SHARED AUDITOR IN MERGERS AND ACQUISITIONS

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Abstract

Are abnormal returns in bidder and target companies higher in a merger or acquisition if the two have a shared auditor? We find that abnormal returns are higher in bidder companies but weaker in target companies with a shared auditor compared to companies without both on announcement day and days before. The rationale is that a shared auditor contributes to better informed valuation, since an auditor has a unique access to senior executives, board meetings and general information about the firm. We obtain a sample of 202 mergers and acquisitions completed in Norway between 2005 and 2017. We use an event study methodology to uncover abnormal returns around the announcement period.

Keywords: Merger and acquisition. Shared auditor. Event study. Norwegian data.

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1. Introduction

We investigate if shareholders in bidder and target firms receive an abnormal return in a acquisition or a merger when the two firms in the transaction have a shared auditor. We study the abnormal return on the announcement day, but also in up to 20 days prior to announcement. Then we investigate if the abnormal return can be related to our indicator variable shared auditor and other variables suggested in former literature, such as the firm size and "Big *N* auditor". Our main result is that the bidder firm shareholders gain from having a shared auditor while a shared auditor has a weaker relationship to abnormal returns in target firms. Being a bidder firm in a transaction involving a shared auditor gives positive abnormal returns at both the announcement date and up to 15 days prior to announcement. These results are strongly significant. The results gain further support in regressions relating abnormal returns on the announcement day to abnormal returns prior to announcement.

Early literature on mergers and acquisitions (M&A) is largely concerned with the high premium paid for the target's shares. Bulow and Klemperer (1996) put this down to the competition among bidders resulting in the "winner's curse". Roll (1986) forwards the hubris hypothesis that managers miscalculate the value of the target, while Morck, Shleifer, and Vishny (1990) underlines managers' self-serving in explaining overpaying for target shares. One way to overcome the winner's curse, managerial hubris or self-serving is to acquire a toehold in the target (Bulow, Huang, & Klemperer, 1999). In this paper, we show that a shared auditor helps the bidder to alleviate overpayment for the target's shares.

We conduct the event study on acquisitions and mergers in Norway in the 2005-2017 period. Our results are in line with former literature. Dhaliwal, Lamoreaux, Litov, and Neyland (2016) show that the bidder pays a lower premium for the control of a target company when

the bidder and the target have a shared auditor. Cai, Kim, Park, and White (2016) study the case with a shared auditor for the portfolio of bidder and target returns. In this specification, they find that the abnormal returns upon announcement is higher for firms with a shared auditor than for firms without.

The Dhaliwal et al. (2016) and Cai et al. (2016) papers both underline the role that the shared auditor or financial advisor plays as an information intermediary, and the consequent reduction in information asymmetry. Better informed valuation follows. But a shared auditor can increase the risk that information about a possible merger or acquisition can have escaped before the official announcement. Neither Dhaliwal et al. (2016) nor Cai et al. (2016) explore this possibility, limiting their investigations to price changes from one day before the announcement and to the announcement day. In this paper, we extend the analysis to include abnormal price changes for bidder and target up to 20 days before announcement day. We find that the bidder gains are evident even in the pre-announcement period.

If the information asymmetry argument is valid, we should expect that auditors have an interest in revealing information. On the benefit side, the auditor can have a short-term interest in seeing a takeover through (Dhaliwal et al., 2016). This can generate more revenue for the auditor and possibly more consultancy work. The auditor may also fear that a denial to reveal information about a potential target can induce the bidding company to change auditor. On the cost side, the auditor wants to protect its credibility as independent of parties in a takeover transaction and to avoid litigation costs. This effect is stronger the larger the auditor is (DeAngelo, 1981). Thus, from the outset the question of preponderance of beneficial effects of a shared auditor does not lead to a given conclusion. The matter is empirical.

The insight of DeAngelo (1981) that large audit firms have a stronger motivation to protect their reputational capital than smaller calls for control for a "Big *N*" variable (Hay, Knechel,

& Wong, 2006; Boone, Khurana, & Raman, 2010). Research shows that the Big *N* auditors generally perform audits with higher quality than smaller (DeFond, Erkens, & Zhang, 2017). We use a *Big 4* variable and we find that abnormal returns are lower in targets when *Big 4* auditors are engaged, as do Cai et al. (2016). On the other hand, Lawrence, Minutti-Meza, and Zhang (2011) find that the Big *N* effects disappears when client characteristics, specifically client size, are taken into account. We add company size to our variable list and find that in targets company size has a positive relationship to abnormal returns, while this is absent in bidder companies. Besides a shared auditor, other information channels in our analysis include auditor tenure, shared city, and shared industry. Auction theory implies that a bidding competition enhances abnormal returns, especially for target firms. Accordingly, we investigate if an acquisition has higher abnormal returns than a merger. Other control variables are the takeover premium, a bidder/target variable, and the riskfree rate.

Conducting an event study of M&A in a "small, open economy" can inform investors of the generality of results reached earlier. Norway is a favourable country to study acquisitions and mergers since the law puts up few barriers to this activity. The Competition Act is the central law in this area. Its paragraphs 16 to 21 says that mergers and acquisitions that may harm competition in product markets can be denied. Larger firms with more than NOK 1 billion (about USD 110 million) in sales need to notify the competition authorities, obliging them to give a decision within 70 days if the merger distorts competition. In particular, limits to foreign ownership do not exist, nor do concerns over the "national interest" stop mergers and acquisitions. In fact, foreign ownership was central in the industrialisation of Norway in the latter part of the 19th century (Stonehill, 1965). On Oslo Stock Exchange the foreign ownership share is 35-40% in the 2005-2017 period (*The Norwegian Registry of Securities,* 2019).

Furthermore, Norway has high investor protection and transparent accounting regulations. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2000) point out that strong investor protection is important for trust in a country's corporate governance. Norway ranks as 9th out of 190 countries on the World Bank Doing Business index 2020. Accounting regulations are uniform and detailed. All shareholder owned companies need to submit audited financial statements to an open, public register, "Brønnøysundregisteret". Strong investor protection and transparent accounting rules can influence a bidder company's valuation of the target. For instance, Francis and Wang (2008) find that the "Big *N* effect" is only present in countries with high investor protection.

2. Literature review and hypotheses

We investigate how a shared auditor is associated with abnormal returns in takeover transactions, and if the information leakage is larger when the auditor is the same in both bidder and target. Then we move to the investigation of how much the shared auditor contributes to abnormal returns together with other variables.

Two parties are involved in an acquisition and a merger, the *bidder* and the *target*. The bidder variable is a binary being one if the firm buys at least 50% of the shares in the target company, and the target company has a zero. We follow Betton, Eckbo, and Thorburn (2008) in keeping this convention for both acquisitions and mergers.

