
β_7	***r_TarRet*Dum*Ret***		**-0.156****		**-0.210****		**-0.181****
			(-2.365)		**(-2.304)**		**(-2.297)**
N		6,168	6,168	4,644	4,644	3,530	3,530
R-squared		0.116	0.119	0.009	0.012	0.009	0.012

This table reports the results of the first hypothesis testing the association between targets' conservative accounting and abnormal returns for target shareholders around the announcement of M&A deals. Columns (1) and (2) present the results when using the earnings-based Basu (1997) measure. The results using the accruals-based Basu measure are reported in columns (3) and (4) when all deals are included in analyses and in columns (5) and (6) when deals of targets belonging to financial and utility industries are excluded. *r_TarRet* refers to residuals of target returns. *r_TarRet* is obtained from the first-stage regression of control variables on target returns. Target returns are estimated as the cumulative abnormal returns of the target over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. t-statistics are reported in parentheses under coefficients estimates. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% levels to minimise the effect of outliers. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.6.2.2 Target's conservative accounting and acquirer returns

The second hypothesis states that acquirer returns are positively associated with the target's conservative accounting. Similar to models of testing target returns, variables of both the earnings- and accruals-based Basu (1997) measures are interacted with residuals of acquirer returns in second-stage regressions to test the second hypothesis. Residuals of acquirer returns are obtained from the first-stage regression. Table 5.4 presents the results of testing the association between the target's accounting conservatism and acquirer returns. As mentioned before, the number of deals used in testing acquirer returns decreases as a result of excluding small deals in which the relative market size of the target to the acquirer is equal to or less than 20%. This cut-off ensures the materiality of the deal to acquirer shareholders and, therefore, possibly affecting acquirer returns.[44]

The results of using earnings as the dependent variable in Basu model are reported in columns (1) and (2) and of using accruals instead are presented in columns (3) to (6). The results show that the coefficient β_7 of the association between the target's conservative accounting and acquirer returns is positive but insignificant when using the earnings-based Basu measure. However, when using the accruals-based Basu measure, the results demonstrate that β_7 is positive and statistically significant at the 5% level regardless of whether the sample includes deals involving targets belonging to financial and utility industries or not. For instance, column (4) shows that β_7 equals 0.905 and t = 2.108. These results are consistent with the prediction of the second hypothesis. Thus, these results provide some evidence that returns for acquirer shareholders are higher in acquisitions of target firms that are more conservative in their financial reporting over the five fiscal years preceding the acquisition announcement.

Overall, the results suggest that acquirer shareholders are more likely to positively perceive M&A deals involving target firms with more conservative financial reports. This might be due to the potential role of conservative accounting in mitigating the negative consequences of the target's information asymmetry on merger outcomes.

[44] As a robustness check, this study uses alternative cut-offs of 15% and 25% of the relative market size of the target to the acquirer. The results are reported in Table A.5.2 in the appendix of this chapter and are qualitatively similar to those when using the cut-off of 20%.

Table 5.4
Target's conservative accounting and acquirer returns (H_2)

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \beta_4 r\_AcqRet_{i,t} + \beta_5 r\_AcqRet_{i.t} * Dum_{i,t-z} + \beta_6 r\_AcqRet_{i.t} * Ret_{i,t-z} + \beta_7 r\_AcqRet_{i.t} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}$$

Coeff.	Variables	*Y= Earnings*		*Y= Accruals*		*Y= Accruals*	
		(1)	(2)	(3)	(4)	(5)	(6)
β_0	*Intercept*	0.063***	0.062***	-0.075***	-0.070***	-0.077***	-0.073***
		(12.842)	(12.452)	(-7.774)	(-7.140)	(-8.525)	(-8.044)
β_1	*Dum*	0.002	0.002	0.015	0.011	0.012	0.008
		(0.222)	(0.338)	(1.065)	(0.753)	(0.914)	(0.616)
β_2	*Ret*	-0.000	0.001	-0.056**	-0.070***	-0.037*	-0.048**
		(-0.033)	(0.093)	(-2.316)	(-2.822)	(-1.929)	(-2.496)
β_3	*Dum*Ret*	0.189***	0.188***	0.146***	0.161***	0.047	0.059*
		(8.122)	(7.992)	(3.123)	(3.420)	(1.450)	(1.810)
β_4	*r_AcqRet*		-0.052		0.217*		0.120
			(-0.762)		(1.693)		(1.010)
β_5	*r_AcqRet*Dum*		0.139		-0.074		-0.017
			(1.502)		(-0.428)		(-0.103)
β_6	*r_AcqRet*Ret*		0.131		-0.728***		-0.467***
			(1.103)		(-2.907)		(-2.737)
$\boldsymbol{\beta_7}$	***r_AcqRet*Dum*Ret***		**0.078**		**0.905****		**0.677****
			(0.325)		**(2.108)**		**(2.163)**
N		2,249	2,249	1,771	1,771	1,239	1,239
R-squared		0.091	0.093	0.016	0.028	0.019	0.035

This table reports the results of the second hypothesis testing the association between the target's conservative accounting and abnormal returns for acquirer shareholders around the announcement of the M&A deal. Columns (1) and (2) present the results when using the earnings-based Basu (1997) measure. The results using the accruals-based Basu measure are reported in columns (3) and (4) when all deals are included in analyses and in columns (5) and (6) when deals of targets belonging to financial and utility industries are excluded. *r_AcqRet* refers to residuals of acquirer returns. *r_AcqRet* is obtained from the first-stage regression of control variables on acquirer returns that are estimated as the cumulative abnormal returns of the acquirer over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. *t*-statistics are reported in parentheses under coefficients estimates. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% levels to minimise the effect of outliers. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.7 Sensitivity analyses

This study uses several sensitivity analyses to ensure the robustness of the results as follows:

5.7.1 Alternative measures of accounting conservatism

This study uses two alternative measures of accounting conservatism. The first is the Ball and Shivakumar (2005) measure. This measure employs the same idea of the asymmetric

timeliness of good and bad news and a similar model structure as in Basu (1997) measure. However, it uses a nonmarket-based proxy for economic gains and losses as a regressor (namely, cash flows from operations) rather than stock returns and, therefore, it is less vulnerable to the concerns of the market mispricing or the market-wide shocks. In addition, it uses accruals rather than earnings as a regressand. To capture the target's pre-merger commitment of using conservative accounting, the following Ball and Shivakumar (2005) piece-wise model is estimated over a pooled cross-section time-series window of five years ending at the target's latest fiscal year-end prior to the deal announcement date:

$$Acc_{i,t-z} = \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \varepsilon_{i,t-z} \quad (5)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. Following Hribar and Collins (2002), $Acc_{i,t-z}$ represents operating accruals calculated as earnings before extraordinary and exceptional items (Compustat item: ib) minus cash flows from continuing operations. Cash flows from continuing operations is calculated as cash flows from operations minus extraordinary items and discontinued operations as directly retrieved from the statement of cash flows (Compustat items: [oancf – xidoc]). $CF_{i,t-z}$ represents either normal cash flows from continuing operations or the industry and year median-adjusted cash flows from continuing operations.[45] Both operating accruals and cash flows from continuing operations are standardised by total assets (Compustat item: at) at the beginning of the fiscal year. $D_{i,t-z}$ is a dummy variable that equals one when $CF_{i,t-z}$ is negative, and zero otherwise.

To test hypotheses, residuals of target or acquirer returns, obtained from first-stage regressions (using Eq. (2)), are interacted with all explanatory variables of Ball and Shivakumar (2005) model as follows:

[45] The industry and year median-adjusted cash flows from continuing operations is calculated as the difference between each target firm cash flows from continuing operations standardised by lagged total assets in a specific calendar year and the median of cash flows from continuing operations standardised by lagged total assets for all targets in the same industry (Fama-French 12 industry classification is used) and calendar year. A minimum of 10 target firms in the same industry and calendar year is required to calculate the median of cash flows and to include firm-year observations in analyses.

$$Acc_{i,t-z} = \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \beta_4 r\_TarRet_{i,t} + \beta_5 r\_TarRet_{i.t} * D_{i,t-z} + \beta_6 r\_TarRet_{i.t} * CF_{i,t-z} + \boldsymbol{\beta_7 r\_TarRet_{i.t} * D_{i,t-z} * CF_{i,t-z}} + \varepsilon_{i,t-z} \quad (6)$$

$$Acc_{i,t-z} = \beta_0 + \beta_1 D_{i,t-z} + \beta_2 CF_{i,t-z} + \beta_3 D_{i,t-z} * CF_{i,t-z} + \beta_4 r\_AcqRet_{i,t} + \beta_5 r\_AcqRet_{i.t} * D_{i,t-z} + \beta_6 r\_AcqRet_{i.t} * CF_{i,t-z} + \boldsymbol{\beta_7 r\_AcqRet_{i.t} * D_{i,t-z} * CF_{i,t-z}} + \varepsilon_{i,t-z} \quad (7)$$

where t is the deal announcement year and z is the fiscal year prior to the deal announcement date and ranges from 1 to 5. β_2 is expected to be negative (Dechow et al., 1998). β_3 reflects the asymmetric timeliness of economic gains and losses (i.e., conservative accounting) and is expected to be positive. $r\_TarRet_{i,t}$ ($r\_AcqRet_{i,t}$) is the unexplained part of target (acquirer) returns, i.e., residuals obtained from first-stage regressions. $r\_TarRet_{i,t}$ ($r\_AcqRet_{i,t}$) is interacted with $D_{i,t-z} * CF_{i,t-z}$ to test the association between the target's conservative accounting and target (acquirer) returns. Thus, β_7 is the coefficient of the primary interest in the two equations. For target returns in Eq. (6), β_7 is expected to be negative. However, for acquirer returns in Eq. (7), β_7 is expected to be positive. Accruals and cash flows from continuing operations ($Acc_{i,t-z}$ and $CF_{i,t-z}$), after being standardised by total assets at the beginning of the fiscal year, are winsorised at the 1% and 99% levels to minimise the effect of outliers. Standard errors of the parameter estimates are double (two-way) clustered by year and target-firm to correct for heteroskedasticity and time-series and cross-section correlations (Petersen, 2009).

