The Effect of Credit, Liquidity and Rollover Risk on Bondholder Wealth in Mergers and Acquisitions

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Abstract

We analyze M&A announcements and focus on the potential impact of these deals on bond prices in the US corporate bond market. In particular, we investigate the effect of changes in credit, liquidity and rollover risk. This is important, as especially target firms are often small with rather illiquid bonds and show maturity concentrations. M&A transactions can significantly change the debt maturity structure and liquidity risk of these bonds. We find the size of the average announcement return of target bonds is 40 bp and increases by around 50% for target firms with a low debt dispersion and illiquid bonds. Furthermore, we document a permanent increase of 15% in the liquidity of these bonds. We find only small negative returns for acquirer bonds, which can be explained by the difference in size. Overall, we provide important new insights concerning bond price effects around M&A announcements.

JEL-Classification: G10, G14, G32, G34

Keywords: bond price, acquisition, merger, event study, co-insurance, rollover risk

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1 Introduction

Mergers and acquisitions play an important role in financial markets, as M&A activities allow optimizing firms along multiple dimensions (e.g., market power, cost efficiency or growth). Large deals can reach values of tens of billions of US dollars, which represent major corporate events for all stakeholders in the company. While there exists an extensive literature analyzing M&A success, M&A deal completion probability, and stockholder wealth effects, the literature on effects on bondholders is scarce and often contradictory, especially earlier work that is based on less detailed data.[1]

In this paper, we analyze the price effects of M&A announcements in the US corporate bond market based on transaction data. Our focus is on the potential impact of these deals on the credit risk of the bonds. In particular, we extend the existing literature focusing on credit rating differences, by exploring the impact of changes in liquidity and rollover risk. This is important, as target firms are often small with rather illiquid bonds outstanding and show maturity concentrations. This approach allows us to provide a more detailed analysis of the bond price effects around M&A announcements and to understand changes in the overall risk profile of bonds.

So far, most of the empirical studies on bondholder wealth effects agree that besides deal-related effects anticipated changes in credit risk play an important role for bondholders around M&A announcements.[2] Such deals represent major credit events for the companies involved and, thus, affect bondholders and their credit risk. Particularly, bondholders of target firms experience a massive change in their exposure to credit risk as target firms are usually much smaller than their counterparts and, thus, are much more affected. Empirically bondholders of target firms with low credit ratings compared to acquirers usually experience a positive wealth effect (see Billett et al. (2004) or Chen et al. (2020)). However, focusing only on credit rating differences is not considering important aspects of M&A deals. These

[1] See e.g., Jensen and Ruback (1983), Bruner (2002), Haleblian et al. (2009) for a comprehensive overview.

[2] For example, relative target size (e.g., Fuller et al. (2002)) or deal financing method (e.g., Loughran and Vijh (1997)).

transactions can change the maturity structure of firms and the liquidity risk of their bonds and, thus, significantly affect the default risk by changing the exposure to rollover risk. This important credit risk channel is especially relevant for M&A activities as the refinancing structure changes significantly. This makes M&As a perfect candidate for event studies on the impact of changes in bond risk profiles on bond prices.

In order to investigate the effects of credit, liquidity, and rollover risk on prices of individual bonds subject to M&A activities, we study the announcement return of such bonds. It is important to focus on deal announcements and not deal completions as most of the information concerning the deal is immediately available after its announcement.[3] We use bond transaction data from TRACE covering a period from 2002 to 2018, which additionally allows us to provide bond-specific liquidity characteristics. Replicating the results of the existing literature, we measure anticipated changes in credit risk using the credit difference, i.e., the difference in rating grades when comparing acquirer and target bonds. To measure liquidity risk we employ the price dispersion measure of Jankowitsch et al. (2011) and for rollover risk we use the debt dispersion measure introduced by Choi et al. (2018). Overall, we analyze 2355 bond-deal observations.

In general, we expect effects on target bondholders to be much more pronounced, because of the size differential of target and acquirer firms. The median acquirer firm has around 32 billion USD in total assets whereas the median target firm has nine billion USD in total assets. This size differential is also reflected in the notional and number of bonds outstanding. We find that target bondholders experience a significant positive wealth effect during an announcement event, whereas we observe a loss for bondholders of acquirer firms, on average. This result is in line with previous studies. The effects are much stronger for target firm bondholders compared to acquirer firm bondholders. For example, the size of the average announcement return of target bonds is +40 bp compared to −1.7 bp for acquirer bonds.

[3]This event study setting is standard in the literature (e.g., Billett et al. (2004)).

Analyzing credit risk based on differences in bond ratings, we show that bonds with high credit risk compared to their counterparts, i.e., the respective counterparty bonds have a better rating, have higher announcement returns. For example, target bonds with a positive credit difference have an announcement return of 74 bp versus only 8 bp for bonds with a non-positive credit difference.[4] These results hold also if we condition on investment grade and speculative grade ratings instead of credit difference.

Focusing on liquidity risk, we find that target bonds that have a low pre-announcement liquidity deliver a 57 bp announcement return in contrast to a 18 bp announcement return for liquid target bonds. Thus, we find that announced deals that potentially increase the liquidity of target bonds more, lead to higher bond prices. To analyze this result in more detail, we explore the change in liquidity of the bonds around the announcement dates. The average transaction cost of target bonds, measured by the price dispersion, is 39 bp before the announcement and 33 bp after — this is a decrease in transaction costs, i.e., an increase in liquidity of 15%. For acquirer bonds, this decrease is only marginal, from 28 bp to 27 bp. Thus, target bonds benefit more from the higher liquidity of the acquirer bonds and their liquidity improves. Turning to rollover risk, we find that, bonds of target firms that are relatively more exposed to rollover risk have significant higher announcement returns. Bonds of firms with a relatively low debt dispersion have announcement returns of 56 bp, on average, whereas bonds of firms that have a high debt dispersion yield an announcement return of 24 bp on average. Overall, we find that liquidity and rollover measures have significant economic effects.

We confirm all these results in a regression setup, using various controls and robustness test. In particular, we show in the regression analysis that measures related to liquidity and rollover risk have significant price effects in addition to the results based on the credit difference measure. Furthermore, these regressions also provide results that revisit the findings

[4]Billett et al. (2004) and Chen et al. (2020) report the same outcome. Billett et al. (2004) find that acquirer bonds with a rating above the target firm rating have a higher announcement return, but this result is statistically insignificant as well.

of the existing literature. In particular, we provide results for within versus across industry M&As, different financing mix (cash versus stock) and different sizes. We find significant announcement returns for target bonds if acquisitions are within industry. We show that deals financed without cash lead to a significant positive wealth effect for bondholders of both firms.

In summary, this study analyzes the wealth effects of bondholders in M&A transactions. We focus on the effect of changes in credit, liquidity and rollover risk. To the best of our knowledge, this paper is the first that incorporates all these effects in its empirical design. We show that bondholders of target firms that have a very concentrated maturity structure gain in value, because the acquiring firm usually has a more dispersed debt structure due to its size. Thus, the bonds of target firms become more liquid with less rollover risk in the future. These results provide new insights concerning bond price effects around M&A announcements.

The remainder of the paper is structured as follows: Section 2 reviews the literature and in Section 3 we derive the hypotheses. Section 4 introduces the data sources used. Section 5 gives details on the construction of variables of interest and provides the methodology. Section 6 presents the results and Section 7 concludes.

2 Literature review

The literature on bondholder wealth effects provides a solid theoretical foundation based on different models. The theoretical work discusses two main reasons for M&A transactions that impact bondholder wealth positively. On the one hand, there are synergistic mergers that allow the combined firm to harvest efficiency gains. In such cases, firm value and bondholder wealth increases (see for example Jensen and Ruback (1983)). On the other hand, there are non-synergistic mergers arguing that bondholders can benefit from M&A through the co-insurance effect. Lewellen (1971) was the first one to introduce this idea. He argues that if two firms with imperfectly correlated cash flows merge, then the default risk of the combined firm is less than the sum of default risks of the standalone firms. Along the same lines, Hann et al. (2013) argue that highly diversified firms lower their systematic risk. In their model, highly diversified firms are represented by multiple uncorrelated cash flows that absorb shocks and, thus, not only default risk, but also systematic risk should decreases, as the aggregate default risk in an economy with more diversified firms is lower. Shastri (1990) extends this idea and argues that not only the correlation of cash flows matters, but also the overall risk, maturity structure and financial leverage. For example, target bonds with high risk, high leverage and short maturity should deliver positive returns in M&A transactions. Fu and Tang (2016) even relate corporate debt maturity to firms' acquisition decisions. They find that acquirers with shorter debt maturity are less likely to acquire because of increased liquidity risk. However, if such firms acquire, then the market assumes that such firms realize more efficient M&A deals. Overall, the literature argues that realizing efficiency gains and optimizing the risk profile can lead to positive bondholder wealth effects. Most of the papers implicitly focus on the effects of target bonds.

The empirical evidence is ambiguous, especially earlier studies find mixed results regarding bondholder returns. Maquieira et al. (1998) for example document positive (or at least non-negative for certain bonds) excess returns. On the other hand, Kim and McConnell (1977) find insignificant target excess returns, but an increase in leverage and Dennis and McConnell (1986) also document that target bondholders do not experience any wealth effect during M&A announcements. Several other studies present conflicting evidence in terms of statistical significance.[5]

These early papers either study very coarse data sets of bond prices or they had to estimate model prices, that are often not representative. Later studies with higher quality data sets tend to find more similar effects on bondholder wealth. Billett et al. (2004) find that target firm bondholders significantly gain and acquirer bondholders significantly lose

[5] E.g., Eger (1983), Asquith et al. (1983), Dennis and McConnell (1986), or Billett et al. (2004).

during M&A announcements. Furthermore, they document a co-insurance effect for target bonds showing that bonds that are rated below the acquirer gain more. Kedia and Zhou (2014) also document a similar co-insurance effect. Chen et al. (2020) in essence replicate the results of Billett et al. (2004) with bond price data from TRACE confirming a strong co-insurance effect for target bondholders and a wealth transfer from acquirer bondholders to target bondholders. On the other hand, Penas and Unal (2004) document positive excess returns for bondholders of target and acquirer firms. However, they focus on bank mergers, whereas other authors explicitly exclude financial firms (and utility firms) from their samples. Conflicting evidence is presented, e.g., by Furfine and Rosen (2011) who use Moody's expected default frequency measure in their study and conclude that all mergers increase default risk implying negative bondholder returns. Our paper contributes to the literature by analyzing the impact of default risk in more detail. While the existing literature is focused on differences in credit ratings, we incorporate the effects from liquidity and rollover risk.