2.1 Abnormal returns

We set out the event study methodology from MacKinlay (1997). In general, the definition of the abnormal return is

$$AR_{it} = R_{it} - E(R_{it}|X_t) \qquad (1)$$

where AR_{it} is the abnormal, R_{it} is the actual, and $E(R_{it}|X_t)$ is the expected normal return at time *t*, given available information X_t.

The *event date* is the date of the acquisition announcement. We calculate abnormal returns for twenty days before the event date, and twenty days after the event. We define the *event window* as the period (τ_1, τ_2) reaching from some day (τ_1) before the event day to some day after the event date (τ_2). The abnormal returns are summed in the event window to arrive at the *cumulative abnormal return (CAR):*

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \qquad (2)$$

Doing so for all companies in the sample and averaging, gives the *cumulative average abnormal return (CAAR)*:

$$CAAR(\tau_1, \tau_2) = \sum_{i=1}^{n} CAR_i = \sum_{i=1}^{n} \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \qquad (3)$$

We study how *CAAR* varies over the event window for companies with and without a shared auditor. We run multivariate regressions in order to uncover factors besides the shared auditor that are importantly related to the cumulative abnormal return level. We propose a parsimonious model to capture the variation in abnormal return among firms.

2.2 The shared auditor

Our main variable of interest is the *Shared auditor*. The Dhaliwal et al. (2016) study compares the abnormal returns of bidders and targets with a shared auditor with takeover companies with separate auditors, and they find a low abnormal return for the bidder and a high return for the target. Cai et al. (2016) find that the return portfolio of bidder and target is positive. We study bidder and target separately.

Both Dhaliwal et al. (2016) and Cai et al. (2016) share the view that the shared auditor plays the role of an information intermediary in reducing uncertainty and asymmetric information between the parties. Cai et al. (2016) argue that compared to the case with different auditors, the shared auditor is in a better position to identify merger counterparties, that having a shared auditor means that the financial statements are more comparable, and that target and bidder will engage in less financial misreporting prior to the announcement. Dhaliwal et al. (2016) hold that this informational advantage leads to less bidder competition and hence, a lower takeover premium and a higher abnormal bidder return in transaction with a shared auditor compared to transaction without. Shareholders in the target companies receive a lower premium than in transactions without a shared auditor. The authors put this down to the tendency of auditors to favour the bidder in the hope of winning continued and larger audit orders later. The Dhaliwal et al. (2016) and Cai et al. (2016) arguments lead to our hypotheses about bidder and target:

H1a Bidder abnormal returns in a merger or acquisition transaction are higher when the bidder and target have a shared auditor compared to the case with separate auditors.

H1b Target abnormal returns in a merger or acquisition transaction are lower when the bidder and target have a shared auditor compared to the case with separate auditors.

Dhaliwal et al. (2016) and Cai et al. (2016) both use an event window of (-1,1). We extend the window to (-20,20). The reason is the following. Abnormal returns before the official announcement date can arise since information of a possible merger can easily escape and become shared knowledge of market participants with a third party involved, the shared auditor. Such abnormal return, “runup”, is a shared occurrence also found in event studies in different time periods and under different market conditions (Jarrell and Poulsen, 1989). The runup is the cumulative abnormal stock return in the target company prior to announcement. Eckbo (2009) notes that the runup reflects information about the target known to the bidder.

But the information should be private until the announcement date. If any information leakage occurs, we should expect a stronger runup in transactions with a shared auditor compared to transactions with different auditors. By comparing shared and different auditor transactions for bidders and targets, we can classify the stronger runup in shared auditor transactions as information leakage. Information leakage is evident in the early study of Keown and Pinkerton (1981).

Eckbo (2009) points out that the runup is due to the "substitution hypothesis", which says that the runup reflects the final offer price that the bidder is willing to post in any case. If the bidder engages in preemptive bidding, a positive association between the runup and the final takeover premium will arise. The substitution hypothesis does not rule out a positive association. Eckbo concludes that one needs more information about the bidder's price-setting process to reject the substitution hypothesis. Aspris, Foley, and Frino (2014) supply such information. They follow the ownership changes prior to the announcement date in the Australian market, where ownership disclosure rules yield continuous updating of ownership positions. They uncover a positive relationship between ownership changes and the runup in target share price prior to the announcement date. Thus, Aspris et al. (2014) confirm the substitution hypothesis that fundamental information available to the market drives the runup and the final takeover premium. We expect the runup to affect bidder and target differently and summarise:

H2a Bidder abnormal returns in the runup in a merger or acquisition transaction are higher when the bidder and target have a shared auditor compared to the case with separate auditors.

H2b Target abnormal returns in the runup in a merger or acquisition transaction are lower when the bidder and target have a shared auditor compared to the case with separate auditors.

We compare runups for all companies differentiated by their having a shared auditor or not and then extend the analysis to bidder and target firms.

The differentiation between target and bidder firms is important. Robust findings in the M&A literature are that the target shareholders experience a high and positive abnormal return and the bidder shareholders receive an abnormal return around zero or negative (e.g. Jensen and Ruback, 1983; Loderer and Martin, 1990; Akbulut and Matsusaka, 2010; Moeller, Schlingemann, and Stulz 2004; Andrade, Mitchell, and Stafford, 2001; Goergen and Renneboog 2004; Martynova and Renneboog, 2011; Alexandridis, Fuller, Terhaar, and Travlos 2013; Mulherin, Netter, and Poulsen, 2017). The findings hold for both American and European companies. However, new evidence in Alexandridis, Antypas, and Travlos (2017) reveals that after 2009 the deal improvement for bidders is substantial. The question is whether the greater information availability to parties when the auditor is shared induces higher abnormal returns for the bidder and lower for the target relative to the case when the auditor is separate.

The literature on shared auditors is small at this time of writing. However, the number of studies of information intermediaries in general is rising. For instance, transaction parties' use of an advisor, either shared or separate, appear in many studies. Evidence points towards better abnormal performance for bidder firms using a top-tier investment bank advisor in public acquisitions (Golubov, Petmezas, and Travlos, 2012). Agrawal, Cooper, Lian, and Wang (2013) study the case when bidder and target have the same advisors and confirm findings of superior abnormal performance for bidding firms. Likewise, the presence of shared directors on bidder and target boards impacts M&A outcomes. Cai and Sevilir (2012) investigate the case when bidder and target share a board member. They find that bidder returns are higher than otherwise. This is also consistent with evidence in Rousseau and Stroup (2015), who show that a "historical interlock", where a board member of the bidder

has formerly been a director in the target company, increases the likelihood of a takeover bid, but decreases the abnormal return and the variability in announcement returns for the bidder company. Stuart and Yim (2010) demonstrate the importance of board membership and their social networks for the likelihood of becoming a target in private companies. Lower variability is in line with the asymmetric information argument for the shared auditor case. The links between bidder and target also encompass the social ties that exist between CEOs and directors. An example is (Ishii and Xuan, 2014) who investigate the effects of social ties from shared educational and employment background. Brooks, Chen, and Zeng (2018) find that institutional cross-ownership enhances the probability of a merger, it reduces the deal premium, involves payment in stocks, and it lowers the probability of a merger when the acquirer has negative announcement date abnormal return. In summary, the results from studies where bidder and target are related in some way are in line with the main hypothesis of this paper.