Table 5.5 presents the results of estimating Eqs. (6) and (7) testing hypotheses. As for target returns, and when using normal cash flows from operations in calculating CF in column (2), the results show that the coefficient β_7 is negative but insignificant (t = -1.444). However, when using industry median-adjusted cash flows from operations in calculating CF, β_7 is significantly negative at the 5% level. Thus, the results give some support for the hypothesis that target returns are lower when target firms report conservatively over the years preceding the acquisition. With respect to acquirer returns, the results show that the coefficient β_7 is significantly positive, whether when using normal cash flows (in column (4)) or industry median-adjusted cash flows (in column (5))

in calculating CF. Therefore, the results are consistent with the prediction of the second hypothesis that acquirer returns are higher (or less negative) when target firms are more conservative in their financial statements.

The second alternative measure of conservatism is the *C_Score* of Khan and Watts (2009). This is a firm-year measure that is based on Basu measure. Khan and Watts (2009) begin with Basu measure as illustrated before:

$$Earn_i/MV_{i,t-1} = \beta_0 + \beta_1 Dum_i + \beta_2 Ret_i + \beta_3 Dum_i * Ret_i + \varepsilon_i \quad (8)$$

Then, Khan & Watts modify the original Basu model by specifying that β_2 (timeliness of good news; or *G_Score*) and β_3 (the incremental timeliness of bad news, or *C_Score*) as linear functions of the characteristics of each firm (firm size, market-to-book ratio, and firm leverage) in each year. They define that:

$$G\_Score = \beta_2 = \mu_1 + \mu_2 SIZE_i + \mu_3 MTB_i + \mu_4 LEV_i \quad (9)$$

$$C\_Score = \beta_3 = \alpha_1 + \alpha_2 SIZE_i + \alpha_3 MTB_i + \alpha_4 LEV_i \quad (10)$$

where firm size, *SIZE*, is defined as the natural logarithm of the target's market capitalisation. Market-to-book ratio, *MTB*, is calculated as the ratio of the target's market value of equity to its book value of equity. Leverage, *LEV*, is the ratio of the target's long-term debt and short-term debt to its total assets. By substituting equations (9) and (10) into (8), the following *Basu modified* model is obtained:

$$\begin{aligned} Earn_i/MV_{i,t-1} &= \beta_0 + \beta_1 Dum_i \\ &+ Ret_i(\mu_1 + \mu_2 SIZE_i + \mu_3 MTB_i + \mu_4 LEV_i) + Dum_i \\ &* Ret_i(\alpha_1 + \alpha_2 SIZE_i + \alpha_3 MTB_i + \alpha_4 LEV_i) + (\delta_1 SIZE_i \\ &+ \delta_2 MTB_i + \delta_3 LEV_i + \delta_4 Dum_i * SIZE_i + \delta_5 Dum_i * MTB_i \\ &+ \delta_6 Dum_i * LEV_i) + \varepsilon_i \end{aligned} \quad (11)$$

This model is estimated *annually and cross-sectionally* to obtain estimates for μ and α. Then, *C_Score* is estimated each year over the five years prior to an acquisition by using the yearly estimates of μ and α using Eq. (10). Thus, *C_Score* represents a firm-

year measure of the incremental timeliness of bad news over good news (i.e., conservatism), and higher values of *C_Score* reflect higher levels of conservatism.

To test hypotheses, the average *C_Score* over the five fiscal years leading to an acquisition, *C_Score_Avg*, is incorporated into the cross-section regression model (2) with other control variables. The following cross-section regression model is estimated:

$$\begin{aligned} Dep.Var._{i,t} = {} & \alpha_0 + \boldsymbol{\alpha_1 C\_Score\_Avg_i} + \alpha_2 Tar\_Size_{i,t-1} \\ & + \alpha_3 Tar\_MTB_{i,t-1} + \alpha_4 Tar\_Lev_{i,t-1} + \alpha_5 Tar\_ROE_{i,t-1} \\ & + \alpha_6 Acq\_Size_{i,t-1} + \alpha_7 Acq\_MTB_{i,t-1} + \alpha_8 Acq\_Lev_{i,t-1} \\ & + \alpha_9 Acq\_ROE_{i,t-1} + \alpha_{10} Tender_{i,t} + \alpha_{11} Competition_{i,t} \\ & + \alpha_{12} Hostile_{i,t} + \alpha_{13} Cash_{i,t} + \alpha_{14} Stock_{i,t} + \alpha_{15} SameInd_{i,t} \\ & + \mu_n \, Year\ dummies + \lambda_n \, Industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (12)$$

where $Dep.Var._{i,t}$ refers to either target returns, $TarRet_{i,t}$, or acquirer returns $AcqRet_{i,t}$.

The results of using *C_Score* measure are reported in Table 5.6. As for target returns, the coefficient of *C_Score_Avg* is negative (β = -0.410) and statistically significant at the 5 % level (t = -2.067) when year and industry fixed effects are not controlled for (column (1)). The coefficient becomes insignificantly negative, however, when including year and industry fixed effects as control variables (column (2)). As for acquirer returns in columns (3) and (4), the results show that the coefficient of *C_Score_Avg* is positive and statistically significant at the 1% level whether when including or excluding year and industry fixed effects. For instance, the coefficient equals 0.299 and t equals 2.811 when including year and industry fixed effects in column (4). Thus, the results of using *C_Score* are consistent with the results of the main analyses.

Table 5.5
The use of Ball and Shivakumar (2005) conservatism measure

Variables	*Dep. Var.* = $\boldsymbol{Acc_{i,t-z}}$				
	CF = cash flows			*CF* = adjusted cash flows	
	1	2	3	4	5
Intercept	-0.013***	-0.013***	-0.012***	-0.040***	-0.033***
	(-6.346)	(-6.344)	(-3.922)	(-17.033)	(-7.734)
D	0.001	-0.000	0.006	0.012***	0.018***
	(0.167)	(-0.022)	(0.502)	(3.414)	(2.985)
CF	-0.445***	-0.445***	-0.425***	-0.436***	-0.465***
	(-22.384)	(-22.403)	(-12.186)	(-12.934)	(-5.501)
*D*CF*	0.529***	0.518***	0.540***	0.476***	0.541***
	(11.946)	(11.886)	(5.533)	(10.822)	(4.959)
r_TarRet		-0.001		-0.023	
		(-0.102)		(-1.622)	
*r_TarRet*D*		-0.026		0.018	
		(-0.797)		(0.915)	
*r_TarRet*CF*		0.033		0.305*	
		(0.311)		(1.700)	
r_TarRet*D*CF		**-0.254**		**-0.448****	
		(-1.444)		**(-2.204)**	
r_AcqRet			0.052		0.078
			(1.055)		(1.155)
*r_AcqRet*D*			0.182		-0.026
			(1.153)		(-0.279)
*r_AcqRet*CF*			-0.624		-1.665*
			(-1.384)		(-1.888)
r_AcqRet*D*CF			**2.697****		**3.040*****
			(2.572)		**(2.863)**
N	4,644	4,644	1,767	3,991	939
R-squared	0.133	0.135	0.168	0.093	0.127

This table reports the results of testing hypotheses using Ball and Shivakumar (2005) conservatism measure. Column (1) presents the results for estimating Eq. (5) of Ball and Shivakumar (2005) measure. Columns (2) and (4) report the results of estimating Eq. (6) testing the association between the target's conservatism and target returns. Columns (3) and (5) report the results of estimating Eq. (7) testing the association between the target's conservatism and acquirer returns. *r_TarRet* (*r_AcqRet*) is residuals of target (acquirer) returns. $Acc_{i,t-z}$ is operating accruals calculated as earnings before extraordinary and exceptional items minus cash flows from continuing operations. Cash flows from continuing operations is calculated as cash flows from operations minus extraordinary items and discontinued operations as directly retrieved from the statement of cash flows. Both operating accruals and cash flows from continuing operations are standardised by total assets at the beginning of the fiscal year. $D_{i,t-z}$ is a dummy variable for bad news that equals one when $CF_{i,t-z}$ is negative, and zero otherwise. Both $Acc_{i,t-z}$ and $CF_{i,t-z}$, after being standardised by total assets at the beginning of the fiscal year, are winsorised at the 1% and 99% levels to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