3 Hypotheses

Mergers and acquisitions affect the capital structure and risk profiles of the involved parties significantly. Thus, the default and liquidity risk of all outstanding bonds are subject to change, as well. In principle, acquirer and target bonds are both affected. However, with growing size differential between the involved firms, the impact on the acquirer firm's bonds is expected to diminish. In the spirit of Jensen and Ruback (1983), Lewellen (1971) and Shastri (1990), we assume that in M&A activities either synergies arise that improve the risk profile of the new firm or a co-insurance effect can be realized by combining not perfectly correlated cash-flows. In the first case, both target and acquirer bonds improve as their default risk decrease, e.g., by implementing a general cost reduction. In the second, case at least one company benefits. In most cases, this is the target firm, as it is often much smaller and riskier. Also, the acquirer firm can benefit, if the diversification effect is large enough.

However, given the size difference this effect might be small.

Hypothesis 1: We assume to find a positive bond price impact in M&A transactions due to synergies and co-insurance effects. This impact is on average stronger for target bonds, as they benefit more given the riskier profile, on average.

We analyze whether these positive effects are more significant, in cases where the ex-ante differences in the perceived risk of the firms is larger. Following the existing literature, we measure these differences in risk using the credit rating of the involved bonds, in the first step.

Hypothesis 2: We assume that the difference in credit rating between acquirer and target bonds has a significant effect. We expect significantly greater, positive effects in case that target bonds have a lower rating compared to their counterparts of the acquirer firm. Vice versa, we expect a more positive effect, if a firm acquires a company with better rating quality.

However, considering only credit rating differences is a crude proxy for the overall change in the risk profile of the bonds. First of all, the liquidity risk of the bonds might change as well. If illiquid target bonds are integrated in the capital structure of a large corporation, the investor base and the trading activity in these bonds might be very different, leading potentially to additional price effects. Second, M&A deals impact the whole capital structure of the involved firms and, especially, changes the maturity structure of its debt. Thus, the exposure to rollover risk can change and affect the overall default risk. We consider rollover risk in the spirit of He and Xiong (2012) and He and Milbradt (2014), who model the risk that the refinancing of a maturing bond might only be possible at a higher credit spread, in case a liquidity shock hits the market at the time of the refinancing. Nagler (2019) shows this effect this empirically. Thus, companies with a more concentrated debt structure are more prone to these shocks and, thus, their bonds incorporate a significant rollover risk premia. Since the debt structure in an M&A transaction is changing, the exposure to rollover risk can also change significantly. For example, if two firms with concentrated maturity structure merge, the new debt structure might be more diversified with less rollover risk.

Hypothesis 3: We expect that that the differences in liquidity and rollover risk between acquirer and target bonds have significant effects. We expect significantly greater, positive effects in cases where target bonds are less liquid or have a less dispersed maturity structure compared to their counterparts of the acquirer firm and vice versa.

In our empirical exercise, we employ the price dispersion measure of Jankowitsch et al. (2011) to measure transaction costs and the measure of debt dispersion introduced by Choi et al. (2018) to measure the concentration of debt maturities. These two measures allow us to analyze the bond price reactions to M&A transactions in more detail by considering different aspects of how the risk profile of bonds can change. Overall, we analyze whether changes in credit, liquidity and rollover risk significantly affect the M&A outcome for bondholders. This allows us to foster our understanding of bond price reactions due to changes of the various risk factors, in general.

4 Data

We employ all merger and acquisition events where target and acquirer are located in the US and where both firms have outstanding bonds. We focus on transactions where the (estimated) deal value exceeds one billion US dollar from Bureau van Dijk's Zephyr database, covering more than 90% of the overall observed deal volume. This is similar to other studies that condition on listed firms or significant deals. We use deals in the time window mid 2002 to September 2018, as in 2002 the TRACE transaction database was introduced, covering virtually all bond trades since then. In this time window, we observe a sample of 1731 deal announcements. Note all these deals are acquisitions. We find only six mergers with a deal value that exceeds one billion US dollar, which are all announced before the start of our sample.

We match the M&A deals with bond-level information from the Mergent Fixed Income Securities Database. We follow the relevant literature on corporate bonds and consider senior, unsecured corporate bonds denoted in US dollar with fixed coupon that are straight excluding all others with complex structures, such as asset-backed and convertible securities. We add the bonds' ratings from the Mergent database at the time of announcement to these pairs. A rating has to be available at least one day before a deal announcement.[6] This leaves us with 945 deals and 4151 unique bonds.

For all bonds in the sample, we use transaction data from TRACE and clean its price information with the standard algorithms (see Dick-Nielsen (2009, 2014)). We exclude non-institutional trades, trades on weekends, and trades flagged as special trade and apply a median and a bond price reversal filter. To aggregate prices at a daily level, all transaction prices on a day are volume weighted. As the US corporate bond market is quite illiquid, this leaves us with a total of 502 deals where we observe 2381 bond-deal pairs. If we drop bonds in default, we have 2355 bond-deal pairs for which we can compute announcement returns, 1911 acquirer and 444 target bond-deal observations. In order to compute the abnormal return of a bond we need at least one price before and one price after the announcement in a ± 5 day window.

In addition, firm level data is added from Compustat. Furthermore, in order to compute abnormal returns, we construct benchmark portfolios for each rating grade. To construct the benchmark portfolios we use all bonds that have a certain rating in the Mergent database and price observations in the cleaned TRACE database at the time of deal announcements.

[6] If there are multiple ratings from different rating agencies, we compute a bond's rating as the ceiling of the median of all available ratings, where one corresponds to the best rating category.

5 Methodology

We present here the methodology for the calculation of the announcement returns. In addition, the estimation procedure for the credit difference, price dispersion and maturity dispersion variables are explained. These variables represent our measures for differences in credit, liquidity and rollover risk. Furthermore, we present the regression setup for our analysis of the announcement returns.

When conducting a bond event study several distinct features of the bond market have to be taken into account. Since bonds trade significantly less frequently than stocks, the event window, i.e., the days before and after the announcement event, is regularly chosen to be wider compared to stock event studies. As is common in the literature, we use a ± 5 days window. In addition, it has to be considered that not all bonds actually trade on all days in the event window. Some studies solve this problem by focusing on the nearest trade before and after the event or by simply averaging all prices before and after the event in the considered time window. The first approach often leads to quite noisy return estimates and the second approach has the disadvantage that returns are based on varying multiday periods.

To account for these issues, we use an abnormal returns calculation based on Ederington et al. (2015). In the first step, we calculate for each bond in the considered time window volume-weighted average daily prices. Based on these daily prices, we calculate event returns for all possible combination of a particular day before and after the event, i.e.:

$$R_{t-i,t+j} = \frac{p_{t+j}}{p_{t-i}} - 1 \qquad \text{for } i, j \in [1, 5], \tag{1}$$

where p_t is the volume weighted daily bond price and $t = 0$ is the day of the M&A announcement. In case, a bond is traded on all five days before and after the event, this yields 25 return observations. For the least liquid bonds, we only observe prices on one day before and after the event, not necessarily with equal time distance to the event. Thus, here we have only one return estimate available. In the last step of the procedure, we will adjust the returns for the time differences.

Before this final step, we adjust the returns for price movements in the underlying bond market, i.e., we calculate abnormal returns. Note that the bonds in our sample have different ratings, i.e., a different exposure to credit risk. To account for this difference, we calculate rating-specific market returns. Thus, we construct portfolios for all ratings grades. Note that we focus on main rating grades and drop rating notches, otherwise the resulting portfolio returns would be quite noisy given the general illiquidity of the market. For the same reason, we combine AAA and AA bonds and bonds rated B and below into a portfolio. Thus, we end up with five different benchmark portfolios. Note that in most other studies only investment and speculative grade benchmark portfolios are applied. Thus, our approach considers credit risk in more detail.

Similar to Bessembinder et al. (2008) we do not further partition the portfolios into different maturity or liquidity categories, as we would otherwise run into data availability issues when constructing these benchmark portfolios.[7] We compute the returns of these market portfolios in the same manner as the bond returns and subtract them from the corresponding bond returns to receive abnormal returns. We then convert all abnormal returns to daily returns based on compounded interest rates and average them to obtain the abnormal announcement return of a bond.

In our paper, we use three different variables to account for credit, liquidity and rollover risk. To measure how a particular bond in an M&A deal is impacted by differences in credit risk between acquirer and target, we follow earlier studies (e.g., Billett et al. (2004) or Chen et al. (2020)) and use the difference in the bonds' ratings — we call this the credit difference. Note that the bonds of one firm can have different ratings. To estimate the credit difference of a particular bond, we compare its rating with all the bond ratings of the other involved

[7] On average the highest rated portfolio, AAA and AA bonds, consists of 1090 bonds, the A benchmark of 3700 bonds, the BBB portfolio of 2138 bonds, the BB portfolio of 870 bonds, and the lowest rated benchmark portfolio, B and below, of 935 bonds.

company. To aggregate these ratings of the other firm, we use the median of the ratings. If necessary, we round the median to the next full rating grade. The difference between the rating of the considered bond and this aggregate rating represents the credit difference. Note that a positive credit difference means that the bond at hand has a lower rating compared to the bonds of the other firm in the M&A deal. For the purpose of calculating the credit difference, we use all 22 available rating grades.