2.3 Firm characteristics and abnormal returns

Other variables besides the shared auditor can be better related to abnormal returns. Here, we list variables suggested in the literature.

First, we note other information related variables suggested in the literature. A long-serving auditor is likely to give superior service (Myers, Myers, and Omer 2003). We include the audit tenure and expect that a long-serving auditor is better able to give valuable advice in a takeover or merger. We expect that *CAR* is higher, the longer the tenure is.

An information argument can be made for the inclusion of a same city variable (Uysal, Kedia, and Panchapagesan, 2008). Location in the same city should give higher abnormal returns for the bidder. In the same vein, the industry classification of bidder and target can be

related to abnormal returns. Morck et al. (1990) show that abnormal returns are higher when target and bidder belong to the same industry. We use the Fama industry classification.

An argument for benefits for shareholders in bidder and target companies is that the auditor acts opportunistically, seeking short-term gains. However, DeAngelo (1981) notes that the short-term opportunistic gain can be offset by long-term loss of confidence in the auditor as an independent monitor, and hence the loss of customers, if the auditor has considerable investments in personnel and human capital assets to protect. The investment is higher, the larger the auditor. Therefore, the larger the auditor is, the less opportunistically he or she will act. We capture this auditor size effect with an indicator variable *Big 4* representing Deloitte, EY, KPMG, and PWC in keeping with former literature (Hay, Knechel, & Wong, 2006; Boone, Khurana, & Raman, 2010). DeFond et al. (2017) document a Big *N* effect. Local auditors constitute the contrast to the *Big 4* auditors. This adds another international versus national layer of independence.

Lawrence et al. (2011) supply arguments for no difference between Big *N* auditors and others. Both types must adhere to the same regulatory framework, local auditors are likely to have better knowledge of the local market, and there is knowledge transfer as personnel switch from Big *N* to local and vice versa. These arguments could well apply to Norway, where most auditors attend the same university to obtain their certified public auditor qualifications. Personal relationships are accordingly close. However, Francis and Wang (2008) find the Big *N* effect in countries with high investor protection, such as Norway. Overall, the Big *N* effect in Norway is an open question.

The size of the company can be important for the size of abnormal returns. Reynolds and Francis (2000) find that larger firms receive better auditor services than smaller. The auditor is more concerned with greater litigation risk from larger companies. Moeller, Schlingemann, and Stulz (2004) document that larger bidder firms experience negative abnormal returns,

while smaller bidders gain. In line with this evidence, we expect the company size is negatively associated with abnormal returns. We measure this as the equity market value of the company.

The takeover premium can relate to abnormal returns. Former studies, e.g. Louis and Sun (2010), employ this variable. The takeover premium is the difference between the transaction price and the price per share in the market just before the takeover announcement. A higher premium should be associated with higher abnormal returns for both bidder and target.

The form of transaction can matter for abnormal returns. We differentiate between acquisitions and mergers. Since a bid for acquisition often elicits counterbids from other companies, general market theory predicts that abnormal returns are higher for acquisitions than for mergers. Researchers often use auction theory to understand the bidding process in an acquisition. For instance, Bulow, Huang, and Klemperer (1999) analyse how a bidder holding a toehold increases the chances of winning the contest. Their model predicts that the takeover price increases if a rival also has a toehold. Betton and Eckbo (2000) confirm predictions from the model.

We include the risk-free rate of return. The reason is that the transactions in our sample are from different years, spanning the financial crisis and after. We know that the interest level impacts investments and takeovers. Therefore, it is important to control for this variable.

We do not consider the method of payment for our sample of M&As. Although Travlos (1987) demonstrates the value of this variable, we restrict the analysis to the variables mentioned above in the interest of parsimony.

3. Method

We use the *market model* to determine the abnormal return. We assume the market model covers relevant information at time *t*, thus we can write the abnormal return as

$$AR_{it} = R_{it} - R_f - \beta_i(E(R_M) - R_f) \quad (4)$$

where $E(R_M)$ is the expected return on the market portfolio, R_f is the riskfree rate, and β_i is the beta for company *i*. The return is logarithmic, that is, a given return is $R_{it} = ln(P_{it}/P_{it-1})$ where P_{it} is the stock price of stock *i* at time *t*.

We use a modified Eckbo and Langohr (1989) methodology to implement the *CAR* calculation. We run the regression

$$R_t = \alpha_1 + \alpha_2 d_t + \beta_1 R_{mt} + \beta_2 R_{mt} d_t + \sum_n^N \delta_n F_n + \varepsilon_t \quad (5)$$

where d_t is a binary variable being 1 if it is in the event window, d_n is a binary variable being 1 if it is day *n* in the event window, and F_n is a binary variable being 1 if it is transaction *n*. We modify Eckbo and Langohr by including binary variables for transactions *F*, while Eckbo and Langohr have binary variables for days in the event window. We have a total of 200 transactions in the sample. The effect of these variables is to adjust the general result for the whole sample in the first terms of (5). Running this regression, leaving out the first transaction in order to avoid the "dummy trap", for the whole period and then calculating the expected return gives us the opportunity to form the abnormal returns *AR* in the event window. These will be the average *AR*. By cumulating we arrive directly at the *CAR* in the analyses. Averaging the *CAR* gives the *CAAR*.

3.1 The relationship between *CAR, shared auditor* and other variables

An obvious advantage of the event methodology is that it allows the researcher to find firm characteristics to explain differences in abnormal returns without worrying about endogeneity

issues. Firm characteristics are measured as annual observations in our study, and these are clearly antecedent to the abnormal returns. Furthermore, by contrasting results in bidder and target, we have close to an experimental situation, with the companies with a shared auditor as "treated" and those without as "untreated".

We perform multivariate regressions of the relationship between *CAR*, *Shared auditor* and other variables. We use all *CAR* records for the entire event window period (-20,20), that is, from 20 days before announcement day and 20 days after, and then for sub-periods. In this way we study the main relationship more closely.

Specifically, we estimate the following relationship.

$$CAR = \beta_1 Shared + \beta_2 ShareBid + \beta_3 Tenure + \beta_4 Big4 + \beta_5 ShCity + \beta_6 ShInd + \beta_7 ln(MV) + \beta_8 Premium + \beta_9 Bidder + \beta_{10} Acqui + \beta_{11} R_f + Constant \qquad (6)$$

Table 1 about here

Table 1 gives definitions of variables. We drop time subscripts in the expression (6) in the interest of economy. We run regressions for various definitions of *CAR*. In the first regression, we use all *CAR* values as dependent variables, in later regressions we successively limit the sample by excluding days from day 1 to 20, then from -5 to 20, and so on. In this way we execute regressions in ever increasing distance before the announcement date. Lastly, we perform regressions on the short window (-1,1) that is commonly used in event studies. Then we run the same regressions on bidder and target sub-samples, excluding the *Shared*Bidder* and *Bidder* variables from (6). We perform regressions with heteroskedasticity-robust standard errors (Wooldridge, 2010, chapter 4).