Table 5.6
The use of Khan and Watts (2009) *C_Score* measure

Variables	*Dep. Var. = TarRet*		*Dep. Var. = AcqRet*	
	1	2	3	4
Intercept	0.347***	0.159*	-0.091**	-0.194**
	(4.594)	(1.714)	(-2.465)	(-2.309)
C_Score_Avg	**-0.410****	**-0.310**	**0.286*****	**0.299*****
	(-2.067)	**(-1.545)**	**(3.196)**	**(2.811)**
Tar_Size	-0.052***	-0.052***	0.012*	0.013*
	(-5.425)	(-5.181)	(1.763)	(1.688)
Tar_MTB	-0.007**	-0.006**	0.004*	0.004*
	(-2.559)	(-2.072)	(1.781)	(1.766)
Tar_Lev	0.050	0.078*	-0.048**	-0.030
	(1.224)	(1.877)	(-2.262)	(-1.300)
Tar_ROE	-0.037	-0.031	-0.029	-0.030
	(-1.553)	(-1.332)	(-1.630)	(-1.639)
Acq_Size	0.030***	0.030***	-0.010	-0.012*
	(6.446)	(6.295)	(-1.606)	(-1.919)
Acq_MTB	0.005*	0.005	-0.003**	-0.002
	(1.779)	(1.609)	(-2.166)	(-1.370)
Acq_Lev	-0.034	-0.027	0.079***	0.054**
	(-0.796)	(-0.607)	(3.655)	(2.355)
Acq_ROE	-0.011	0.001	0.074***	0.064***
	(-0.273)	(0.021)	(4.049)	(3.181)
Tender	0.033*	0.029	0.000	0.010
	(1.735)	(1.410)	(0.040)	(0.717)
Competition	-0.065***	-0.058***	0.002	-0.003
	(-3.250)	(-2.868)	(0.163)	(-0.180)
Hostile	0.054	0.089	0.020	0.003
	(0.824)	(1.221)	(1.155)	(0.119)
Cash	0.046***	0.036**	0.046***	0.037***
	(2.796)	(2.070)	(4.200)	(3.174)
Stock	-0.037***	-0.020	-0.003	0.000
	(-2.888)	(-1.469)	(-0.434)	(0.051)
SameInd	-0.012	-0.010	0.010	0.002
	(-0.922)	(-0.695)	(1.154)	(0.241)
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
N	1,425	1,425	518	518
R-squared	0.143	0.228	0.164	0.323

This table presents the results of using Khan and Watts (2009) *C_Score* measure of accounting conservatism. The dependent variable is either *TarRet* or *AcqRet* that refers to target or acquirer returns. *TarRet* (*AcqRet*) is estimated as the cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns for both the target and the acquirer are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. All continuous variables are winsorised at the 1% and 99% levels to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Indicator variables for year fixed effects and Fama-French 48 industry fixed effects are included in some regressions whose results are suppressed to save space. Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.7.2 Using the market-adjusted model to estimate target and acquirer returns

In the main analysis, this study uses the market model to estimate cumulative abnormal returns around the deal announcement date for both target and acquirer shareholders. As robustness, and following prior studies (e.g., Moeller et al., 2004; McNichols & Stubben, 2015), this study estimates target and acquirer returns using the market-adjusted model. According to this method, the market return during the event window is used as the normal or expected return that is directly subtracted from the firm's actual return over the event period to calculate the abnormal return as follows:

$$Abnormal\_R_{i,t} = R_{i,t} - R_{m,t}, \text{ over the event window.}$$

Then abnormal returns are cumulated over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). The CRSP value-weighted returns are used as the market index. Therefore, for each target or acquirer, announcement returns equal:

$$TarRet_i \text{ or } AcqRet_i = \sum_{t=-1}^{1}(R_{i,t} - R_{m,t}),$$

where $R_{i,t}$ is the daily stock return for the target or the acquirer, $R_{m,t}$ is the daily CRSP value-weighted market returns, and *t* refers to the day and ranges from one day before (-1) to one day after (+1) the day of the deal announcement (0).

Therefore, this study re-estimates Eq. (2), i.e., first-stage regressions, using $TarRet_i$ or $AcqRet_i$ estimated by the market-adjusted model. Then residuals are obtained and interacted with Basu (1997) measure as in Eqs. (3) and (4). The results of second-stage regressions using the market-adjusted model are reported in Table 5.7. The results are very similar to those of the main analyses and support the predictions of the two hypotheses that target (acquirer) returns are negatively (positively) associated with the target's conservatism.

Table 5.7
Using the market-adjusted model to estimate abnormal returns around deal announcement date

Variables	*Y= Earnings*		*Y= Accruals*		*Y= Accruals*	
	1	2	3	4	5	6
Intercept	0.060***	0.062***	-0.071***	-0.071***	-0.065***	-0.073***
	(19.615)	(12.499)	(-13.688)	(-7.168)	(-12.673)	(-8.099)
Dum	0.001	0.003	0.007	0.011	0.000	0.008
	(0.205)	(0.358)	(0.909)	(0.769)	(0.023)	(0.656)
Ret	0.005	0.001	-0.028***	-0.069***	-0.025***	-0.047**
	(0.723)	(0.110)	(-2.652)	(-2.778)	(-2.662)	(-2.437)
*Dum*Ret*	0.199***	0.187***	0.105***	0.160***	0.053***	0.058*
	(15.192)	(8.004)	(5.036)	(3.396)	(3.107)	(1.778)
r_TarRet	-0.017		-0.029		-0.007	
	(-0.854)		(-1.049)		(-0.285)	
*r_TarRet*Dum*	0.091**		0.085*		0.067	
	(2.116)		(1.717)		(1.535)	
*r_TarRet*Ret*	0.013		-0.005		-0.035	
	(0.472)		(-0.117)		(-0.926)	
r_TarRet*Dum*Ret	**-0.158****		**-0.215****		**-0.183****	
	(-2.406)		**(-2.363)**		**(-2.340)**	
r_AcqRet		-0.082		0.201		0.110
		(-1.218)		(1.525)		(0.903)
*r_AcqRet*Dum*		0.170		-0.751***		-0.478**
		(1.365)		(-2.730)		(-2.459)
*r_AcqRet*Ret*		0.169*		-0.071		0.008
		(1.779)		(-0.395)		(0.046)
r_AcqRet*Dum*Ret		**0.012**		**0.846***		**0.705****
		(0.047)		**(1.861)**		**(2.099)**
N	6,168	2,249	4,644	1,771	3,530	1,239
R-squared	0.119	0.093	0.012	0.028	0.012	0.033

This table reports the results of testing hypotheses (second stage regressions) when using the market-adjusted model to estimate target and acquirer returns. Columns (1) and (2) present the results when using the earnings-based Basu (1997) measure. The results when using the accruals-based Basu measure are reported in columns (3) and (4) when all deals are included in analyses and in columns (5) and (6) when deals of targets belonging to financial and utility industries are excluded. *t*-statistics are reported in parentheses under coefficients estimates. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% levels to minimise the effect of outliers. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.7.3 Testing hypotheses using a one-stage approach

In the main analyses, this study uses a two-stage approach to test hypotheses. However, some studies show that using residuals obtained from a first-stage regression as the dependent variable in a second-stage regression might yield biased estimates of coefficients and *t*-statistics (Chen et al., 2018b; Christodoulou et al., 2018). Therefore, to avoid the probable incorrect inferences driven by using the two-stage approach, this study alternatively uses the standard one-stage approach to test hypotheses. In particular, this study interacts variables of Basu (1997) measure of conservatism directly with target or acquirer returns, instead of residual or unpredicted target or acquirer returns. Therefore,

this study re-estimates Eqs. (3) and (4) after interacting *TarRet* and *AcqRet*, instead of *r_TarRet* and *r_AcqRet*, with variables of Basu measure. The results of using the one-stage approach are shown in Table 5.8. The results support the predictions of the hypotheses that target (acquirer) returns are negatively (positively) associated with the target's conservative reporting. Thus, the results and inferences specified in the main analyses are unlikely to be a matter of the methodology employed.