To measure bond market liquidity, we use the price dispersion introduced by Jankowitsch et al. (2011). We compute the price dispersion on a weekly basis. This is necessary as at least two trades are needed in the estimation procedure and otherwise the liquidity measure can not be calculated for many bonds. The price dispersion of a bond in a given week t is given by

$$\text{Price Dispersion}_t = \sqrt{\frac{\sum_{i \in I} v_i (p_i - \bar{p})^2}{\sum_{i \in I} v_i}}, \tag{2}$$

where I is the set of all trades in a bond in week t. p_i and v_i are the traded price and volume and $\bar{p}$ is the weekly volume weighted price. Note that we calculate the price dispersion measure for $\pm$ 40 weeks time window around the event, to analyze long term effects on liquidity. However, for our main analysis we use the average price dispersion of the five days before the event.

To measure the concentration (or equivalently the dispersion) in firm debt maturities we use the measure of maturity dispersion introduced by Choi et al. (2018). The idea of this measure is to capture a firm's distance from its perfectly dispersed maturity profile. A firm with a perfectly dispersed maturity profile has a constant fraction of debt $1/T$ maturing in each maturity bucket, where T is the observed maximum debt maturity of that firm. The squared distance from such a profile is then defined as:

$$\text{DIST} = \frac{1}{T} \sum_{i=1}^{T} \left(w_i - \frac{1}{T} \right)^2. \tag{3}$$

$w_i = x_i / \sum_i x_i$, where x_i denotes the firm's debt maturing in maturity bucket i and thus w_i is the fraction of the firm's debt maturing in maturity bucket i. By taking the negative log of this distance one can measure dispersion, i.e., Maturity Dispersion $:= -\log(\text{DIST}+0.001)$. Note that we add 0.001 to the squared distance to force the measure to be real as in Choi et al. (2018). This measure is different to approaches that use fixed maturity buckets (e.g., the inverse Herfindahl index of debt maturities) as it is independent of the firm's maturity decision. To minimize the impact of outliers we winsorize all variable at the 1%-level using the whole sample.

For the analysis of the abnormal announcement returns, we use regression models based on stacked bond-deal observations. We run separate regressions for target and acquirer bonds. We use the following regression setup:

$$\begin{aligned} \text{AR}_{i,d} =& \alpha + \text{CDD}_{i,d} + \text{Price Dispersion}_{i,d} + \text{Maturity Dispersion}_{i,d} + \\ & X_{\text{Firm},i,d} + X_{\text{Bond},i,d} + X_{\text{Deal},i,d} + \epsilon_{i,d}, \end{aligned} \tag{4}$$

where $\text{AR}_{i,d}$ denotes the abnormal return of bond i at the deal announcement d, $\text{CDD}_{i,d}$ a dummy whether bond i has a positive credit difference or not with the counterparty of the deal announcement d. Price $\text{Dispersion}_{i,d}$ is the price dispersion of bond i of the week before the deal announcement d and Maturity $\text{Dispersion}_{i,d}$ is its measure of maturity dispersion. $X_{\text{Firm},i,d}$, $X_{\text{Bond},i,d}$, $X_{\text{Deal},i,d}$ denote firm, bond, and deal control variables for bond i in deal announcement d, respectively. On the firm level, we consider firm size, leverage and profit margin. The bond-specific controls are represented by issue size, age and time-to-maturity (TTM). The deal-specific variables are target size and dummy variables for deals within an industry and cash payments. We report heteroskedasticity robust standard errors in all regressions.

6 Results

6.1 Descriptive statistics

In this section, we provide descriptive statistics on the firm and bond level for acquirer and target companies. Table 1 summarizes important characteristics for acquirers in Panel A and targets in Panel B. We find that the median of total assets of acquirer firms is on average nearly four times larger than of target firms: 32 vs 9 billion USD. This is also reflected by the average number of outstanding bonds (5 vs 3 bonds) and the issue size of these bonds, which is 400 million USD smaller for target firms, on average. Furthermore, acquirer firms have a lower financial leverage and a higher maturity dispersion of debt. These differences are also reflected in the bond ratings, which is on average A- for acquirers and BBB- for targets. Furthermore, we find that target bonds are more liquid with median transaction costs of 22 bp compared to 43 bp.

Focusing more on credit, liquidity and rollover risk, Figure 1 shows the distribution of the credit difference variable in both samples of acquirer and target bonds. The credit difference measure provides the difference between the rating grade of an acquirer (target) bond and the median rating of all target (acquirer) bonds of a particular deal. The vast majority of acquirer bonds is better rated than their target counterparts and vice versa. Target bonds have a lower rating by up to 4 grades in our sample. Figure 2 provides the average price dispersion of acquirer and target bond in a $\pm$ 40 weeks time window around the M&A deal to analyze liquidity. The transaction costs go down after the announcement day in both samples. However, for acquirer bonds transaction costs basically return to pre-announcement levels after 20 weeks, whereas we find a permanent drop for target bonds from around 39 bp to 33 bp. Thus, for target bonds we find a 15% decrease in transaction costs, i.e., an increase in liquidity after the announcement. Figure 3 shows the distribution of the maturity dispersion of debt for targets and acquirers. In both samples, the measure of dispersion clusters at the five to six range, but the target bond sample also has a cluster at the three to four range. Thus, an important part of the target companies shows a more concentrated maturity structure.

6.2 Abnormal returns

In this section, we analyze the abnormal announcement returns for acquirer and target bonds. We provide results for the overall sample and various subsamples analyzing the effect of differences in credit, liquidity and rollover risk on the returns. Table 2 reports the average return and respective standard errors for both the acquirer and target sample. We find a negative announcement return for acquirer bondholders of around -1.7 bp and a positive announcement return for target bondholders of around 40 bp. Both results are statistically significant at the 1% level based on a t-test and a rank-sum test. Thus, our results are in line with the existing literature agreeing that on average acquirer bondholders lose whereas target bondholders typically gain during M&A announcement events. Tables 3 and 4 provide results for various subgroups of acquirer and target bonds. Panel A is focused on the results for our three main variables of interest — credit difference, price dispersion, and debt dispersion.

Similar to, e.g., Billett et al. (2004) we start by splitting the sample according to these variables and then comparing the mean return of each group. We do this separately for acquirer and target bonds. We find that bonds with a positive credit difference, i.e., where the counterparty has less credit risk, always deliver higher announcement returns. However, this difference is only statistically significant for target bonds. Here, we find a price effect of 74 bp for target bonds that are linked to a better rated acquire and only 8 bp otherwise. Interestingly, we find a similar effect when separating target bonds into investment and speculative grade bonds (see Panel B). For investment grade we observe 29 bp and for speculative grade bonds 54 bp. The difference is again statistically significant at the 1% level. Thus, using just the rating grade information provides a similar result, but it is not as pronounced as when focusing on credit risk difference within a deal. These results are in general in line with existing literature, Billett et al. (2004) and Chen et al. (2020) provide similar result for credit difference.

Focusing on liquidity, we showed above that the price dispersion measure is changing from pre to post announcement period especially for target bonds. This decrease in transaction cost is also reflected in the announcement return of target bonds. We find an abnormal return of 18 bp for high liquidity bonds and 57 bp for low liquidity bonds. The difference is again significant at the 1% level. There is basically no effect for acquirer bonds. Analyzing the maturity dispersion of debt, we expect to find that target firms with concentrated maturity structures, i.e., low debt dispersion, which are acquired by larger firms with a spread out maturity structure, benefit because rollover risk is decreased. The opposite effect should hold for the acquirers. However, the effects for acquirers could be small as they are much larger on average. Here, we find that target bonds with a lower debt dispersion deliver 56 bp announcement return vs 24 bp announcement return for bonds from firms with a higher debt dispersion. This result is again significant at the 1% level. There is also the opposite effect for acquirer bonds. However, this effect is only around 1 bp and is not statistically significant. These results, together with the results on liquidity lead us to the conclusion that target firm bondholders have an even higher announcement return if a decrease in rollover risk can be expected.

Panels B, C and D of Tables 3 and 4 provide results on different groupings. Panel B groups bonds according to credit rating, offering size, and remaining time to maturity, i.e., bond-specific criteria. Panel C groups bonds according to the firms' financial leverage, size, and profit margin and Panel D accounts for deal-specific criteria such as industry, deal financing, and target size. Panel B and C provide splits in the dimension of our bond and firm controls that are used in the multivariate regression models. The deal-related splits are often applied in the literature on M&A transactions. We also use these deal related variables as control variables in the multivariate analysis.

As already mentioned, we find a significant difference in mean abnormal announcement returns when splitting target bonds into investment grade (+29 bp) and below investment grade (+54 bp). When analyzing the acquirer sample we cannot find any difference in announcement returns conditional on this split. A bond's offering size does not provide statistically significant difference neither for target nor acquirer bonds. The remaining time to maturity does not influence target bondholder announcement returns, i.e., we do not find any statistically significant differences in group means. We detect a statistically significant difference in the acquirer sample. More precisely, we find, that bonds with longer remaining time to maturity deliver lower announcement returns (0 bp vs -3 bp). The differences in announcement returns are very small with 3 bp, but it indicates that adding targets bonds with long TTM can potentially reduce refinancing pressure.

Turning to firm-specific variables (Panel C), we find the strongest effect for firm leverage. In line with the results for credit difference and rating grade, there are higher abnormal returns for high leverage target firms: 56 bp vs 27 bp. For acquirer bonds, we find that bonds of low leverage firms show a negative return of -3 bp, whereas there is -1 bp return for high leverage bonds. These results are consistent as the M&A deal mostly likely increases the overall leverage of the low leverage acquirer firms. There are no significant effects for firm size and profit margin concerning target firms. For acquirer firms, we find a significant lower abnormal return by 4 bp for low profit margin firms and a significant lower abnormal announcement return by 7 bp for small acquirers.

Panel D reports the result of the deal-related variables. We find for both target and acquirer bonds that a within industry deal leads to higher abnormal returns. For target bonds, this result is quite pronounced with 69 bp vs 31 bp. The difference is statistically significant at the 1% level. For acquire bonds, we find a difference of 3 bp with no statistical significance. In general, Chen et al. (2020) document the same result. Furthermore, we find more positive returns for deals financed without cash and deals with a small target. Billett et al. (2004) also find that bondholders of relatively small target firms have a significantly higher announcement return. For acquirer bondholders their results are mixed. Chen et al.