4. Data and descriptive statistics

4.1 Data collection and representativeness

We collect data on all completed mergers and acquisitions in Norway in the 2005-2017 period from the Thompson Reuters database. To be included in the sample, three requirements must be met. The first is that at least one of the firms in the transaction needs to be listed on the Oslo Stock Exchange in the period. Furthermore, we require records of at least 140 trading days before the event date. A third requirement is that the bidder obtains at least 50% of the total stock. These requirements give a sample of 202 firms involved in either an acquisition or a merger. We classify 152 firms as bidders and 50 as targets. A shared auditor appears in 50 of the total 202 transactions. The unequal sizes of bidders and targets is not uncommon in takeover and merger studies. For instance, in Martynova and Renneboog (2011) 72.0% of domestic mergers and takeovers are of bidder firms. Table 1 contains definitions of the variables we use.

Table 1 about here

We defined the dependent variables *CAR* and *CAAR* above. We form the *CAR* and the *CAAR* from stock price data from Oslo Stock Exchange. The database is Titlon Financial data for Academic Institutions. The prices are adjusted for dividends, stock splits and other corporate actions affecting the stock price.

Dhaliwal et al. show that the *Bidder* has the most to gain from the *Shared auditor*. In order to capture this effect, we interact the *Shared auditor* and the *Bidder* variables to form the new variable *Shared*Bidder*.

We list data sources on the right-hand side variables in (6) thought to influence the level of abnormal returns and supply further definitions. We hand collect information on the identity of each company's auditor at the time of transaction from its Annual Report giving us information on whether the auditor is shared or not, and if the auditor belongs to the *Big 4*

auditors. The information on the auditor's tenure is hand collected from data on auditor changes from the Company Register at Brønnøysund Register Centre. Here we also extract information on the company's headquarter location by hand. Changes in company name and of auditor exacerbate this time-consuming process.

Titlon also gives us access to the market value of companies. The *risk-free rate* (R_f) is taken to be the rate of Norwegian state 10-year bonds. We obtain the rate from home pages at Norges Bank, the central Bank of Norway.

The *Premium* is defined as the transaction price on the market value minus 1. The information on the transaction value stems from Thompson Reuters. The market value comes from the database Titlon. We take the market value 20 days before the announcement date.

From Titlon we also derive market values of target and bidder. We define the *market value* of the target's equity as the market value 20 days before the announcement date. Data on *Acquisition* is from the Thompson Reuter database.

How representative are the data? Netter, Stegemoller, and Wintoki, (2011) raise questions of representativeness of M&A samples in former research. They note that researchers limit the sample to companies that are listed and large, and then limit the studies to a short sample period. For instance, the consideration of a limited time period can lead researchers to concentrate on transactions that are in or out of a socalled merger wave. We aim to establish a sample as representative as possible. Consequently, we do not exclude firms because they have unwanted characteristics. We discuss concerns over firm and transaction characteristics, merger waves and political uncertainty. Thus, we include both listed and private firms, with the limitation that at least one company must be listed. The sample contains both small and large companies, and small and large transactions. Transaction size runs from USD 1 to 29,960 million. Furthermore, our data runs from 2005 to 2017 and thus contains periods of

both high and low transaction volumes. The period also covers years with strong growth, the financial crisis of 2008, and the crisis in the Norwegian economy following the large drop in petroleum prices after 2014.

Does bias arise because firm and transaction characteristics differ systematically between firms with shared and different auditors? Table 2 gives an overview of stylised facts of the sample.

Table 2 about here

The table also shows that company characteristics are not statistically significant in most cases, the *Big 4* and the *Risk-free rate* are excepted. *Big* is far more common in the *Shared* subsample than in the *Different*. This means that our regressions do not suffer from sample selection bias.

Now look at time repreesentativeness. Betton et al. (2008) define a merger wave as a clustering in time of successful takeover bids at the industry- and economy-wide level. Merger waves are not uncommon. Related to the incidence of merger waves is the frequency of a shared auditor in M&A transactions. Figure 1 exhibits mergers and takeovers in our 2005-2017 sample distributed between those with shared auditor and those with different auditor.

Figure 1 about here

The figure shows that the total number of transactions starts at a high level, then falls off at the financial crisis of 2008, and then regains a higher level. The average number of transactions is 15.4 (standard deviation of 6.2) with a maximum of 27 transactions in 2006 and 2007, and a minimum of 8 in 2013. The number of transactions with shared and different auditor follows the overall pattern. We do not find an unequal time pattern for shared and different auditor. A simple Pearson Chi(sqrd) shows non-significant time distributions of

these variables. It seems that the troughs and crests in merger waves are not sufficient to invalidate our study. In any case, we include transactions from the whole wave cycle. In regressions we include year indicators to control for year effects.

In addition to the Netter et al. (2011) list, Bonaime, Gulen, and Ion (2018) argue that political uncertainty may create bias in the sample. Political uncertainty might be due to changes in laws or in the political interference with the practice of law. However, this does apply to Norway. In 2017, the World Bank ranked Norway as 16th most stable country politically out of 195 ranked nations. In contrast, USA was ranked as number 75, the UK as number 80. In the M&A area the laws were unchanged during the sample period, despite changes in government.

We conclude that the sample is satisfactorially unbiased.

4.2 Description of data

We first run the regression in equation (5) in order to establish the parameters in the relation and to calculate abnormal returns. We drop the first transaction binary variable. The estimated parameters are

$$\alpha_1 = 0.000;\ \alpha_2 = 0.001;\ \beta_1 = 0.562^{***};\ \beta_2 = -0.020.\ R^2 = 0.015; N = 32{,}316.$$

We do not report all company specific parameters. Unreported regressions in sub-samples of *Shared auditor* and of *Bidder* do not give qualitatively different results.

The *event date* is the official announcement day. The days (-20,20) constitute the maximum *event window* where we calculate abnormal return. The event date has number zero. For each transaction we include returns from date -140, thus, we utilise 120 days to fix parameters in the market model.

We now examine some descriptive statistics of the sample. First, we examine the *CAAR* at specific dates ahead of the announcement date, see Table 3. We calculate *CAAR* for the days (-1,1), that is, the first day before and after the event date 0. Likewise, we calculate *CAAR* for the dates earlier in the event window. We use equally weighted abnormal returns.