Table 5.8
Testing hypotheses using a one-stage approach

Variables	*Y= Earnings*		*Y= Accruals*		*Y= Accruals*	
	1	2	3	4	5	6
Intercept	0.075***	0.061***	-0.069***	-0.066***	-0.069***	-0.069***
	(15.714)	(11.736)	(-8.991)	(-6.465)	(-9.053)	(-7.784)
Dum	-0.001	0.005	0.016	0.008	0.021*	0.004
	(-0.204)	(0.702)	(1.379)	(0.563)	(1.858)	(0.289)
Ret	-0.017	0.007	-0.046***	-0.089***	-0.035***	-0.062***
	(-1.516)	(0.516)	(-3.150)	(-3.414)	(-2.703)	(-3.253)
*Dum*Ret*	0.241***	0.188***	0.153***	0.194***	0.098***	0.077**
	(12.316)	(7.536)	(5.102)	(3.864)	(4.117)	(2.267)
TarRet	-0.067***		-0.005		0.017	
	(-3.941)		(-0.200)		(0.779)	
*TarRet*Dum*	0.015		-0.036		-0.078**	
	(0.639)		(-1.012)		(-2.259)	
*TarRet*Ret*	0.095**		0.070		0.035	
	(2.473)		(1.494)		(0.826)	
TarRet*Dum*Ret	**-0.174*** **		**-0.181** **		**-0.158** **	
	(-2.908)		**(-2.177)**		**(-2.180)**	
AcqRet		-0.046		0.183*		0.137
		(-0.819)		(1.861)		(1.621)
*AcqRet*Dum*		0.100		-0.105		-0.151
		(1.268)		(-0.752)		(-1.162)
*AcqRet*Ret*		0.200*		-0.740***		-0.501***
		(1.928)		(-3.741)		(-4.186)
AcqRet*Dum*Ret		**0.047**		**1.195*** **		**0.638** **
		(0.245)		**(3.381)**		**(2.434)**
N	6,168	2,249	4,644	1,771	3,530	1,239
R-squared	0.121	0.096	0.012	0.040	0.012	0.051

This table reports the results of testing hypotheses using the standard one-stage approach. Columns (1), (3) and (5) present the results of testing the first hypothesis and columns (2), (4) and (6) report the results of testing the second hypothesis. Columns (1) and (2) present the results when using the earnings-based Basu (1997) measure. The results when using the accruals-based Basu measure are reported in columns (3) and (4) when all deals are included in analyses and in columns (5) and (6) when deals of targets belonging to financial and utility industries are excluded. *TarRet* (*AcqRet*) is the target (acquirer) announcement returns and is estimated as the cumulative abnormal returns of the target (acquirer) over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns for the target or the acquirer are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered. Earnings, accruals, and adjusted-market returns are winsorised at the 1% and 99% levels to minimise the effect of outliers. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.7.4 Endogeneity: Controlling for potentially omitted correlated variables

The literature shows that firm-specific characteristics such as firm size, market to book, and leverage affect the level of accounting conservatism (e.g., Khan & Watts, 2009). This study estimates the target's conservatism over the five fiscal years preceding the deal announcement date. To mitigate concerns about endogeneity arising from potentially omitted correlated variables, this study adds additional controls for target firm-specific characteristics when estimating conservatism and testing hypotheses in regressions of the second stage. Specifically, this study augments Eqs. (3) and (4) by adding additional controls for target size, market to book ratio, and leverage, and interacting them with Basu (1997) conservatism measure. Therefore, the following two augmented OLS regressions are estimated:

$$
\begin{aligned}
Earn_{i,t-z}/MV_{i,t-z-1} &= \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\
&+ \beta_4 r\_TarRet_{i,t} + \beta_5 r\_TarRet_{i.t} * Dum_{i,t-z} + \beta_6 r\_TarRet_{i.t} \\
&* Ret_{i,t-z} + \boldsymbol{\beta_7 r\_TarRet_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} \\
&+ \beta_8 Size_{i,t-z} + \beta_9 Size_{i.t-z} * Dum_{i,t-z} + \beta_{10} Size_{i.t-z} \\
&* Ret_{i,t-z} + \beta_{11} Size_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{12} MTB_{i,t-z} \\
&+ \beta_{13} MTB_{i.t-z} * Dum_{i,t-z} + \beta_{14} MTB_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{15} MTB_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{16} Leverage_{i,t-z} \\
&+ \beta_{17} Leverage_{i.t-z} * Dum_{i,t-z} + \beta_{18} Leverage_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{19} Leverage_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}
\end{aligned} \tag{13}
$$

$$
\begin{aligned}
Earn_{i,t-z}/MV_{i,t-z-1} &= \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} \\
&+ \beta_4 r\_AcqRet_{i,t} + \beta_5 r\_AcqRet_{i.t} * Dum_{i,t-z} + \beta_6 r\_AcqRet_{i.t} \\
&* Ret_{i,t-z} + \boldsymbol{\beta_7 r\_AcqRet_{i.t} * Dum_{i,t-z} * Ret_{i,t-z}} \\
&+ \beta_8 Size_{i,t-z} + \beta_9 Size_{i.t-z} * Dum_{i,t-z} + \beta_{10} Size_{i.t-z} \\
&* Ret_{i,t-z} + \beta_{11} Size_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{12} MTB_{i,t-z} \\
&+ \beta_{13} MTB_{i.t-z} * Dum_{i,t-z} + \beta_{14} MTB_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{15} MTB_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \beta_{16} Leverage_{i,t-z} \\
&+ \beta_{17} Leverage_{i.t-z} * Dum_{i,t-z} + \beta_{18} Leverage_{i.t-z} * Ret_{i,t-z} \\
&+ \beta_{19} Leverage_{i.t-z} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}
\end{aligned} \tag{14}
$$

The results of estimating these two models are presented in Table 5.9. The results are robust to including additional controls for target firm-specific characteristics. The results show that target (acquirer) returns decrease (increase) when the target's conservative accounting increases.

5.7.5 Controlling for target's ex ante asymmetric information

Asymmetric information of the target firm is found to affect acquisition outcomes. For instance, Dionne et al. (2015) find that bidders who are less influenced by the target's asymmetric information, as proxied by bidders who have substantial toeholds in the target firm prior to the acquisition (i.e., blockholders), offer lower premiums to target shareholders. McNichols and Stubben (2015) show that uncertainty over the value of the target firm is negatively associated with acquirer returns. Therefore, to mitigate the probable confounding effect of the target's asymmetric information on the association between the target's conservatism and target and acquirer returns, this study includes the target's asymmetric information in first-stage regressions (Eq. (2)) as a control variable. This study uses the target's idiosyncratic stock return volatility, *Tar_Vol*, to proxy for the target's asymmetric information. *Tar_Vol* is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Residuals obtained from first-stage regressions are then interacted with Basu measure of conservatism in second-stage regressions to test hypotheses. The results of testing hypotheses are reported in Table 5.10 and they are consistent with those of the main analysis.

Table 5.9
Testing hypotheses with controlling for potentially omitted correlated variables

Variables	Y= Earnings		Y= Accruals		Y= Accruals	
	1	2	3	4	5	6
Intercept	0.057***	0.044**	-0.122***	-0.154***	-0.075***	-0.092***
	(4.868)	(2.174)	(-5.814)	(-3.478)	(-3.633)	(-2.679)
Dum	0.012	0.022	0.006	0.065	-0.032	-0.018
	(0.726)	(0.766)	(0.190)	(0.981)	(-1.151)	(-0.337)
Ret	0.060**	0.041	0.019	0.038	-0.020	-0.020
	(2.210)	(0.799)	(0.521)	(0.428)	(-0.682)	(-0.344)
*Dum*Ret*	0.317***	0.319***	0.125*	0.163	0.024	-0.028
	(7.035)	(3.635)	(1.663)	(0.841)	(0.437)	(-0.239)
r_TarRet	-0.008		-0.041		-0.009	
	(-0.430)		(-1.464)		(-0.381)	
*r_TarRet*Dum*	0.008		0.012		-0.029	
	(0.319)		(0.292)		(-0.780)	
*r_TarRet*Ret*	0.082**		0.103**		0.070*	
	(2.135)		(2.051)		(1.822)	
r_TarRet*Dum*Ret	**-0.123****		**-0.225****		**-0.191*****	
	(-1.982)		**(-2.538)**		**(-2.616)**	
r_AcqRet		-0.047		0.153		0.036
		(-0.681)		(1.363)		(0.340)
*r_AcqRet*Dum*		0.133		-0.028		0.066
		(1.432)		(-0.175)		(0.438)
*r_AcqRet*Ret*		0.069		-0.540***		-0.262**
		(0.524)		(-3.156)		(-2.379)
r_AcqRet*Dum*Ret		**0.114**		**0.656***		**0.519***
		(0.480)		**(1.726)**		**(1.920)**
Size	0.004**	0.007**	0.011***	0.016***	0.005	0.007
	(2.135)	(2.149)	(3.254)	(2.661)	(1.624)	(1.374)
*Size*Dum*	-0.005*	-0.006	-0.002	-0.012	0.005	0.004
	(-1.652)	(-1.343)	(-0.347)	(-1.273)	(1.080)	(0.468)
*Size*Ret*	-0.005	-0.004	-0.008	-0.015	-0.001	-0.004
	(-1.149)	(-0.436)	(-1.321)	(-1.275)	(-0.200)	(-0.507)
*Size*Dum*Ret*	-0.037***	-0.030**	-0.023*	-0.020	-0.005	0.007
	(-4.527)	(-2.057)	(-1.727)	(-0.696)	(-0.443)	(0.388)
MTB	-0.010***	-0.008***	0.004***	0.004**	0.003***	0.006***
	(-7.015)	(-3.484)	(2.702)	(2.329)	(2.600)	(3.439)
*MTB*Dum*	0.002	0.000	0.000	-0.002	0.000	-0.004
	(0.930)	(0.024)	(0.028)	(-0.782)	(0.121)	(-1.459)
*MTB*Rey*	-0.002	-0.002	0.002	0.003	0.002**	0.002
	(-1.107)	(-0.625)	(1.581)	(1.131)	(2.060)	(1.055)
*MTB*Dum*Ret*	-0.006	-0.012*	-0.007	-0.026***	-0.000	-0.012**
	(-0.859)	(-1.923)	(-0.595)	(-3.138)	(-0.020)	(-2.070)
Leverage	-0.021	-0.052*	-0.070**	-0.078*	-0.134***	-0.165***
	(-0.959)	(-1.878)	(-2.160)	(-1.765)	(-4.337)	(-3.492)
*Leverage*Dum*	0.041	0.065	-0.001	0.066	-0.045	0.028
	(1.354)	(1.623)	(-0.022)	(0.788)	(-0.847)	(0.341)
*Leverage*Ret*	0.049	0.053	-0.203***	-0.256***	-0.215***	-0.200***
	(1.104)	(0.793)	(-3.066)	(-2.660)	(-5.189)	(-2.950)
*Leverage*Dum*Ret*	0.082	0.042	0.537***	0.768***	0.339***	0.443**
	(1.047)	(0.355)	(4.069)	(3.060)	(2.855)	(2.400)
N	6,135	2,242	4,626	1,766	3,515	1,235
R-squared	0.173	0.130	0.080	0.093	0.121	0.154