(2020) document that both, acquirer and target bondholders, experience larger announcement returns if the target's relative size is small. Overall, our deal-related results are in line with the previous literature.

6.3 Regression analysis

In this section, we report the results of our regression analysis, where we explain the announcement returns using bond-, firm- and deal-specific variables. In the first set of regressions, we focus on the effects of the credit difference, liquidity and maturity dispersion. In the additional regressions, we add bond-, firm- and deal-specific variables first separately and, then, together. Tables 5 and 6 show the results separately for acquirer and target bonds. In all setups heteroskedasticity robust standard errors are reported. Analyzing Regression (1) in Table 5, we confirm the results of the previous analysis for target bonds. The credit difference shows statistically significant results and also represent an important effect in economic terms. Furthermore, we confirm the result concerning liquidity. Target bonds with a higher price dispersion, i.e., lower liquidity, show significantly higher announcement returns in addition to the credit difference. There is no significant effect for the maturity dispersion. In general, maturity dispersion shows a high correlation with the liquidity variable and credit difference and these two variables dominate in the regression setup. In addition, we find a quite high R^2 with more than 30% showing that these variables are essential for explaining announcement returns.

Regressions (2) to (4) add various controls to the analysis. Regression (5) adds all variables. We focus on Regression (5). Adding all the control variables does not change the statistical and economic significance of the credit difference and liquidity variable. If target bonds have a lower rating than the acquirer bonds, we observe a 38 bp higher announcement return. A one standard deviation higher liquidity increases the announcement return by 22 bp. Interestingly, in the overall regression the time to maturity variable shows also a positive and significant parameter. Given that longer maturity bonds often show a lower liquidity, part of the overall liquidity effect is picked up by time to maturity. Note, that in Regressions (2) to (4) some additional variables show significant effects, e.g., the dummy variable representing within industry deals. However, in Regression (5) these results do not show any statistical significance. Thus, once we consider credit, rollover and liquidity risk, all other effects are of minor importance.

Analyzing the results for acquirer bond, see Table 6, we find in Regression (1) statistically significant results for credit difference and maturity dispersion in line with economic intuition. However, the variables show offsetting signs and provide a low R^2 of around 8%. Furthermore, the variables become insignificant once we add the various controls to the regression equation. In Regression (5) only the maturity dispersion variable shows a marginal, statistical significance. The economic effect is rather small. A one standard deviation higher maturity dispersion provides lower announcement returns of 3 bp. The direction of the effect is in line with the economic intuition that acquirer firms with a high maturity dispersion will have a more concentrated debt structure after the M&A deal, but the economic size of the effect is rather small. Thus, similar to the univariate analysis, we basically find no effect for the credit, liquidity and rollover variables. Analyzing the control variables in Regression (5), we confirm that using cash as method of payment reduces the announcement return. We find a stronger effect of 33 bp compared to the univariate analysis. Other variables show statistical significance as well. However, the economic impact is basically insignificant. For example, bonds with higher time to maturity show lower returns, but a one standard deviation change only leads to a change in return of 7 bp. Thus, we confirm the previous results that acquirer bonds are less affected by M&A deals as compared to target bonds.

Overall, the multivariate regression models confirm the univariate tests. Target firms are subject to significant wealth effects for bondholders in economic terms. M&A announcements lead to anticipated changes in the risk profiles of such bonds, i.e., changes in credit, liquidity and rollover risk, and, thus, to abnormal announcement returns. On the other hand, acquirer bond returns around acquisition announcements are not affected by anticipated changes in these risk factors — at least not in economic terms.

6.4 Robustness

In this section we present our set of robustness tests analyzing alternative model specifications and explanatory variables that could affect our findings. The tables presenting the results of these checks are reported in the Internet Appendix to conserve space. We find that all our main results hold.

Return calculation:

In this robustness test we show results when using a different methodology for the return calculation. First, we employ the closest two prices before and after the announcement in a ± 5 day window instead of all prices when computing the abnormal announcement returns. Tables 7 and 8 show the results for the unconditional and conditional univariate tests. All tests confirm the results presented in the main section of the paper. Also the multivariate results are consistent with these findings (Tables 9 and 10). Second, we compute the abnormal announcement returns using the average price ± 5 days around the announcement. The results of the univariate analysis are reported in Tables 11 and 12 and the results of the regression analysis in Tables 13 and 14. This robustness check is also in line with the main results only differing in the magnitude of the coefficients as returns are not adjusted for time differences, often resulting in multiday periods.

Regression analysis:

In this robustness test we adjust our regression setup. In particular, we cluster standard errors on a deal level to account for similar announcement returns across different bonds within one deal. Note that the target sample has on average 2.5 observations per deal with a standard deviation of 2.6, 60% of deals only have a single observation. The acquirer sample has on average 4.4 observations per deal with a standard deviation of 5.8 observations, 33% of deals have a single observation. Given these differences in the number of observations across deals and the small *effective number of clusters* (see Carter et al. (2017)), we use the approach of Jackson (2020) to estimate the covariance matrix.[8] Models (1) and (2) in Table 15 show the results when the standard errors are clustered on a deal level for target and acquirer bonds, respectively. The results of our analysis concerning target bonds are virtually unchanged. For acquirer bonds, the regression analysis even shows a small negative effect for the credit difference variable. Overall, these results strengthen our findings.

Explanatory variables:

In this robustness test we use different specifications for our main explanatory variables. First, we show results when directly using the credit difference measure instead of a dummy indicating a positive credit difference. Model (1) of Tables 16 and 17 presents the results. For target bonds the main conclusion is the same. Model (1) in Table 16 is basically the same as Model (5) in Table 5. Note, that the result concerning the credit difference is basically the same. When multiplying with the respective standard deviation the coefficient in Model (5) Table 5 is 19 bp and in Model (1) Table 16 20 bp. The estimate of the credit difference variable is less significant compared to the model in the main analysis, most likely as the difference between ratings is not perfectly identical across rating categories. Interestingly, the coefficient for credit difference in the acquirer sample becomes significantly negative. However, the effect is quite small. Second, we use as an alternative to the maturity dispersion measure the inverse of the Herfindahl index (see Choi et al. (2018)). Model (2) in Tables 16 and 17 presents the results when substituting the measure of debt dispersion with the inverse Herfindahl index. For target bonds the model stays again basically unchanged. Noteworthy, the coefficient for maturity dispersion in the acquirer sample is insignificant, in line with the univariate results. Model (3) shows the results when using the credit difference measure and the inverse Herfindahl index together. Interestingly, the coefficient for the inverse Herfindahl index becomes weakly significant in the target sample, strengthening the univariate result based on the maturity dispersion measure. The remaining inference is the same as above for

[8] We estimated all effective numbers of clusters using Model (5).

both samples. Overall, the changes of the explanatory variables strengthen our results and the alternative specifications lead to results that are even closer to our univariate analysis.

7 Conclusion

In this paper, we show that the price effect of target bonds in M&A announcements is to a large extent driven by changes in the underlying credit, liquidity and rollover risk. On the other hand, prices of bonds of acquirer firms are not subject to these effects, which can be rationalized by the large size differential between target and acquirer firms. Moreover, we document a 15% permanent increase in liquidity for target bonds, whereas the liquidity of acquirer bonds is not impacted in the long run.

Existing literature documents a credit risk effect on the announcement returns of bonds during M&As, which we confirm in our paper. Liquidity and rollover risk is — to the best of our knowledge — not considered as driver of price effects during M&A announcements so far. We establish this link with our empirical analysis. The dispersion of debt maturities in acquirer firms as well as the liquidity of their bonds is larger than for target firms. In an M&A announcement bondholders of the target firm anticipate that the liquidity of their bonds will rise, and that, due to the larger debt dispersion of the acquirer, rollover risk will be lower which makes refinancing cheaper and less risky.

We find that target bonds deliver an abnormal announcement return of 40 bp, whereas acquirer bonds lose on average during M&A announcements (−1.7 bp). Furthermore, target bonds that are rated worse than the bonds of the acquirer deliver significant larger announcements returns than bonds that are rated better than their counterparts. As our main results, we document that target bonds with low liquidity (57 bp vs 18 bp) and low debt dispersion (56 bp vs 24 bp) deliver higher abnormal announcement returns. These effects are robust across a set of econometric tests.

To conclude, we show that a significant portion of target bondholder wealth effects during

M&A announcements can be explained be anticipated changes in firm and bond risk profiles, i.e., changes in credit, liquidity and rollover risk.

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Figures & Tables

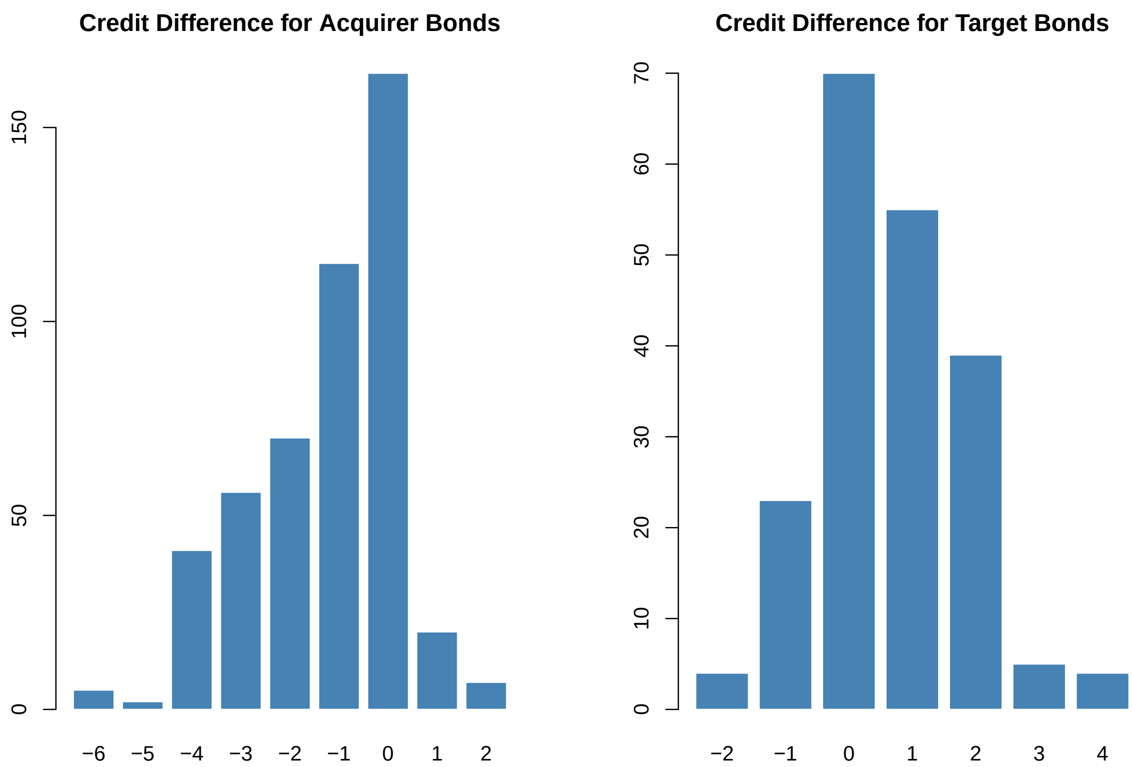

Figure 1: Distribution of Credit Difference.