Table 3 about here

The table first gives the summary statistics for all companies and for subsamples of *Shared*. The sample is then split between bidder and target companies, and then between shared and different auditor sub-subsamples. When we partition the total sample between different and shared auditor, we find that *CAAR* is generally higher in the shared auditor subsample. The contrast is even stronger in the bidder and target subsamples. Here it turns out that the higher *CAAR* values in shared companies are concentrated among the bidders. These findings give motivation for exploring further the relationship between abnormal returns and the shared auditor.

In figure 2 we present the *CAAR* for shared and different auditor companies in target and bidder subgroups for the entire event window.

Figure 2 about here

The two figures are strikingly different. In the target subgroup shared and different auditor companies' *CAARs* are almost indistinguishable, while in the bidder subsample the *CAAR* in the shared auditor companies is clearly well above the *CAAR* in different auditor companies. This confirms the findings in table 3 and in Dhaliwal et al. (2016) that most of the contrast in *CAAR* between shared and different auditor companies is located in the bidder companies. Figure 2 also clearly demonstrates that gains in *CAAR* in shared auditor companies in the bidder subgroup happen before the announcement date, although the runup is rather weak compared to e.g. Jarrell and Poulsen (1989). The *CAAR* is about 2% the day before the event,

compared to 11% in the Jarrell and Poulsen study. The positive runup in *Shared auditor* firms before the event day also indicates that some information leakage happens before the official announcement. This is compelling evidence a shared auditor is important for abnormal returns.

Are the variables we choose for analysis relevant? In table 4 we relate the *CAR* in the entire event window to right-hand side variables in equation (6). Notice when we study the *CAR* in the entire event window, we obtain a total of 8,282 observations (202 companies x 41 days).

Table 4 about here

Table 4 reveals that most of the variables are significantly related to *CAR*. In many cases, the sign in the subgroups are different. In particular, the sign is negative for the different auditor and positive for the shared auditor variable. In summary, the variables are good candidates for inclusion in regression analyses.

The central part of our argument is to uncover if bidder and target experience different abnormal returns at and prior to announcement using the interaction variable *Shared*Bidder*. This creates a multicollinearity problem since 72.0% of the cases when both *Shared* and *Shared*Bidder* are 1, and 100% of the cases when both are 0. Correlations between other right-hand side variables are well below the 70% level that Kennedy (2008) judges critical.

5. Econometric evidence

In this section we report the results from regressions of various specifications of (6). We estimate at the announcement date, but also in the event window prior to the announcement. First, we report results from the full sample. Due to the multicollinearity problem between *Shared* and *Shared*Bidder*, we drop *Shared* in these regressions from (6). Second, dropping the *Shared* variable in the overall regressions motivates a split in the sample between bidder

and target companies, where we drop *Shared*Bidder* and *Bidder* from regressions, but introduce the *Shared* variable. If our hypotheses hold, the results from the two analyses should overlap. Finally, we use lagged *CAR* of various lengths in regressions with the announcement date *CAR* as dependent in order to further explore if valuable information escapes prior to the announcement.

5.1 Results from the full sample

The results of regressions for the first step with the full sample are in table 5 below.

Table 5 about here

The table demonstrates the importance of a *Shared auditor* for the *Bidder*. The *Shared* Bidder* variable is positive and strongly significant in all regressions controlling for other variables in the model. Thus, the *Bidder* gains from having a *Shared auditor*. Having the same auditor in both the *Bidder* and the *Target* companies enhances the *CAR* throughout the event window. The result confirms our expectations in H1 and H2. We replicate the Dhaliwal et al. (2016) result when employing the same event window (-1,1). A remarkable result is that the abnormal returns for the bidder with a shared auditor are consistently high in the runup to the announcement date. The economic significance of the result is considerable. To be a *Bidder* and to have *Shared auditor* with the target company means a higher *CAR* in the area 0.040 to 0.050 compared to not having a *Shared auditor* in the different specifications of the event window. The advantages of having a shared auditor accrue to bidder shareholders both at the announcement date and in the period prior to announcement.

Furthermore, the *Bidder* indicator variable is significantly negative in all five regressions, and the coefficients are always higher than the *Shared*Bidder* variable. Takeover studies regularly yield the negative *Bidder* result. The overall effect in this study confirms this, but

also adds that having a shared auditor mitigates the negative effect of being a bidder even before the announcement. This is also evident in Figure 1B.

The evidence in Table 5 underlines the insights from Dhaliwal et al. (2016) and Cai et al. (2016) that to reduce asymmetric information brings gains to the bidder. We add to this that positive abnormal returns accrue to bidder shareholders in the runup to the announcement date. A shared auditor helps the bidder to overcome the winner's curse, managerial hubris (Roll, 1986) or self-serving (Morck et al., 1990). The evidence is also in line with studies that explore the importance of a relationship between bidder and target matter for valuation. The relationship include shared advisors (Golubov et al., 2012; Agrawal et al., 2013), shared institutional investors (Brooks et al., 2018), shared directors (Cai and Sevilir, 2012; Rousseau and Stroup, 2015; and Stuart and Yim, 2010), and social ties (Ishii and Xuan, 2014). A relationship seems to yield better informed parties, thereby avoiding overpaying.

In contrast to the *Shared auditor* variable, other information variables, *Auditor tenure*, *Shared city* and *Shared industry* are less important and have unstable coefficients. *Auditor tenure* is positive and significant in three window specifications, but the economic significance is small at about 0.2%. *Shared industry* even changes sign over the runup. This means that we cannot confirm the finding in Morck et al. (1990) of a significant relationship between *Shared industry* and abnormal returns. Among the information variables in this study the *Shared auditor* stands out as the most important.

Including control variables do not upset the results for *Shared auditor.* Being a *Big 4* auditor means that the *CAR* is negative and significant for almost all period specifications. The effect is also economically meaningful, in the area of 3.0%. These results are in line with DeFond et al. (2017) and most former research, implying the greater independence of the *Big 4* auditor. The Lawrence et al. (2011) result says that company size is related to abnormal returns and *Big 4* is not. Our size variable *Market value* in Table 5 is significant only in the longest event

window and then negative, and the sign shifts over different window specifications. Both the *Big 4* and the *Market value* results mean that we cannot support Lawrence et al. (2011). The negative *Market value* supports Moeller et al. (2004) among others.

An *Acquisition* transaction as opposed to a *Merger* is significantly positive at around 1.5-2.0%. The result is in line with predictions in Bulow and Klemperer (1996). The takeover premium in acquisitions are higher than in merger. Controlling for this and other commonly applied variables do not upset the results that to have shared auditor in a takeover is beneficial for bidder shareholders.

5.2 Results from the split sample

We now perform analyses of *CAR* and the explanatory variables in sub-groups of *Bidder* and *Target* to investigate the relationship between *Shared auditor* and abnormal returns for *Bidder* companies in particular. In this setup the *Bidder* and *Shared*Bidder* variables fall out. Estimation in sub-groups has the advantage of revealing if the effect of a shared auditor applies in both *Bidder* and *Target*. The results are set out in table 6 below.