This table presents the results of additional analyses aimed to mitigate concerns about endogeneity. It presents the results of testing hypotheses using augmented versions of Eqs. (3) and (4) and using the earnings-based Basu (1997) measure of conservatism. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. Earnings, returns and firm-specific characteristic (size, MTB, and leverage) are winsorised at the 1% and 99% levels to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

Table 5.10
Controlling for target's ex ante asymmetric information
Panel A: First-stage regressions

Variables	*Dep. Var. = TarRet*	*Dep. Var. = AcqRet*
Intercept	0.036	-0.088
	(0.527)	(-1.170)
Tar_Size	-0.037***	0.003
	(-6.702)	(0.436)
Tar_MTB	-0.004	0.001
	(-1.598)	(0.471)
Tar_Lev	0.070*	-0.043*
	(1.705)	(-1.857)
Tar_ROE	-0.026	-0.030
	(-1.119)	(-1.640)
Tar_Vol	**0.826**	**-0.072**
	(1.394)	**(-0.174)**
Acq_Size	0.029***	-0.013*
	(6.252)	(-1.963)
Acq_MTB	0.004	-0.003
	(1.409)	(-1.400)
Acq_Lev	-0.029	0.056**
	(-0.659)	(2.423)
Acq_ROE	0.003	0.061***
	(0.066)	(2.943)
Tender	0.029	0.012
	(1.458)	(0.830)
Competition	-0.060***	-0.005
	(-2.942)	(-0.282)
Hostile	0.083	0.014
	(1.139)	(0.625)
Cash	0.035**	0.038***
	(2.029)	(3.115)
Stock	-0.022	0.001
	(-1.571)	(0.160)
SameInd	-0.008	0.003
	(-0.616)	(0.383)
N	1,434	521
R-squared	0.227	0.309
Year FE	Included	Included
Industry FE	Included	Included

Panel B: Second-stage regressions: Testing hypotheses using Basu (1997)

Variables	Y= Earnings		Y= Accruals		Y= Accruals	
	1	2	3	4	5	6
Intercept	0.060***	0.062***	-0.071***	-0.070***	-0.065***	-0.073***
	(19.578)	(12.458)	(-13.641)	(-7.152)	(-12.612)	(-8.055)
Dum	0.001	0.002	0.007	0.011	0.000	0.008
	(0.213)	(0.337)	(0.893)	(0.758)	(0.013)	(0.621)
Ret	0.006	0.001	-0.028***	-0.070***	-0.025***	-0.048**
	(0.779)	(0.091)	(-2.625)	(-2.815)	(-2.636)	(-2.489)
*Dum*Ret*	0.199***	0.188***	0.105***	0.161***	0.053***	0.059*

	(15.144)	(7.996)	(5.010)	(3.416)	(3.086)	(1.805)
r_TarRet	-0.017		-0.024		-0.001	
	(-0.827)		(-0.875)		(-0.049)	
*r_TarRet*Dum*	0.013		-0.008		-0.039	
	(0.484)		(-0.197)		(-1.010)	
*r_TarRet*Ret*	0.091**		0.076		0.058	
	(2.129)		(1.537)		(1.326)	
r_TarRet*Dum*Ret	**-0.160****		**-0.205****		**-0.170****	
	(-2.434)		**(-2.235)**		**(-2.155)**	
r_AcqRet		-0.052		0.216*		0.119
		(-0.769)		(1.684)		(1.000)
*r_AcqRet*Dum*		0.139		-0.071		-0.016
		(1.505)		(-0.410)		(-0.098)
*r_AcqRet*Ret*		0.131		-0.725***		-0.466***
		(1.102)		(-2.897)		(-2.729)
r_AcqRet*Dum*Ret		**0.082**		**0.906****		**0.675****
		(0.341)		**(2.112)**		**(2.161)**
N	6,168	2,249	4,644	1,771	3,530	1,239
R-squared	0.120	0.093	0.011	0.028	0.011	0.034

This table reports the results of testing hypotheses with controlling for the target's ex ante asymmetric information. Panel A presents first-stage regressions, i.e., Eq. (2), with incorporating the target's stock return volatility amongst the control variables. Panel B shows the results of second-stage regressions testing hypotheses. *Tar_Vol* is estimated as the standard deviation of the target's daily abnormal returns over a period of 200 trading days ending three calendar months prior to the deal announcement date (i.e., the trading-day window: -263, -64). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Variable definitions are provided in Table A.5.1 in the appendix of this chapter. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

5.8 Summary

The literature documents that target shareholders typically earn large positive abnormal returns while acquirer shareholders achieve negative, zero, or mildly positive abnormal returns around the announcement of M&A transactions (see, for example, Andrade et al., 2001; Eckbo, 2009 for a review of the empirical evidence). A main explanation is that bidders overestimate the true value of the target firm and that the winning bidder is typically the one who most excessively overestimates this value, i.e., the winner's curse problem (Capen et al., 1971; Roll, 1986). The probability that a bidder falls in the winner's curse increases when uncertainty about the target's value increases (Capen et al., 1971; Varaiya & Ferris, 1987; McNichols & Stubben, 2015). This uncertainty would increase when information asymmetry of the target firm increases.

This study argues that accounting conservatism of the target firm affects the wealth of shareholders of both the target and acquiring firms by mitigating consequences

of the target's information asymmetry on shareholder wealth. Therefore, this study examines the association between accounting conservatism of the target firm and the market reaction of both the target and acquiring firms to the announcement of the M&A deal. As the acquirer's overpayment to target shareholders would be differently perceived by target and acquirer shareholders, this study predicts contrasting effects of the target's conservative reporting on target and acquirer returns.

Using a sample of completed M&A deals between public U.S. firms that were announced over the period 1984-2017, this study provides evidence that accounting conservatism of the target firm is associated with the wealth of shareholders of both the target and acquiring firms participating in the M&A deal. In particular, this study finds that accounting conservatism of the target firm is negatively associated with abnormal returns accrued to target shareholders around the deal announcement date. This result suggests that the role of the target's accounting conservatism in mitigating the acquirer's overpayment is negatively perceived by shareholders of the target firm. Therefore, target returns decrease when target firms adopt higher levels of conservative accounting practices over the years preceding the announcement of M&A deals.

However, this study finds a positive association between accounting conservatism of the target firm and abnormal returns for shareholders of the winning acquirer. This result suggests that shareholders of the winning acquirer positively perceive the role of the target's conservative reporting in alleviating the adverse consequences of the target's information asymmetry on the likelihood of the acquirer's overpayment to target shareholders. Thus, acquirer returns around the deal announcement increase with the increase in the target's conservative reporting.

The results of this study are robust to a battery of sensitivity checks including: (1) the use of two alternative measures of accounting conservatism; (2) using a different specification of estimating abnormal returns; (3) the use of an alternative research design; (4) controlling for additional variables to account for endogeneity concerns; and (5) controlling for the ex ante information asymmetry of the target firm.