This figure shows the distribution of the credit difference variable for acquirer and target bonds. Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

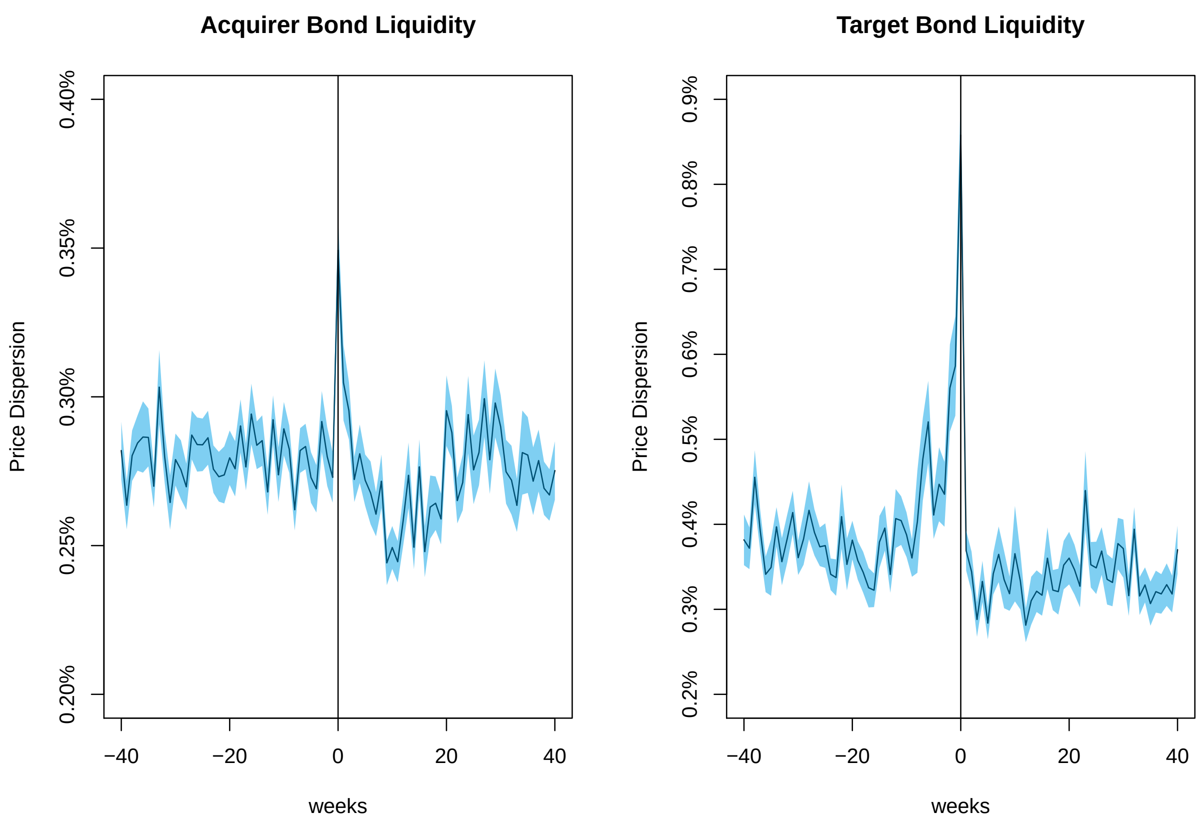

Figure 2: Acquirer and Target Bond Liquidity.

This figure shows the cross-sectional average bond liquidity for acquirer and target firms over time. Bond liquidity is measured by price dispersion, i.e., a transaction cost measure based on traded prices. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

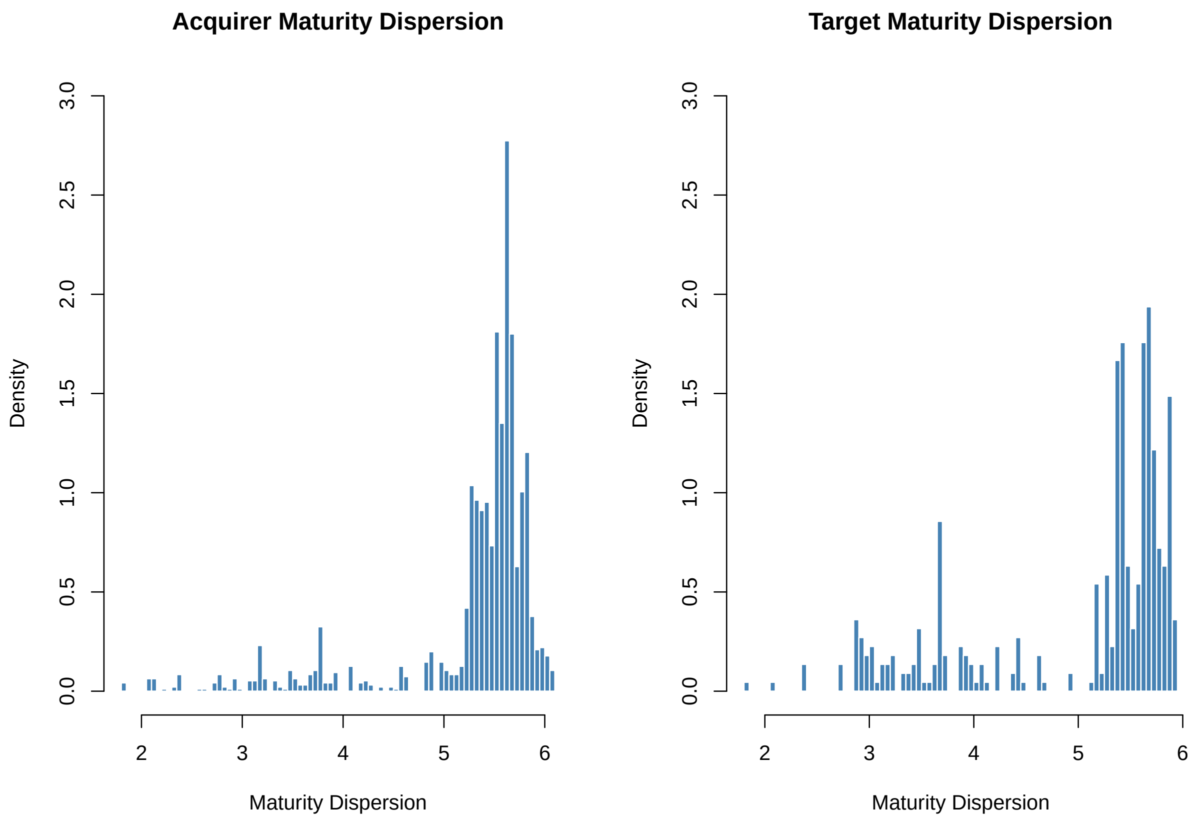

Figure 3: Distribution of Maturity Dispersion

This figure shows the distribution of the maturity dispersion variable for acquirer and target firms. Maturity dispersion measures the firm's concentration of its dept maturities in years. The lower the dispersion variable the more concentrated is the debt structure, increasing rollover risk. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

Table 1: Descriptive statistics on firm- and bond-level.

This table contains descriptive statistics on firms and their outstanding bonds at the time of M&A announcement events. Panel A represents acquirers and Panel B targets. First, we present firm level data: Total assets are reported in billions of USD. Financial leverage is defined as total liabilities over total assets. Maturity dispersion of the debt structure is measured in years. Second, we present bond level data: The bond's offering size is reported in millions of USD. TTM measures the remaining time to maturity in years. We convert all ratings into integers where AAA is one. Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. Price dispersion provides a transaction cost measure in %. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

	Mean	Median	Sdev	25%	75%	N
Panel A: Acquirer						
Firm level						
Total assets	148.31	32.41	320.30	14.07	107.97	377
Financial leverage	0.65	0.62	0.17	0.51	0.77	377
Maturity dispersion	4.92	5.40	1.07	4.36	5.62	400
# of bonds	4.78	3.00	5.90	1.00	6.00	400
Bond level						
Offering size	1238.31	1000.00	1162.50	600.00	1500.00	1911
TTM	9.33	6.10	9.29	3.18	9.50	1911
Rating	6.97	7.00	2.88	5.00	9.00	1911
Credit difference	-1.24	-1.00	1.52	-2.00	0.00	480
Price Dispersion	0.35	0.22	0.40	0.10	0.43	1260
Panel B: Target						
Firm level						
Total assets	39.79	8.62	123.32	3.83	23.95	124
Financial leverage	0.71	0.68	0.21	0.58	0.80	124
Maturity dispersion	4.46	4.44	1.17	3.41	5.61	143
# of bonds	3.10	1.00	3.14	1.00	4.00	143
Bond level						
Offering size	839.40	700.00	582.57	400.00	1000.00	444
TTM	8.84	6.13	8.13	3.82	9.07	444
Rating	10.32	9.00	3.03	9.00	13.00	444
Credit difference	0.67	1.00	1.17	0.00	1.00	200
Price Dispersion	0.88	0.43	1.24	0.18	1.04	327

Table 2: M&A bond announcement returns.