Table 6 about here

The table is split in two panels, where Panel A contains estimations in the *Bidder* sub-group and Panel B the *Target* sub-group. Panel A clearly shows that *Shared Auditor* is positive and significant in all specifications but the shortest, confirming the results in Table 5. The coefficients for *Shared Auditor* are of the same magnitude in different regressions. We interpret this finding that most of the abnormal returns are in the runup, suggesting information leakage before the announcement date. In contrast, Panel B shows that *Shared Auditor* is far less consistent; first positive and significant and then negative. The association between *Shared Auditor* and abnormal returns is not as strong for the *Target* companies as for

the *Bidder*. In summary, Table 6 confirms our expectations in H1 and H2. The *Shared auditor* is significantly related to abnormal returns for *Bidder* companies and much of the positive abnormal returns are in the pre-announcement period. The results for the target companies are not as clear-cut.

5.3 *CAR* and the runup

We study if the relationship between the runup and *CAR* is positive using the *CAR* at the event date as the dependent variable. We look at the runup as the lagged *CAR* 15, 10, and 5 days before the event date, and add each lagged *CAR* successively into our original estimation model. Results appear in Table 7.

Table 7 about here

The table indicates that all runup definitions are significant and positive. This means that a former runup relates to a further increase on the event day, as in Jarrell and Poulsen (1989). Besides these, only the *Premium* and the *Bidder* are significant in the regressions. One explanation for lack of significance is that the number of observations is lower than in Table 5. Another explanation can be that the important variables in Table 5, namely *Shared auditor*, *Bidder*, and *Shared*Bidder*, correlate with the lagged *CAR*. We note as well the relatively high and increasing R(squared) in the regressions. This indicates that the information content in the runup variables and others are becoming increasingly exact as we approach the event day.

The regressions in Table 7 cannot determine if information leakage is the case in *Shared auditor* transactions. We agree with Eckbo (2009) that we need more information on the bidding process to determine the question. But the regressions in Tables 5, 6 and 7 could signal an estimation problem. It appears that the researcher must choose to either study

relationships of the *CAR* with plausible variables as in Table 5, or to study the impact of the runup for the final *CAR*.

6. Conclusion

This paper investigates if an acquiring company (a *Bidder*) and an acquired company (a *Target*) gain from having the same auditor. Earlier studies on US data in Dhaliwal et al. (2016) and Cai et al. (2016) find that abnormal returns are higher in companies with shared auditor compared to companies with different auditors, especially for the *Bidder*. The authors put this down to the lowering of asymmetric information between the parties because the shared auditor acts as an information intermediary. We build upon these findings in our study of Norwegian data and confirm results found earlier. In addition, we study if information leakage is large, that is, if abnormal returns are affected prior to the announcement date of the takeover.

We study this in a sample of 202 acquisitions and mergers in Norway in the period from 2005 to 2017. The sample contains stock return records of 50 *Shared auditor* and 152 *Different* in 152 *Bidder* and 50 *Target* companies. We use the event study method in MacKinley (1997) and Eckbo and Langohr (1989) to study effects on abnormal returns around the announcement day and then relate the abnormal returns to *Shared auditor* and other variables studied in the literature.

We find that the *Bidder* gains substantially in terms of higher abnormal returns from having a shared auditor with the target compared to the situation with a separate auditor. The *Target* has inconsistent results, sometimes positive and sometimes negative when the two parties in the takeover have the same auditor. Furthermore, the abnormal gains start well in advance of the announcement of the takeover. In regressions it turns out that the cumulative abnormal

gains are related to the interaction variable *Shared*Bidder*, when other variables are considered. Specifically, we do not find that other information related variables, such as the auditors residing in the same city or belong to the same industry, have any significant relationship with the cumulative abnormal returns. This confirms findings in Dhaliwal et al. (2016) and Cai et al. (2016) and extend results to a substantially smaller equity market and to substantially longer event windows. Lastly, we find that a runup in abnormal returns prior to the announcement day is strongly related to the abnormal return on the announcement day.

Mulherin et al. (2017) encourage more studies of takeover using corporate governance explanations. We offer some insights into the importance of a shared auditor in this paper. Naturally, this aspect is only partial. We leave it to future research to investigate how a shared auditor compares with e.g. overlapping directorships in explaining abnormal returns on the announcement date or before.

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Figures

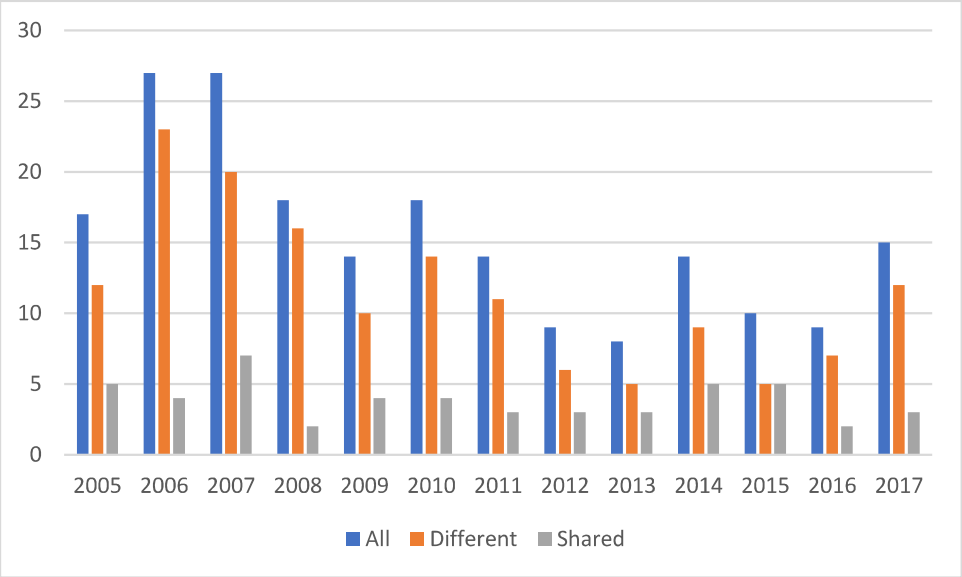

Figure 1 - All transactions per year distributed on *Shared* and *Different auditor*

Figure 2: *CAAR* in event window for *Shared* and *Different auditor* for Target and Bidder companies.