Appendix to Chapter 5

Table A.5.1
Variable definitions

Variable	Definition	Data source
a) Takeover gains and residuals		
Tar_Ret	Cumulative abnormal returns of the target firm over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each target are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to estimate the market model	CRSP daily stock file
Acq_Ret	Cumulative abnormal returns of the acquirer over a 3-day event window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Parameters of the market model for each acquirer are estimated over a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to estimate the market model	CRSP daily stock file
r_Tar_Ret	The unexplained part (residual) of target announcement returns obtained from the first-stage regression using ***Tar_Ret***.	
r_Acq_Ret	The unexplained part (residual) of acquirer announcement returns obtained from the first-stage regression using ***Acq_Ret***.	
b) Basu (1997) measure of conservatism		
Ret	The target's market-adjusted annual stock return computed by compounding monthly market-adjusted returns, including dividends, over the fiscal year (CRSP monthly stock file items: *ret* adjusted by the value-weighted market return, *vwretd*)	CRSP monthly stock file
Earn	The target's net income before extraordinary and exceptional items (Compustat item: *ib*)	Compustat
Acc	The target's operating accruals, calculated as earnings before extraordinary and exceptional items (Compustat item: ib) minus cash flows from continuing operations (Compustat items: [oancf – xidoc])	Compustat
MV	The target's market value of equity (Compustat items: *prcc_f* * *csho*)	Compustat
Dum	An indicator variable that equals one if the target's market-adjusted annual stock return, *Ret*, is negative, and zero otherwise	CRSP monthly stock file

c) Target characteristics

Tar_Size	The natural logarithm of the target's market capitalisation at the end of the fiscal year prior to the deal announcement date [prcc_f*csho]	*Compustat*
Tar_MTB	The ratio of the target's market value of equity to its book value of equity at the end of the fiscal year prior to the deal announcement date [(prcc_f*csho)/ceq]	Compustat
Tar_Lev	The ratio of the target's long-term debt and short-term debt to total assets at the end of the fiscal year prior to the deal announcement date [(dltt+dlc)/at]	Compustat
Tar_ROE	The ratio of the target's income before extraordinary items to its book value of equity at the end of the fiscal year prior to the deal announcement date [ib/ceq]	Compustat

d) Acquirer characteristics

Acq_Size	The natural logarithm of the acquirer's market capitalisation at the end of the fiscal year prior to the deal announcement date [prcc_f*csho]	Compustat
Acq_MTB	The ratio of the acquirer's market value of equity to book value of equity at the end of the fiscal year prior to the deal announcement date [(prcc_f*csho)/ceq]	Compustat
Acq_Lev	The ratio of the acquirer's long-term debt and short-term debt to total assets at the end of the fiscal year prior to the deal announcement date [(dltt+dlc)/at]	Compustat
Acq_ROE	The ratio of the acquirer's income before extraordinary items to its book value of equity at the end of the fiscal year prior to the deal announcement date [ib/ceq]	Compustat

e) Deal Characteristics

Hostile	An indicator variable that equals one if the deal is classified by TR Eikon as a hostile or unsolicited, and zero otherwise	TR Eikon
Competition	An indicator variable that equals one if two or more bidders are involved in the deal, and zero otherwise	TR Eikon
Tender	An indicator variable that equals one if the deal is classified by TR Eikon as a tender, and zero otherwise	TR Eikon
Cash	An indicator variable that equals one if 90% or more of the deal consideration is paid using cash, and zero otherwise	TR Eikon
Stock	An indicator variable that equals one if 90% or more of the deal consideration is paid using the acquirer's shares, and zero otherwise	TR Eikon
SameInd	An indicator variable that equals one if both the target and the acquirer belong to the same two-digit SIC industry classification, and zero otherwise	TR Eikon

Table A.5.2
Target's conservatism and acquirer returns when using different ratios of the relative market size of the target to the acquirer as a cut-off

Panel A: Controlling for confounding effects: the first-stage regression

$$AcqRet_{i,t} = \alpha_0 + \alpha_1 Tar\_Size_{i,t-1} + \alpha_2 Tar\_MTB_{i,t-1} + \alpha_3 Tar\_Lev_{i,t-1} + \alpha_4 Tar\_ROE_{i,t-1} + \alpha_5 Acq\_Size_{i,t-1} + \alpha_6 Acq\_MTB_{i,t-1} + \alpha_7 Acq\_Lev_{i,t-1} + \alpha_8 Acq\_ROE_{i,t-1} + \alpha_9 Tender_{i,t} + \alpha_{10} Competition_{i,t} + \alpha_{11} Hostile_{i,t} + \alpha_{12} Cash_{i,t} + \alpha_{13} Stock_{i,t} + \alpha_{14} SameInd_{i,t} + \mu_n Year\ dummies + \lambda_n Industry\ dummies + \varepsilon_{i,t}$$

VARIABLES	*Dep. Var. = AcqRet*	
	Rel. Mark. Size = 15%	*Rel. Mark. Size = 25%*
Intercept	-0.095*	-0.021
	(-1.752)	(-0.262)
Tar_Size	0.000	0.002
	(0.007)	(0.206)
Tar_MTB	-0.001	0.001
	(-0.449)	(0.339)
Tar_Lev	-0.037*	-0.049*
	(-1.779)	(-1.912)
Tar_ROE	-0.014	-0.025
	(-0.958)	(-1.304)
Acq_Size	-0.007	-0.011
	(-1.393)	(-1.563)
Acq_MTB	-0.002	-0.002
	(-1.255)	(-0.958)
Acq_Lev	0.059***	0.054**
	(2.866)	(2.013)
Acq_ROE	0.046**	0.052**
	(2.229)	(2.297)
Tender	-0.000	0.009
	(-0.027)	(0.597)
Competition	-0.004	-0.002
	(-0.235)	(-0.116)
Hostile	0.014	0.015
	(0.713)	(0.560)
Cash	0.040***	0.037***
	(3.958)	(2.730)
Stock	-0.002	-0.002
	(-0.299)	(-0.245)
SameInd	0.001	0.006
	(0.189)	(0.602)
Year FE	Included	Included
Industry FE	Included	Included
N	632	439
R-squared	0.264	0.350

Panel B: Target's conservative accounting and acquirer returns (H_2): Second-stage regressions – the relative market size of the target to the acquirer = 15%

$$Earn_{i,t-z}/MV_{i,t-z-1} \text{ or } Acc_{i,t-z}/MV_{i,t-z-1} = \beta_0 + \beta_1 Dum_{i,t-z} + \beta_2 Ret_{i,t-z} + \beta_3 Dum_{i,t-z} * Ret_{i,t-z} + \beta_4 r\_AcqRet_{i,t} + \beta_5 r\_AcqRet_{i.t} * Dum_{i,t-z} + \beta_6 r\_AcqRet_{i.t} * Ret_{i,t-z} + \beta_7 r\_AcqRet_{i.t} * Dum_{i,t-z} * Ret_{i,t-z} + \varepsilon_{i,t-z}$$

Coeff.	Variables	Pred. sign	*Y= Earnings*	*Y= Accruals*	*Y= Accruals*
			1	*2*	*3*
β_0	*Intercept*	?	0.064***	-0.074***	-0.074***
			(14.519)	(-8.310)	(-8.575)
β_1	*Dum*	?	0.004	0.012	0.007
			(0.615)	(0.937)	(0.543)
β_2	*Ret*	?	0.005	-0.062***	-0.043**
			(0.473)	(-2.933)	(-2.477)
β_3	*Dum*Ret*	+	0.194***	0.159***	0.061**
			(9.309)	(3.849)	(2.051)
β_4	*r_AcqRet*	?	-0.000	0.189	0.108
			(-0.001)	(1.620)	(0.967)
β_5	*r_AcqRet*Dum*	?	0.056	-0.173	-0.130
			(0.659)	(-1.111)	(-0.852)
β_6	*r_AcqRet*Ret*	?	0.061	-0.679***	-0.496***
			(0.602)	(-2.923)	(-2.816)
β_7	***r_AcqRet*Dum*Ret***	+	**0.060**	**0.648***	**0.500***
			(0.287)	**(1.706)**	**(1.728)**
N			2,743	2,113	1,466
R-squared			0.106	0.027	0.032

Panel C: Target's conservative accounting and acquirer returns (H_2): Second-stage regressions – the relative market size of the target to the acquirer = 25%

Coeff.	Variables	Pred. sign	*Y= Earnings*	*Y= Accruals*	*Y= Accruals*
			1	*2*	*3*
β_0	*Intercept*	?	0.059***	-0.072***	-0.077***
			(11.314)	(-7.044)	(-8.219)
β_1	*Dum*	?	0.003	0.007	0.010
			(0.336)	(0.430)	(0.750)
β_2	*Ret*	?	0.003	-0.067***	-0.039**
			(0.208)	(-2.708)	(-2.108)
β_3	*Dum*Ret*	+	0.171***	0.149***	0.049
			(7.007)	(2.999)	(1.489)
β_4	*r_AcqRet*	?	-0.074	0.162	0.100
			(-1.047)	(1.146)	(0.760)
β_5	*r_AcqRet*Dum*	?	0.172*	0.024	0.062
			(1.768)	(0.126)	(0.350)
β_6	*r_AcqRet*Ret*	?	0.127	-0.732***	-0.461**
			(1.047)	(-2.834)	(-2.556)
β_7	***r_AcqRet*Dum*Ret***	+	**0.015**	**1.003****	**0.802****
			(0.060)	**(2.152)**	**(2.509)**
N			1,886	1,500	1,058
R-squared			0.080	0.027	0.031

This table presents the results of testing the association between the target's accounting conservatism and acquirer returns when using different ratios of the relative market size of the target to the acquirer as a cut-off (15% and 25%).

Panel A reports the results of first-stage regressions used to control for confounding variables. *AcqRet* is acquirer returns and is estimated as the cumulative abnormal returns of the acquirer over a 3-day event

window (-1, +1), centred on the day of the deal announcement (day 0). Abnormal returns are estimated using the market model and the CRSP value-weighted returns as the market index. Coefficients of the market model are estimated using a window of 200 trading days ending 64 days prior to the acquisition announcement date (i.e., from day -263 to day -64). Firms must have available stock returns data for at least 100 trading days to be considered.