This table reports the mean and median abnormal announcement returns in a $\pm$5-day window for acquirer and target bonds in percent. Bootstrapped standard errors are reported below the statistics in parenthesis. Additionally, we report the p values of one sided t- and rank-sum tests. Panel A reports the results for the non-winsorized sample and Panel B for the sample winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Acquirer Bonds	Target Bonds
Panel A: Non-winsorized sample		
Mean	-0.0165^{***}	0.4031^{***}
	(0.0059)	(0.0598)
Median	-0.0089^{***}	0.1121^{***}
	(0.0041)	(0.0176)
p of t-test	0.0030	0.0000
p of rank-sum test	0.0002	0.0000
N	1911	444
Panel B: winsorized sample		
Mean	-0.0163^{***}	0.3675^{***}
	(0.0058)	(0.0451)
Median	-0.0089^{***}	0.1121^{***}
	(0.0041)	(0.0176)
p of t-test	0.0028	0.0000
p of rank-sum test	0.0002	0.0000
N	1911	444

Table 3: M&A bond announcement returns based on sample splits — acquirer bonds.

This table reports the mean abnormal announcement returns in a ±5-day window for acquirer bonds in percent. We compare subsample splits based on the median or defined groups according the variables on the left. In Panel A, we report splits according to risk-specific variables: Credit risk is represented by the credit difference measuring the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. Liquidity is measured by price dispersion, representing transaction costs. Maturity dispersion is representing the rollover risk. In Panel B, we report splits according to bond-specific variables based on investment grade vs speculative grade bonds, offering size and remaining time to maturity (TTM). In Panel C, we report splits according to firm-specific variables: Leverage is computed as total liabilities over total assets, firm size represents total assets and profit margin is defined as net income over sales. Panel D reports deal-specific splits: A deal is classified as within industry if both firms share the same SIC code. We compare deals financed with cash against non-cash deals. Target size is measured by the target's total assets. Bootstrapped standard errors are reported in the column labeled s.e., and N indicates the number of observations in each subsample. Additionally, we report test statistics of t-tests and p values of rank-sum tests. Return observations are winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

Panel A: Risk specific variables

	Mean	s.e.	N
Credit difference > 0	0.09	0.06	27
Credit difference ≤ 0	0.01	0.02	453
t-, p-value	1.33	0.19	
High liquidity	-0.01	0.01	684
Low liquidity	-0.03	0.01	576
t-, p-value	1.12	0.26	
High debt dispersion	-0.02	0.01	1330
Low debt dispersion	-0.01	0.01	581
t-, p-value	-0.75	0.45	

Panel B: Bond specific variables

	Mean	s.e.	N
Investment grade	-0.01	0.01	1748
Junk grade	-0.04	0.03	163
t-, p-value	0.80	0.42	
Small offering size	-0.02	0.01	858
Large offering size	-0.01	0.01	1053
t-, p-value	-0.76	0.45	
Short TTM	0.00	0.01	956
Long TTM	-0.03	0.01	955
t-, p-value	2.89	0.00	

Panel C: Firm specific variables

	Mean	s.e.	N
Low leverage	-0.03	0.01	780
High leverage	-0.01	0.01	1057
t-, p-value	-2.39	0.02	
Small firm	-0.06	0.02	353
Large firm	-0.01	0.01	1484
t-, p-value	-2.78	0.01	
Low profit margin	-0.04	0.01	747
High profit margin	-0.00	0.01	1090
t-, p-value	-2.89	0.00	

Panel D: Deal specific variables

	Mean	s.e.	N
Within industry	0.01	0.02	188
Between industry	-0.02	0.01	1723
t-, p-value	1.25	0.21	
Financed with cash	-0.04	0.01	1474
Financed without cash	0.07	0.01	437
t-, p-value	-6.63	0.00	
Small target	0.00	0.02	218
Large target	-0.03	0.02	300
t-, p-value	1.25	0.21	

Table 4: M&A bond announcement returns based on sample splits — target bonds.

This table reports the mean abnormal announcement returns in a ±5-day window for target bonds in percent. We compare subsample splits based on the median or defined groups according the variables on the left. In Panel A, we report splits according to risk-specific variables: Credit risk is represented by the credit difference measuring the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. Liquidity is measured by price dispersion, representing transaction costs. Maturity dispersion is representing the rollover risk. In Panel B, we report splits according to bond-specific variables based on investment grade vs speculative grade bonds, offering size and remaining time to maturity (TTM). In Panel C, we report splits according to firm-specific variables: Leverage is computed as total liabilities over total assets, firm size represents total assets and profit margin is defined as net income over sales. Panel D reports deal-specific splits: A deal is classified as within industry if both firms share the same SIC code. We compare deals financed with cash against non-cash deals. Target size is measured by the target's total assets. Bootstrapped standard errors are reported in the column labeled s.e., and N indicates the number of observations in each subsample. Additionally, we report test statistics of t-tests and p values of rank-sum tests. Return observations are winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

Panel A: Risk specific variables	Mean	s.e.	N	*Panel B: Bond specific variables*	Mean	s.e.	N
Credit difference > 0	0.74	0.11	103	Investment grade	0.29	0.05	300
Credit difference ≤ 0	0.08	0.03	97	Junk grade	0.54	0.09	144
t-, p-value	5.81	0.00		t-, p-value	-2.43	0.02	
High liquidity	0.18	0.05	109	Small offering size	0.31	0.06	297
Low liquidity	0.57	0.08	218	Large offering size	0.47	0.08	147
t-, p-value	-4.00	0.00		t-, p-value	-1.64	0.10	
High debt dispersion	0.24	0.05	269	Short TTM	0.28	0.05	219
Low debt dispersion	0.56	0.08	175	Long TTM	0.45	0.07	225
t-, p-value	-3.20	0.00		t-, p-value	-1.79	0.07	

Panel C: Firm specific variables	Mean	s.e.	N	*Panel D: Deal specific variables*	Mean	s.e.	N
Low leverage	0.27	0.08	131	Within industry	0.69	0.14	66
High leverage	0.56	0.07	218	Between industry	0.31	0.05	378
t-, p-value	-2.63	0.01		t-, p-value	2.42	0.02	
Small firm	0.40	0.07	166	Financed with cash	0.30	0.06	295
Large firm	0.51	0.08	183	Financed without cash	0.50	0.08	149
t-, p-value	-0.98	0.33		t-, p-value	-2.10	0.04	
Low profit margin	0.42	0.07	201	Small target	0.53	0.13	69
High profit margin	0.50	0.09	148	Large target	0.44	0.06	280
t-, p-value	-0.67	0.50		t-, p-value	0.63	0.53	

Table 5: Multivariate regressions for target bond returns.

This table reports the results of several multivariate regression models for target bonds. The dependent variable is represented by abnormal M&A announcement returns computed in percent using a ±5-day window. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	0.386**	0.347**	0.422**	0.275	0.380**
	(0.167)	(0.163)	(0.172)	(0.173)	(0.167)
Price Dispersion	0.500***	0.338***	0.451***	0.458***	0.244**
	(0.142)	(0.112)	(0.145)	(0.135)	(0.106)
Maturity Dispersion	0.015	0.012	−0.060	0.011	−0.057
	(0.060)	(0.060)	(0.057)	(0.066)	(0.070)
Firm Size		0.653			1.016
		(0.712)			(0.715)
Leverage		0.502			0.279
		(0.522)			(0.564)
Profit Margin		−0.247			−0.211
		(0.164)			(0.164)
Offering Size			0.301**		0.178
			(0.147)		(0.129)
Age			0.003		0.005
			(0.040)		(0.042)
TTM			0.017		0.024*
			(0.015)		(0.013)
Within Industry				0.400**	0.252
				(0.186)	(0.183)
Cash payment				−0.185	−0.040
				(0.147)	(0.177)
Constant	−0.168	−0.437	−0.204	−0.091	−0.360
	(0.313)	(0.458)	(0.311)	(0.414)	(0.479)
Observations	124	124	124	124	124
R^2	0.316	0.355	0.356	0.365	0.422
Adjusted R^2	0.299	0.322	0.323	0.338	0.365
Residual Std. Error	0.840 (df = 120)	0.826 (df = 117)	0.825 (df = 117)	0.816 (df = 118)	0.799 (df = 112)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 6: Multivariate regressions for acquirer bond returns.