Tables

Table 1: Definitions of variables

Variable	Definition
Shared auditor	A binary variable being 1 if target and bidder have the same auditor, zero otherwise
*Shared*Bidder*	A binary variable being 1 if target and bidder have the same auditor and the company is a bidder, zero otherwise
Auditor tenure	The number of years the auditor has been with the company
Big 4	A binary variable being 1 if the auditors in both companies are either PWC, EY, Deloitte, or KPMG, and zero otherwise
Shared city	A binary variable being 1 if target and bidder have the same headquarter domicile, zero otherwise
Shared industry	A binary variable being 1 if target and bidder belong to the same industry, zero otherwise
Market value	The company's market value at the announcement date
Premium	The price paid for target shares relative to market price on announcement day
Bidder	A binary variable being 1 if the company is a bidder, zero if target
Acquisition	A binary variable being 1 if the transaction is an acquisition, zero if merger
Risk free rate	The rate of interest on 10-year government bonds

Table 2: Firm and transaction characteristics of firms in the sample

Variable	Average	Stdev	Min	Median	Max	N	t-test
Different auditor							
Auditor tenure	4.474	2.480	0.750	3.875	14.500	152	
Big 4	0.487	0.501	0.000	0.000	1.000	152	
Shared city	0.382	0.487	0.000	0.000	1.000	152	
Shared industry	0.467	0.501	0.000	0.000	1.000	152	
ln*(Market value)*	21.085	1.858	16.217	21.133	26.621	152	
Premium	0.846	4.014	0.000	0.125	43.110	150	
Bidder	0.763	0.427	0.000	1.000	1.000	152	
Acquisition	0.480	0.501	0.000	0.000	1.000	152	
Risk free rate	0.064	0.214	0.010	0.037	1.595	152	
Shared auditor							
Auditor tenure	4.595	2.911	1.000	4.000	12.000	50	0.265
Big 4	0.940	0.240	0.000	1.000	1.000	50	8.555***
Shared city	0.440	0.501	0.000	0.000	1.000	50	0.720
Shared industry	0.360	0.485	0.000	0.000	1.000	50	-1.344
ln*(Market value)*	21.417	2.275	16.385	21.433	26.327	50	0.936
Premium	0.726	2.058	0.000	0.163	14.186	50	-0.275
Bidder	0.720	0.454	0.000	1.000	1.000	50	-0.592
Acquisition	0.460	0.503	0.000	0.000	1.000	50	-0.247
Risk free rate	0.031	0.011	0.010	0.034	0.051	50	-1.858*
Total							
Shared	0.248	0.433	0.000	0.000	1.000	202	
Auditor tenure	4.504	2.586	0.750	4.000	14.500	202	
Big 4	0.599	0.491	0.000	1.000	1.000	202	
Shared city	0.396	0.490	0.000	0.000	1.000	202	
Shared industry	0.441	0.498	0.000	0.000	1.000	202	
ln*(Market value)*	21.167	1.969	16.217	21.219	26.621	202	
Premium	0.816	3.621	0.000	0.134	43.110	200	
Bidder	0.752	0.433	0.000	1.000	1.000	202	
Acquisition	0.475	0.501	0.000	0.000	1.000	202	
Risk free rate	0.056	0.186	0.010	0.037	1.595	202	

The t-test is a test if the average of each variable differs in the *Shared* and *Different* auditor subsamples. Significance levels are indicated by * (10%), ** (5%), and *** (1%).

Table 3: Summary statistics for our base-case definitions of abnormal returns (*CAAR*) distributed by *Shared auditor* with a *t*-test of their difference.

	Mean	Stdev	Min	Median	Max	N	t-test
Different auditor							
CAAR11	0.011	0.556	-2.899	-0.010	2.130	152	
CAAR51	-0.107	1.126	-7.023	-0.082	4.891	152	
CAAR101	-0.219	1.857	-12.579	-0.174	7.692	152	
CAAR151	-0.315	2.505	-17.427	-0.255	12.583	152	
CAAR201	-0.347	2.962	-19.674	-0.284	17.133	152	
Shared auditor							
CAAR11	0.123	0.391	-0.522	0.040	1.389	50	1.573
CAAR51	0.181	0.936	-1.188	-0.040	3.953	50	1.792*
CAAR101	0.257	1.657	-1.713	-0.083	7.655	50	1.707*
CAAR151	0.276	2.060	-2.443	-0.184	9.243	50	1.663*
CAAR201	0.333	2.263	-3.033	-0.157	9.672	50	1.698*
Total							
CAAR11	0.039	0.521	-2.899	-0.002	2.130	202	
CAAR51	-0.036	1.087	-7.023	-0.066	4.891	202	
CAAR101	-0.101	1.817	-12.579	-0.142	7.692	202	
CAAR151	-0.168	2.411	-17.427	-0.225	12.583	202	
CAAR201	-0.179	2.815	-19.674	-0.250	17.133	202	
		TARGET					
Different auditor							
CAAR11	0.302	0.695	-2.114	0.237	2.1297	36	
CAAR51	0.354	1.417	-3.188	0.173	4.8914	36	
CAAR101	0.517	2.329	-4.438	0.091	7.692	36	
CAAR151	0.614	3.228	-7.037	0.022	12.5829	36	
CAAR201	0.705	4.015	-9.284	-0.003	17.1329	36	
Shared auditor							
CAAR11	0.342	0.336	-0.469	0.325	0.768	14	0.278
CAAR51	0.463	0.788	-0.499	0.280	2.2161	14	0.346
CAAR101	0.554	1.486	-1.368	0.107	3.6912	14	0.067
CAAR151	0.524	1.966	-2.062	-0.106	4.3985	14	-0.119
CAAR201	0.584	2.198	-2.121	-0.153	5.0469	14	-0.136
		BIDDER					
Different auditor							
CAAR11	-0.079	0.473	-2.899	-0.074	2.0455	116	
CAAR51	-0.250	0.983	-7.023	-0.177	2.6187	116	
CAAR101	-0.447	1.630	-12.579	-0.250	4.371	116	
CAAR151	-0.603	2.171	-17.427	-0.354	6.1332	116	
CAAR201	-0.673	2.481	-19.674	-0.400	7.0201	116	
Shared auditor							
CAAR11	0.038	0.382	-0.522	-0.037	1.3887	36	1.517
CAAR51	0.071	0.975	-1.188	-0.070	3.9533	36	1.725*
CAAR101	0.141	1.725	-1.713	-0.180	7.6549	36	1.811*
CAAR151	0.179	2.114	-2.443	-0.208	9.2433	36	1.926*
CAAR201	0.235	2.310	-3.033	-0.182	9.6716	36	2.023**

CAAR11 is the *CAAR* from date -1 to 1, and *CAAR201* from -20 to 1. Significance levels from simple t-test of the difference between *Shared* and *Different* is indicated by * (10%), ** (5%), and *** (1%).