Panels B and C present the results of second-stage regressions when residual acquirer returns are interacted with variables of Basu (1997) models. Columns (1), (2) and (3) present the results when using the earnings-based Basu (1997) model, the accruals-based Basu measure with all deals, and the accruals-based Basu measure with excluding deals involving targets belonging to financial and utility industries, respectively. *r_AcqRet* refers to residuals of acquirer returns and is obtained from first-stage regressions of control variables on acquirer returns, *AcqRet*.

Variable definitions are provided in Table A.5.1 in the appendix of this chapter. All continuous variables are winsorised at the 1% and 99% levels to minimise the effect of outliers. *t*-statistics are reported under coefficients (in parentheses). *t*-statistics are based on robust standard errors clustered by year and target-firm to correct for time-series and cross-section correlations (Petersen, 2009). Reported *p*-values are based on two-tailed tests. *, **, and *** denote statistical significance levels of 10%, 5%, and 1%, respectively.

Chapter 6

Conclusion

6.1 Findings of the study

This thesis provides evidence on the economic consequences of information asymmetry and accounting conservatism in the M&A market. M&A transactions represent one of the most influential events for corporations over their lifecycles. They incorporate the transfer of massive economic resources between entities in the economy. These transactions are typically seen as value-creating for target shareholders but value-destroying or value-neutral for acquirer shareholders. The reasons behind the value-effects of these transactions represent one of the long-standing puzzles within the academics', practitioners', and policymakers' circles. This thesis aims to extend our knowledge of the drivers of the dynamics, value-effects, and other outcomes of M&A transactions. Over the three main empirical chapters, this thesis explores the effects of two aspects of the quality of information available to the acquirer (the buyer) about the target (the seller) on the takeover premium, shareholder wealth of the merging parties, the total efficiency of the acquisition investment decision, merger completion and renegotiation, and the long-term performance of acquiring firms.

Chapter 3 investigates whether uncertainty about the target's intrinsic value arising from the target's ex ante information asymmetry affects merger outcomes. Using the target's idiosyncratic stock return volatility, bid-ask spread and R&D intensity to proxy for the target's information asymmetry, and using a large sample of 3,789 M&A deals between U.S. publicly traded firms announced over the period 1986-2017, this chapter finds that the target's information asymmetry is positively associated with the premium offered by bidding firms. This result suggests that when uncertainty about the target's value arising from information asymmetry increases, bidding firms bid less effectively and incur larger premiums. More importantly, the results show that target shareholders earn higher abnormal stock returns upon the announcement of M&A deals when the target's information asymmetry is high. However, bidder announcement returns, as well as combined announcement returns of portfolios of targets and bidders,

are significantly lower in deals involving target firms with high information asymmetry. These results indicate that while target shareholders more positively react to M&A transactions when target firms have high levels of information asymmetry, bidder shareholders perceive these transactions as less profitable and, therefore, negatively react to the announcement of these deals.

Furthermore, the findings reveal that deals are more likely to be terminated when target firms have high levels of information asymmetry. The findings also demonstrate that the target's information asymmetry increases the likelihood of the downward renegotiation of the initial deal price. These findings denote that some bidders rationally react to the high uncertainty of deals involving target firms with high information asymmetry and, therefore, decide to terminate or, at least, renegotiate their deals. Finally, this chapter finds that bidders in completed deals involving target firms with high information asymmetry are more likely to post-acquisition report goodwill impairment losses, suggesting that the target's information asymmetry negatively influence the long-term performance of acquiring firms. Taken together, the findings of Chapter 3 suggest that target shareholders benefit from the target's ex ante information asymmetry at the expense of acquirer shareholders, and that the target's information asymmetry affects the acquirer's decisions to consummate and renegotiate the deal, as well as the acquirer's long-term performance.

Chapter 4 explores the association between accounting conservatism of the target firm and the takeover premium offered by the winning acquirer to target shareholders. To achieve this, the chapter primarily employs a two-stage approach to mitigate endogeneity and multicollinearity concerns, and uses a sample of 1,434 completed M&A deals between U.S. publicly traded firms announced over the period 1986-2017. In addition, to capture the commitment of target firms for adopting conservative accounting, the chapter mainly estimates accounting conservatism using the Basu (1997) asymmetric timeliness measure over the five-year period preceding the acquisition announcement date. The results show that the target's conservative accounting is negatively associated with the takeover premium, indicating that acquirers incur lower premiums when target firms are more conservative in their financial reporting over the years leading to the acquisition. This result suggests that bidders bid more effectively in the M&A market and are less likely to overpay to target shareholders when target firms adopt more conservative accounting practices.

Moreover, Chapter 4 assesses whether the association between the target's conservative accounting and the takeover premium cross-sectionally differs based on the level of the target's ex ante information asymmetry. The findings reveal that the negative association between the target's conservative accounting and the takeover premium only holds, and is more pronounced, when the target's stock return volatility is high, bid-ask spread is high, or the target size is small. The results of Chapter 4 suggest that the target's conservative accounting helps bidders to bid more effectively and value the target firm more precisely by mitigating the adverse consequences of high uncertainty about the target's value. These results are consistent with the predictions of the winner's curse and the divergence of opinions among bidders that the winning acquirer is likely to incur larger premiums when uncertainty about the target's intrinsic value is high.

Finally, Chapter 5 examines whether accounting conservatism of the target firm is associated with shareholder wealth of both the target and acquiring firms, as reflected by the stock market reactions to the announcement of M&A deals. The results show a negative association between a target's conservative accounting and target announcement returns. Specifically, the results show that accounting conservatism of target firms is negatively associated with cumulative abnormal returns for target shareholders around the M&A deal announcement date. This result suggests that the positive market reaction by target shareholders to the announcement of M&A deals decreases with the increase in the level of conservative accounting of target firms.

In contrast, while avoiding overpayment by the winning acquirer is expected to be negatively perceived by target shareholders, it is expected to be positively perceived by acquirer shareholders. Consistent with this prediction, the results demonstrate that the target's conservative accounting is positively associated with cumulative abnormal returns for shareholders of the winning acquirer around the deal announcement date, indicating that acquirer announcement returns are higher when financial reporting of the target firm is more conservative. Thus, Chapter 5 provides evidence that conservative accounting of the target firm affects shareholder wealth of both the target and the acquirer and that while it is costly for target shareholders, it is beneficial for acquirer shareholders.

6.2 Research implications

The findings of this thesis have several important implications for shareholders, managers, and policymakers. With respect to shareholders, this thesis stresses the

importance of the quality of information available about the target firm in shaping the acquisition investment decision of the acquiring firm. The findings suggest that bidders might be vulnerable to overpay in M&A transactions when target firms have high levels of information asymmetry and low quality of accounting information. Therefore, shareholders of bidding firms are encouraged to pay close attention to the quality of investment decisions made by managers of their holding companies and whether managers consider the quality of information available to them about investment opportunities. This also emphasises the importance of the monitoring role of shareholders for managers' acquisition investment decisions. Shareholders might exercise and enhance their monitoring role through, for instance, their voting rights and activism. By considering the quality of information available about investment opportunities and exercising their monitoring role, shareholders could play a vital role in deterring managers from making poor investment decisions that could be rooted in agency conflicts or behavioural biases.

This thesis also has valuable implications for managers, particularly those of acquiring firms. This thesis suggests that managers of acquiring firms should consider discounting the values of target firms in M&A transactions when target firms have high levels of uncertainty that might be due to the ex ante information asymmetry or the low quality of accounting information. This is in line with the predictions of the winner's curse explanation in M&A transactions that high uncertainty about the target's intrinsic value increases the possibility that the winning acquirer overpays to target firms. This thesis also urges managers of the acquiring firm to benefit most from, and exert more efforts during, the different stages of the due diligence process to verify that there are no material adverse risks that are not cleared out by the target's managers and financial reports.

Moreover, this thesis suggests that managers of acquiring firms should consider learning from the market and, therefore, cater to the needs and demands of shareholders. The findings show that the market negatively reacts to deals involving target firms with high levels of uncertainty and that acquirers in these deals are more likely to ex post report goodwill impairment losses, which might indicate that bidder managers previously overestimated the values of these target firms. Thus, the evidence in this thesis supports the theory suggested by Luo (2005) that insiders should learn from outsiders in making the decision of consummating a deal or not. Finally, this thesis advises managers to realise the crucial role of having credible information about their investment opportunities in

shaping their pricing decisions of these investments and, consequently, the market reaction to them. In the context of M&A transactions, acquirer managers should pay close attention to whether target firms are committed to conservatively report their financial reports or not over the years preceding the acquisition.

This thesis also has important implications for academics and researchers. This thesis disentangles the mixed evidence in prior studies regarding the exact effects of the target's ex ante asymmetric information on M&A outcomes. The findings show that the target's asymmetric information negatively influences the short- and long-term performance of acquiring firms for the benefit of target shareholders. These findings suggest that future research should consider controlling for the quality of information available about target firms, alongside other firm-specific characteristics such as the target firm size, leverage, market to book ratio, etc., when examining the effects of the characteristics of the target firm on merger outcomes to mitigate endogeneity concerns arising from correlated omitted variables.