This table reports the results of several multivariate regression models for acquirer bonds. The dependent variable is represented by abnormal M&A announcement returns computed in percent using a ±5-day window. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	0.241**	0.247***	0.212**	0.104	0.071
	(0.100)	(0.096)	(0.099)	(0.084)	(0.083)
Price Dispersion	0.030	0.012	0.081	0.019	0.042
	(0.067)	(0.071)	(0.070)	(0.060)	(0.064)
Maturity Dispersion	−0.095***	−0.093***	−0.078***	−0.079***	−0.052*
	(0.029)	(0.030)	(0.029)	(0.026)	(0.027)
Firm Size		0.109			−0.081
		(0.120)			(0.107)
Leverage		0.020			−0.441***
		(0.175)			(0.171)
Profit Margin		−0.588***			−0.570***
		(0.208)			(0.185)
Offering Size			−0.011		0.007
			(0.021)		(0.018)
Age			0.005		0.003
			(0.008)		(0.007)
TTM			−0.007***		−0.007***
			(0.002)		(0.002)
Within Industry				−0.013	0.004
				(0.034)	(0.033)
Cash payment				−0.275***	−0.332***
				(0.053)	(0.055)
Target Size				0.045	0.246
				(0.177)	(0.174)
Constant	0.463***	0.484**	0.426***	0.609***	0.896***
	(0.162)	(0.223)	(0.155)	(0.137)	(0.200)
Observations	309	309	309	309	309
R^2	0.079	0.103	0.135	0.233	0.347
Adjusted R^2	0.070	0.085	0.118	0.218	0.321
Residual Std. Error	0.270 (df = 305)	0.268 (df = 302)	0.263 (df = 302)	0.247 (df = 302)	0.231 (df = 296)

Note: *p<0.1; **p<0.05; ***p<0.01

Internet Appendix

Table 7: Unconditional univariate location tests. This table replicates the unconditional univariate location tests from the paper using the closet pre- and post-announcement price to calculate the abnormal announcement return for acquirer and target bonds and reports the mean and median abnormal announcement returns in percent. Bootstrapped standard errors are reported below the statistics in parenthesis. Additionally, we report the p values of one sided t- and rank-sum tests. Panel A reports the results for the non-winsorized sample and Panel B for the sample winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Acquirer Bonds	Target Bonds
Panel A: Non-winsorized sample		
Mean	-0.0250^{**}	0.6554^{***}
	(0.0137)	(0.0978)
Median	-0.0284^{***}	0.1528^{***}
	(0.0079)	(0.0306)
p of t-test	0.0352	0.0000
p of rank-sum test	0.0000	0.0000
N	1911	444
Panel B: winsorized sample		
Mean	-0.0230^{**}	0.5694^{***}
	(0.0135)	(0.0694)
Median	-0.0284^{***}	0.1528^{***}
	(0.0079)	(0.0306)
p of t-test	0.0452	0.0000
p of rank-sum test	0.0000	0.0000
N	1911	444

Table 8: Conditional univariate location splits. This table replicates the conditional univariate location tests from the paper using the closet pre- and post-announcement price to calculate the abnormal announcement return in percent. Only the splits for main variables of interest are shown. We compare subsample splits based on the median or defined groups according the variables on the left. We report splits according to risk-specific variables: Credit risk is represented by the credit difference measuring the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. Liquidity is measured by price dispersion, representing transaction costs. Maturity dispersion is representing the rollover risk. In Panel A we report the results for acquirer bonds and in Panel B for target bonds. Bootstrapped standard errors are reported in the column labeled s.e., and N indicates the number of observations in each subsample. Additionally, we report test statistics of t-tests and p values of rank-sum tests. Return observations are winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

Panel A: Acquirer bonds				*Panel B: Target bonds*			
	Mean	s.e.	N		Mean	s.e.	N
Credit difference > 0	0.17	0.09	27	Credit difference > 0	1.16	0.17	103
Credit difference ≤ 0	0.05	0.04	453	Credit difference ≤ 0	0.13	0.05	97
t-, p-value	1.14	0.26		t-, p-value	5.92	0.00	
High liquidity	-0.04	0.01	684	High liquidity	0.31	0.08	109
Low liquidity	-0.04	0.04	576	Low liquidity	0.93	0.13	218
t-, p-value	0.14	0.89		t-, p-value	-4.12	0.00	
High debt dispersion	-0.03	0.02	1330	High debt dispersion	0.40	0.09	269
Low debt dispersion	-0.02	0.02	581	Low debt dispersion	0.83	0.12	175
t-, p-value	-0.36	0.72		t-, p-value	-2.89	0.00	

Table 9: Multivariate regressions for target bond returns. This table replicates the multivariate regression analysis for target bonds from the paper using the closet pre- and post-announcement price to calculate the abnormal announcement return in percent. The dependent variable is represented by abnormal M&A announcement returns. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	0.640***	0.603**	0.672***	0.532**	0.548**
	(0.245)	(0.251)	(0.249)	(0.252)	(0.238)
Price Dispersion	0.736***	0.871***	0.686***	0.694***	0.846***
	(0.193)	(0.206)	(0.198)	(0.198)	(0.196)
Maturity Dispersion	0.035	0.029	−0.047	0.041	−0.015
	(0.088)	(0.099)	(0.089)	(0.088)	(0.103)
Firm Size		−1.214			−1.132
		(0.987)			(0.989)
Leverage		0.650			0.056
		(0.736)			(0.751)
Profit Margin		0.132			0.240
		(0.217)			(0.245)
Offering Size			0.428**		0.260
			(0.219)		(0.239)
Age			−0.006		−0.016
			(0.062)		(0.066)
TTM			0.014		0.005
			(0.019)		(0.018)
Within Industry				0.464*	0.404
				(0.276)	(0.312)
Cash payment				−0.149	−0.220
				(0.204)	(0.259)
Constant	−0.268	−0.686	−0.324	−0.284	−0.238
	(0.465)	(0.670)	(0.460)	(0.532)	(0.590)
Observations	124	124	124	124	124
R^2	0.319	0.335	0.345	0.344	0.375
Adjusted R^2	0.302	0.301	0.311	0.316	0.313
Residual Std. Error	1.267 (df = 120)	1.268 (df = 117)	1.258 (df = 117)	1.254 (df = 118)	1.256 (df = 112)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 10: Multivariate regressions for acquirer bond returns. This table replicates the multivariate regression analysis for acquirer bonds from the paper using the closet pre- and post-announcement price to calculate the abnormal announcement return in percent. The dependent variable is represented by abnormal M&A announcement returns. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	0.449**	0.528***	0.443**	0.088	0.101
	(0.175)	(0.177)	(0.212)	(0.172)	(0.208)
Price Dispersion	0.008	−0.051	0.043	−0.023	−0.049
	(0.221)	(0.213)	(0.237)	(0.183)	(0.189)
Maturity Dispersion	−0.197	−0.205*	−0.212	−0.181	−0.163
	(0.127)	(0.117)	(0.131)	(0.111)	(0.108)
Firm Size		0.548*			0.051
		(0.322)			(0.288)
Leverage		−0.457			−1.011**
		(0.437)			(0.476)
Profit Margin		−2.010**			−1.817**
		(0.923)			(0.852)
Offering Size			0.070		0.097**
			(0.046)		(0.042)
Age			0.011		0.003
			(0.021)		(0.019)
TTM			−0.005		−0.007
			(0.005)		(0.004)
Within Industry				−0.347***	−0.269***
				(0.097)	(0.083)
Cash payment				−0.695***	−0.835***
				(0.159)	(0.173)
Target Size				−0.159	0.042
				(0.300)	(0.286)
Constant	0.998	1.448*	0.998	1.609**	2.366***
	(0.690)	(0.856)	(0.685)	(0.666)	(0.851)
Observations	309	309	309	309	309
R^2	0.048	0.093	0.058	0.206	0.279
Adjusted R^2	0.038	0.075	0.039	0.191	0.250
Residual Std. Error	0.691 (df = 305)	0.677 (df = 302)	0.690 (df = 302)	0.634 (df = 302)	0.610 (df = 296)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 11: Unconditional univariate location tests. This table replicates the unconditional univariate location tests from the paper and reports the mean and median abnormal announcement returns in percent. The abnormal announcement return for acquirer and target bonds is calculated using the average price in a ±5 day window. Bootstrapped standard errors are reported below the statistics in parenthesis. Additionally, we report the p values of one sided t- and rank-sum tests. Panel A reports the results for the non-winsorized sample and Panel B for the sample winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Acquirer Bonds	Target Bonds
Panel A: Non-winsorized sample		
Mean	-0.0718^{**}	2.6849^{***}
s.e	0.0360	0.3988
Median	0.0027	0.6239^{***}
s.e	0.0234	0.1300
p of t-test	0.0233	0.0000
p of rank-sum test	0.1037	0.0000
N	1911	444
Panel B: winsorized sample		
Mean	-0.0674^{**}	2.2040^{***}
s.e	0.0356	0.2633
Median	0.0027	0.6239^{***}
s.e	0.0234	0.1300
p of t-test	0.0289	0.0000
p of rank-sum test	0.1039	0.0000
N	1911	444

Table 12: Conditional univariate location splits. This table replicates the conditional univariate location tests from the paper. The abnormal announcement return is calculated in percent using the average price in a ±5 day window. Only the splits for main variables of interest are shown. We compare subsample splits based on the median or defined groups according the variables on the left. We report splits according to risk-specific variables: Credit risk is represented by the credit difference measuring the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. Liquidity is measured by price dispersion, representing transaction costs. Maturity dispersion is representing the rollover risk. In Panel A we report the results for acquirer bonds and in Panel B for target bonds. Bootstrapped standard errors are reported in the column labeled s.e., and N indicates the number of observations in each subsample. Additionally, we report test statistics of t-tests and p values of rank-sum tests. Return observations are winsorized at the 1% level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations.

Panel A: Acquirer bonds				*Panel B: Target bonds*			
	Mean	s.e.	N		Mean	s.e.	N
Credit difference > 0	0.37	0.27	27	Credit difference > 0	4.56	0.63	103
Credit difference ≤ 0	0.00	0.09	453	Credit difference ≤ 0	0.62	0.21	97
t-, p-value	1.19	0.24		t-, p-value	5.76	0.00	
High liquidity	-0.00	0.04	684	High liquidity	1.12	0.31	109
Low liquidity	-0.15	0.08	576	Low liquidity	3.53	0.45	218
t-, p-value	1.61	0.11		t-, p-value	-4.32	0.00	
High debt dispersion	-0.08	0.04	1330	High debt dispersion	1.40	0.28	269
Low debt dispersion	-0.04	0.07	581	Low debt dispersion	3.45	0.46	175
t-, p-value	-0.55	0.58		t-, p-value	-3.65	0.00	