Table 4: *CAR* and firm characteristics. *CAR* average levels and standard errors in firm and transaction characteristic variables

	Indicator value			
	0	1	Total	t-value
Shared auditor	*Different*	*Shared*		
Average	-0.004	0.017	0.002	-4.371***
Std.error	0.003	0.003	0.002	
*Shared*Bidder*	*Different*	*Shared*		
Average	0.001	0.005	0.002	-0.701
Std.error	0.002	0.003	0.002	
Tenure	*< 5 years*	*> 5 years*		
Average	0.008	-0.011	0.002	4.229***
Std.error	0.003	0.003	0.002	
Big 4	*Local*	*Big4*		
Average	0.009	-0.003	0.002	2.911**
Std.error	0.003	0.003	0.002	
Shared city	*Different*	*Shared*		
Average	-0.007	0.015	0.002	-5.387***
Std.error	0.003	0.003	0.002	
Shared industry	*Different*	*Shared*		
Average	0.015	-0.016	0.002	7.567***
Std.error	0.003	0.003	0.002	
Market value	*Lower*	*Higher*		
Average	-0.001	0.004	0.002	-1.342
Std.error	0.003	0.002	0.002	
Premium	*Lower*	*Higher*		
Average	-0.008	0.011	0.002	-4.797***
Std.error	0.003	0.003	0.002	
Acquisition	*Merger*	*Acquisition*		
Average	-0.001	0.004	0.002	-1.120
Std.error	0.003	0.003	0.002	
Bidder	*Target*	*Bidder*		
Average	0.064	-0.019	0.002	17.706***
Std.error	0.005	0.002	0.002	
Risk-free	*Lower*	*Higher*		
Average	-0.001	0.004	0.002	-1.242
Std.error	0.003	0.002	0.002	

Lower/Higher indicates a partition of the continuous variable at the variable's median value. 8,282 observations. Student's *t*-test gives significance level. Significance levels are indicated by * (10%), ** (5%), and *** (1%).

Table 5: Regressions with *CAR* as dependent variable. Adjustments for heteroskedasticity. Full sample

	Event window					
Variable	(-20,20)	(-20,0)	(-20,-5)	(-20,-10)	(-20,-15)	(-1,1)
*Shared*Bidder*	0.041***	0.054***	0.054***	0.048***	0.036***	0.046**
Auditor tenure	0.002***	0.002***	0.002*	0.001	0.000	0.003
Big 4	-0.028***	-0.036***	-0.037***	-0.033***	-0.024**	-0.026
Shared city	0.002	0.006	0.001	-0.004	-0.005	0.012
Shared industry	-0.013***	0.008*	0.006	0.000	-0.004	-0.008
ln*(Market value)*	-0.006***	0.001	0.001	0.001	0.000	-0.006
Premium	-0.009***	-0.006***	-0.006***	-0.008***	-0.008***	-0.012***
Bidder	-0.112***	-0.085***	-0.076***	-0.071***	-0.063***	-0.158***
Acquisition	0.014***	0.024***	0.024***	0.023***	0.016**	0.014
Risk-free rate	0.064***	0.067***	0.063***	0.061***	0.052***	0.064**
Constant	0.002	-0.170***	-0.170***	-0.162***	-0.097	0.060
Rsqrd	0.146	0.140	0.139	0.155	0.159	0.211
F probability value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	8,282	4,242	3,232	2,222	1,212	606

Each regression contains year indicator variables with 2005 excluded. Significance levels from simple t-test of the difference between *Shared* and *Different* is indicated by * (10%), ** (5%), and *** (1%).

Table 6: Regressions with *CAR* as dependent variable in sub-groups. Adjustments for heteroskedasticity.

Panel A: Bidder companies

	Event window					
Variable	(-20,20)	(-20,0)	(-20,-5)	(-20,-10)	(-20,-15)	(-1,1)
Shared auditor	0.022***	0.037***	0.037***	0.032***	0.022***	0.026
Auditor tenure	0.003***	0.002***	0.002**	0.002*	0.001	0.004
Big 4	0.005	-0.014**	-0.018**	-0.016*	-0.008	0.010
Shared city	0.004	0.000	-0.001	0.000	0.003	0.006
Shared industry	-0.010**	0.001	0.000	-0.004	-0.007	-0.008
ln*(Market value)*	-0.011***	-0.002	-0.001	-0.001	-0.003*	-0.011*
Premium	0.007***	0.001	0.000	0.000	-0.001	0.009
Acquisition	0.026***	0.025***	0.019***	0.012**	0.002	0.044***
Risk-free rate	0.038***	0.055***	0.059***	-0.112***	0.057***	0.025
Constant	0.046	-0.175***	-0.185***	-0.180***	-0.119**	0.079
Rsqrd	0.086	0.106	0.106	0.101	0.104	0.113
F probability value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	6,232	3,192	2,432	1,672	912	456

Panel B: Target companies

	Event window					
Variable	(-20,20)	(-20,0)	(-20,-5)	(-20,-10)	(-20,-15)	(-1,1)
Shared auditor	0.040***	0.024*	0.006	-0.005	-0.001	0.099*
Auditor tenure	-0.009***	-0.012***	-0.015***	-0.016***	-0.017**	-0.008
Big 4	-0.126***	-0.110***	-0.106***	-0.102***	-0.097***	-0.118**
Shared city	-0.046***	-0.004	-0.004	-0.015	-0.022	-0.055
Shared industry	-0.013	0.027***	0.018	0.009	0.006	0.030
ln*(Market value)*	0.016***	0.013**	0.018***	0.023***	0.025**	0.011
Premium	-0.006***	-0.010***	-0.009***	-0.008***	-0.008***	-0.012***
Acquisition	0.039***	0.060***	0.087***	0.104***	0.097***	-0.060
Risk-free rate	0.140***	0.099***	0.120***	0.133***	0.120**	0.020
Constant	-0.593***	-0.419**	-0.646***	-0.866***	-0.878**	0.236
Rsqrd	0.308	0.358	0.381	0.408	0.428	0.404
F probability value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	2,050	1,050	800	550	300	150

Each regression contains year indicator variables with 2005 excluded. Significance levels from simple t-test of the difference between *Shared* and *Different* is indicated by * (10%), ** (5%), and *** (1%).

Table 7: The importance of the runup for the cumulative abnormal return at event day 0. Year indicator variables are in the regressions. Regressions are adjusted for heteroskedasticity.

Variable	(1)	(2)	(3)
CAR(-15)	0.709***		
CAR(-10)		0.862***	
CAR(-5)			0.836***
*Shared*Bidder*	0.013	-0.002	-0.002
Auditor tenure	0.005	0.004	0.004
Big 4 auditor	-0.001	0.007	0.003
Shared city	0.029	0.033**	0.014
Shared industry	0.018	0.015	0.001
ln(Market value)	-0.004	-0.004	0.000
Premium	-0.004	-0.005*	-0.008**
Bidder	-0.040	-0.024	-0.013
Acquisition	0.019	0.005	0.004
Risk-free rate	0.016	0.007	-0.026
Constant	0.041	0.052	0.132
Rsqrd	0.477	0.697	0.774
F probability value	0.000	0.000	0.000
Observations	202	202	202

Each regression contains year indicator variables with 2005 excluded. Significance levels from simple t-test of the difference between *Shared* and *Different* is indicated by * (10%), ** (5%), and *** (1%).