In addition, this thesis adds to the long debate among researchers on the benefits and costs of accounting conservatism for different users of accounting information. Researchers advocating only for the value relevance of accounting information usually consider conservatism as a less favourable characteristic of accounting information. However, researchers who promote both the value relevance and stewardship approaches contend the importance of accounting conservatism in mitigating the adverse effects of agency conflicts between different parties. This thesis suggests that accounting conservatism plays a crucial role in the efficient allocation of economic resources in the economy. The findings show that conservatism of the target firm helps the acquiring firm to bid more effectively through mitigating the adverse consequences of the target's ex ante information asymmetry. Thus, this thesis promotes a new role for accounting conservatism in solving the contrasting interests of the two agents of both the target and the acquirer.

Furthermore, the evidence in this thesis urges researchers to further explore other information sources and qualities acquirer managers should consider when bidding for a specific target so that they would mitigate the adverse effects of the target's information asymmetry. Another broad area that should be tackled by future research is the governance techniques that acquirer shareholders could employ to monitor the investment decisions of acquirer managers. The following section addresses several avenues for future research in more detail.

Finally, this thesis has an important implication for policymakers. Accounting conservatism has been a controversial issue in the accounting standard-setting circle. A long-standing debate has been on its benefits and costs. In their joint project in 2010, the Financial Accounting Standard Board (FASB) and the International Accounting Standard Board (IASB) eliminated the conservatism/prudence principle from the conceptual framework as a qualitative characteristic of accounting information. They claim that accounting conservatism makes accounting information biased and that it is not compatible with the neutrality of accounting information. In December 2012, the IASB restarted its discussion of the conceptual framework as the IASB-only project, and the concept of prudence (i.e., conservatism) was reintroduced in the last revision of the IASB Conceptual Framework in March 2018. However, the U.S. GAAP does not follow this. Therefore, in support of the decision of the IASB in 2018, this thesis provides evidence that accounting conservatism plays an important role in the efficient capital allocation of economic resources by mitigating the adverse consequences of information asymmetry between target and acquiring firms in the market for corporate control.

6.3 Limitations of the study

The findings of this thesis should be interpreted taking into consideration the following caveats. First, both information asymmetry and accounting conservatism of the target firm are unobservable constructs and their measures are vulnerable to measurement errors. To mitigate this concern, this thesis uses three proxies for the target's information asymmetry in Chapter 3: the target's stock return volatility, bid-ask spread and R&D intensity. In Chapters 4 and 5, this thesis estimates accounting conservatism using two versions of Basu (1997) model in the primary analysis as well as two alternative measures (Ball and Shivakumar (2005) model and Khan and Watts (2009) C-Score) in the robustness check. Nevertheless, the inferences of this thesis should be considered with respect to the extent to which these measures accurately capture information asymmetry and conservative accounting of the target firm.

Additionally, both information asymmetry and accounting conservatism are endogenously determined. This thesis has considered mitigating endogeneity concerns to a great extent. For instance, to mitigate endogeneity concerns arising from simultaneous causality, when estimating stock return volatility and bid-ask spread used as proxies for the target's information asymmetry in Chapter 3, this thesis uses estimation periods that

end three months prior to the acquisition announcement date, which are sufficiently removed from any potential changes in the target's share price during the period prior to the deal announcement date. In Chapters 4 and 5, this thesis uses a window of five years when estimating accounting conservatism of the target firm. In addition, to mitigate endogeneity concerns arising from omitting correlated variables, in Chapters 4 and 5, this thesis uses Basu (1997) model as the primary measure of conservatism instead of Khan and Watts (2009) C-Score that would be more vulnerable to endogeneity biases because of its dependence on the firm-specific characteristics in its estimation. This thesis has also considered controlling for several variables found in the literature to influence the examined dependent variables both in the primary and sensitivity analyses of all empirical chapters. Furthermore, this thesis utilises specific research methodologies (such as the two-stage approach) and several measures of information asymmetry and accounting conservatism (as mentioned in the previous paragraph) to reduce concerns about endogeneity arising from errors-in-variables. Despite the considerable effort to mitigate biases resulting from the endogenous nature of variables, it is not possible to completely rule out these concerns.

Finally, in addressing its research questions, this thesis depends on a sample of M&A deals between U.S. publicly traded firms. Therefore, it is unclear whether the findings of this thesis could be generalised to M&A deals undertaken between firms in other countries with different institutional and regulatory backgrounds or to deals undertaken between firms from different countries (i.e., cross-border deals). In addition, the inferences might not be extended to other M&A deals that include privately held target or acquiring firms. Therefore, this limitation opens up avenues for further investigation.

6.4 Scope for further research

This thesis offers several promising avenues for future research. First, the findings of this thesis are interpreted based on the predictions of a two-faceted theoretical framework that comprises the principal-agent conflicts and the winner's curse/behavioural biases. That is, better information available about the target firm would strengthen the monitoring role of the acquirer's board of directors regarding eliminating acquisition decisions derived by the manager's personal motives (principal-agent conflicts). In addition, the target's better information would decrease the divergence amongst bidders regarding the true value of the target firm and managerial hubris (the winner's curse/behavioural biases).

Although the predictions are the same in the two cases that the quality of information available about the target firm decreases the risk that managers of acquiring firms overpay to target firms and undertake less profitable acquisitions, this thesis does not empirically distinguish between these two explanations. This triggers the question of which theory might play a stronger role in interpreting the effects of the target's information asymmetry and conservative accounting on M&A outcomes. This distinction would expand our understanding of the theoretical bases behind relations examined by this thesis and, hence, represent a fruitful area for future research. A suggested way to achieve this could be by examining the moderating effects of some factors that might indicate the existence of high principal-agent conflicts (e.g., firms that acquire unrelated businesses, poorly perform, have low leverage, and have excess cash flows) or high managerial hubris (e.g., firms that highly perform prior to acquisitions and measures of managerial overconfidence) on the relation between the target's information asymmetry or conservative accounting and merger outcomes.

Second, although this thesis provides evidence for the effects of the target's information asymmetry and conservative accounting on several outcomes of M&A transactions, there are still many other dynamics and outcomes of M&As that worth more investigation. For instance, if having better information about the target firm helps bidders to make better acquisition decisions, are firms with less information asymmetry / higher conservatism more likely to receive bids (i.e., become targets)? Does the target's information asymmetry/conservatism influence the contacting terms of the acquisition agreement (such as the method of payment, termination fees, earnouts, and material adverse clauses)? What is the impact of the target's information asymmetry/conservatism on the long-term market performance of the acquiring firm?

Third, the evidence in this thesis is based on a sample of M&A transactions between U.S. firms; however, it is unknown whether this evidence continues to held when examining M&A transactions in other countries with different institutional and regulatory frameworks. Furthermore, prior studies show that country-level accounting conservatism affects the capital allocation (Bushman et al., 2011) and the cost of capital (Li, 2015). In line with these studies and based on the evidence in the thesis, it is an interesting question for future research to investigate whether the country-level accounting conservatism affects the merger activity and outcomes. For instance, is the country-level conservatism associated with the acquisitiveness of firms, the takeover premium, the acquisition profitability, and the likelihood of the deal completion?

Fourth, the evidence in this thesis that the pre-acquisition commitment to conservative accounting by the target firm helps the acquirer to bid more effectively at the expense of target shareholders, particularly when the target's asymmetric information is high, provides a fertile ground for researchers to explore many unresolved issues. For instance, it is not obvious whether target managers seek to be less conservative in the latest year before the acquisition to get more benefits for their shareholders or not. It is also unclear whether being the acquisition initiated by the target firm, a setting that entails target managers' awareness and expectation of an acquisition, influences the tendency of target managers to be conservative prior to the acquisition or not. Moreover, do target managers manipulate accounting information by using non-accounting techniques, such as real earnings management, to contrast the effects of accounting conservatism on M&A outcomes?

Fifth, future research can expand the evidence of this thesis by investigating the effect of other sources of uncertainty about the intrinsic value of the target firm on the merger outcomes. For example, the literature shows that the quality of the firm's internal controls over financial reporting affects the firm's accounting quality, operations, risk, and cost of capital (e.g., Doyle et al., 2007; Skaife et al., 2008; 2009; Dhaliwal et al., 2011; Feng et al., 2015). However, prior studies do not address whether and how the quality of the target's internal controls affects the decisions of acquiring firms. Another interesting question is whether voluntary discourse (rather than mandatory disclosure) of the target or the acquirer plays a role in the M&A market. Furthermore, using a new measure of the firm-level political risk, developed by Hassan et al. (2019), it would be exciting to examine whether the political risk of the target or the acquirer affects the M&A dynamics and outcomes.

Last, the recent withdrawal of the United Kingdom from the European Union (i.e., Brexit) and the global epidemic disease of Coronavirus (Covid-19) represent two remarkable events that have huge economic consequences. The anecdotal evidence suggests that these events have influenced the M&A activity and dynamics in different countries and worldwide. Uncertainties caused by these events need to be tackled and investigated by future research to explore how these events affect the M&A activity and performance.

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