Table 13: Multivariate regressions for target bond returns. This table replicates the multivariate regression analysis for target bonds from the paper. The abnormal announcement return is calculated in percent using the average price in a ±5 day window. The dependent variable is represented by abnormal M&A announcement returns. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	2.832***	2.471**	3.283***	2.111*	2.531**
	(1.088)	(1.093)	(1.174)	(1.111)	(1.102)
Price Dispersion	2.648***	1.985***	2.367***	2.376***	1.537**
	(0.698)	(0.617)	(0.709)	(0.675)	(0.646)
Maturity Dispersion	0.103	0.113	−0.094	0.054	−0.202
	(0.388)	(0.413)	(0.358)	(0.429)	(0.463)
Firm Size					
		(0.000)			(0.000)
Leverage		4.921			4.499
		(3.415)			(3.886)
Profit Margin		−1.531			−1.290
		(1.006)			(0.998)
Offering Size					
			(0.000)		(0.000)
Age			−23.856		−29.094
			(96.660)		(97.795)
TTM			42.643		51.829
			(35.156)		(31.573)
Within Industry				2.463**	1.577
				(1.212)	(1.131)
Cash payment				−1.277	−1.016
				(0.988)	(1.047)
Constant	−0.827	−3.815	−0.678	−0.132	−2.586
	(2.060)	(2.450)	(2.055)	(2.716)	(3.182)
Observations	124	124	124	124	124
R^2	0.281	0.309	0.302	0.332	0.366
Adjusted R^2	0.263	0.279	0.272	0.304	0.316
Residual Std. Error	5.307 (df = 120)	5.246 (df = 118)	5.271 (df = 118)	5.156 (df = 118)	5.110 (df = 114)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 14: Multivariate regressions for acquirer bond returns. This table replicates the multivariate regression analysis for acquirer bonds from the paper. The abnormal announcement return is calculated in percent using the average price in a ±5 day window. The dependent variable is represented by abnormal M&A announcement returns. Model (1) considers the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Model (2) adds firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Model (3) adds bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Model (4) adds deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. Model (5) includes all control variables. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:				
	Announcement Return				
	(1)	(2)	(3)	(4)	(5)
Credit Difference Dummy	1.156**	1.083**	1.029*	0.415	0.230
	(0.568)	(0.537)	(0.572)	(0.499)	(0.508)
Price Dispersion	0.203	0.064	0.456	0.142	0.226
	(0.407)	(0.429)	(0.430)	(0.358)	(0.390)
Maturity Dispersion	−0.790***	−0.732***	−0.725***	−0.725***	−0.561***
	(0.239)	(0.198)	(0.232)	(0.207)	(0.164)
Firm Size					
		(0.000)			(0.000)
Leverage		0.112			−2.730***
		(0.687)			(0.961)
Profit Margin		−3.859**			−4.081**
		(1.769)			(1.608)
Offering Size					
			(0.000)		(0.000)
Age			10.139		4.841
			(17.107)		(14.846)
TTM			−13.249***		−13.569***
			(4.712)		(4.720)
Within Industry				−0.311	−0.161
				(0.205)	(0.187)
Cash payment				−1.467***	−1.885***
				(0.289)	(0.335)
Target Size					
				(0.000)	(0.000)
Constant	3.965***	4.014***	3.797***	4.931***	6.810***
	(1.319)	(1.280)	(1.284)	(1.218)	(1.359)
Observations	309	309	309	309	309
R^2	0.115	0.146	0.154	0.232	0.342
Adjusted R^2	0.106	0.132	0.140	0.219	0.322
Residual Std. Error	1.562 (df = 305)	1.539 (df = 303)	1.532 (df = 303)	1.460 (df = 303)	1.360 (df = 299)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 15: Multivariate regressions for target and acquirer bond returns with clustered standard errors. This table reports the results of multivariate regression models for target and acquirer bonds. The dependent variable is represented by abnormal M&A announcement returns computed in percent using a ±5-day window. Model (1) is estimated using target bond returns and Model (2) is estimated using acquirer bond returns. Both models consider the main variables of interest: Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal and is represented in the regressions by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Additionally, we add firm, bond and deal control variables. Firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. All variables are winsorized at the 1% level. The reported standard errors are clustered on a deal level. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:	
	Announcement Return	
	(1)	(2)
Credit Difference	0.177**	−0.021
	(0.089)	(0.025)
Price Dispersion	0.236**	0.049
	(0.118)	(0.040)
Maturity Dispersion	−0.157	0.020
	(0.123)	(0.029)
Firm Size	0.994	−0.192
	(0.969)	(0.255)
Leverage	0.077	−0.300
	(0.675)	(0.249)
Profit Margin	−0.197	−0.645**
	(0.257)	(0.291)
Offering Size	0.161	−0.007
	(0.166)	(0.022)
Age	0.006	0.002
	(0.036)	(0.006)
TTM	0.027**	−0.008***
	(0.010)	(0.002)
Within Industry	0.230	−0.001
	(0.276)	(0.057)
Cash payment	−0.088	−0.368***
	(0.252)	(0.074)
Target Size		0.300
		(0.287)
Constant	0.152	0.511***
	(0.658)	(0.193)
Observations	124	309
R^2	0.442	0.345
Adjusted R^2	0.387	0.318
Residual Std. Error	0.785 (df = 112)	0.231 (df = 296)
F Statistic	8.063*** (df = 11; 112)	12.971*** (df = 12; 296)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 16: Multivariate regressions for target bond returns with levels of credit difference and Herfindahl index. This table reports the results of the estimation of the multivariate regression models in the paper using different explanatory variables for credit and rollover risk. The dependent variable is represented by abnormal M&A announcement returns computed in percent using a ±5-day window. The first three variables in each model represent the main variables of interest. Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. In Model (2) it is represented by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Also the inverse Herfindahl index is measured in years. Additionally, we add firm, bond and deal control variables. Firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:		
	Announcement Return		
	(1)	(2)	(3)
Credit Difference	0.175*		0.177*
	(0.099)		(0.098)
Credit Difference Dummy		0.345**	
		(0.166)	
Price Dispersion	0.272**	0.226**	0.236**
	(0.106)	(0.105)	(0.106)
Maturity Dispersion	−0.065		
	(0.072)		
Maturity Dispersion (Herfindahl index)		−0.121	−0.157*
		(0.087)	(0.086)
Firm Size	1.045	0.948	0.994
	(0.732)	(0.719)	(0.733)
Leverage	0.068	0.289	0.077
	(0.618)	(0.542)	(0.592)
Profit Margin	−0.177	−0.230	−0.197
	(0.177)	(0.164)	(0.176)
Offering Size	0.176	0.162	0.161
	(0.128)	(0.127)	(0.126)
Age	0.013	0.0003	0.006
	(0.039)	(0.042)	(0.041)
TTM	0.026*	0.024*	0.027**
	(0.013)	(0.013)	(0.013)
Within Industry	0.316	0.192	0.230
	(0.197)	(0.173)	(0.184)
Cash payment	−0.114	−0.025	−0.088
	(0.179)	(0.171)	(0.167)
Constant	−0.132	−0.153	0.152
	(0.466)	(0.521)	(0.518)
Observations	124	124	124
R^2	0.430	0.428	0.442
Adjusted R^2	0.374	0.372	0.387
Residual Std. Error (df = 112)	0.794	0.795	0.785
F Statistic (df = 11; 112)	7.686***	7.618***	8.063***
Note:	*p<0.1; **p<0.05; ***p<0.01		

Table 17: Multivariate regressions for acquirer bond returns with levels of credit difference and Herfindahl index. This table reports the results of the estimation of the multivariate regression models in the paper using different explanatory variables for credit and rollover risk. The dependent variable is represented by abnormal M&A announcement returns computed in percent using a ±5-day window. The first three variables in each model represent the main variables of interest. Credit difference measures the difference between the rating of a particular bond and the median rating of all counterparty bonds in an M&A deal. In Model (2) it is represented by a dummy set to one if this difference is positive and to zero otherwise. Price dispersion measures the transaction costs based on traded prices in %. Maturity dispersion of the debt structure is measured in years. Also the inverse Herfindahl index is measured in years. Additionally, we add firm, bond and deal control variables. Firm controls: Firm size is measured using a firm's total assets (in billions of USD), leverage is computed as total liabilities over total assets and profit margin is defined as net income over sales. Bond controls: Offering size is measured in millions of USD. Age and time to maturity (TTM) of the bond are measured in years. Deal controls: A deal is classified as within industry if both firms share the same SIC code and we compare deals financed with cash vs non-cash deals. All variables are winsorized at the 1% level. The reported standard errors are heteroskedasticity robust. The sample consists of all US corporate bonds that are subject to an M&A announcement event with a deal value above one billion USD in the period mid 2002 to September 2018, resulting in 2355 bond-deal observations. The statistical significance of each estimate is indicated by $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	Dependent variable:		
	Announcement Return		
	(1)	(2)	(3)
Credit Difference	-0.018^{**}		-0.021^{**}
	(0.009)		(0.009)
Credit Difference Dummy		0.053	
		(0.100)	
Price Dispersion	0.041	0.048	0.049
	(0.065)	(0.065)	(0.066)
Maturity Dispersion	-0.052^{*}		
	(0.028)		
Maturity Dispersion (Herfindahl index)		0.005	0.020
		(0.025)	(0.022)
Firm Size	−0.129	−0.141	-0.192^{**}
	(0.103)	(0.105)	(0.097)
Leverage	-0.366^{**}	-0.384^{**}	-0.300^{*}
	(0.175)	(0.167)	(0.169)
Profit Margin	-0.620^{***}	-0.590^{***}	-0.645^{***}
	(0.195)	(0.187)	(0.194)
Offering Size	0.003	−0.00003	−0.007
	(0.018)	(0.018)	(0.019)
Age	0.005	0.001	0.002
	(0.007)	(0.007)	(0.007)
TTM	-0.007^{***}	-0.008^{***}	-0.008^{***}
	(0.002)	(0.002)	(0.002)
Within Industry	−0.006	0.007	−0.001
	(0.033)	(0.033)	(0.033)
Cash payment	-0.350^{***}	-0.344^{***}	-0.368^{***}
	(0.054)	(0.059)	(0.056)
Target Size	0.282	0.249	0.300^{*}
	(0.175)	(0.175)	(0.176)
Constant	0.862^{***}	0.600^{***}	0.511^{***}
	(0.203)	(0.144)	(0.139)
Observations	309	309	309
R^2	0.353	0.337	0.345
Adjusted R^2	0.326	0.310	0.318
Residual Std. Error (df = 296)	0.230	0.232	0.231
F Statistic (df = 12; 296)	13.439^{***}	12.513^{***}	12.971^{***}
Note:			*p<0.1; **p<0.05; ***p<0.01