

Credit Ratings and the Premiums Paid in Mergers and Acquisitions

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Highlights

- We study the effects of credit ratings on the premium paid by bidder firms.
- Premium paid for rated targets is lower than premium for nonrated targets.
- Acquisitions of rated targets lead to superior bidders' operating performance.
- It is the presence of ratings rather than the rating quality that counts.

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Abstract

We examine the contribution of credit ratings in the information set that bidders use to price targets. Using a sample that includes U.S. domestic deals completed between 1986 and 2012, we find that the presence of ratings significantly affects the M&A premiums paid in mergers and acquisitions (M&As). M&A premiums paid are lower in deals involving rated as opposed to nonrated firms. Assuming that the presence of ratings mitigates the problem of information asymmetry and allows bidders to pay a fair price for a target, then the post-M&A performance of bidders of rated targets would be superior. Indeed, we find that the presence of ratings and bidders' post-M&A operating performance are positively related.

JEL Classification: G14; G24; G34

Keywords: Credit Ratings, Mergers and Acquisitions, Premiums

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1. Introduction

Bidders' ability to select between good and bad targets is not always perfect. Thus, the premiums paid in mergers and acquisitions (M&As) may be suboptimal when the bidder miscalculates the true potential of a target firm. We study how credit ratings on target firms' bonds assist bidder firms in their determination of target firms' quality and the M&A premium paid.

The information gleaned from credit rating agencies (CRAs) would assist bidders to distinguish better between targets. By using ratings as an independent, unbiased "second opinion," a bidder can more accurately match the premium it pays to the true worth of the target. The overall result should be a more efficient allocation of capital.¹ The beneficial effects of CRAs in the reduction of information asymmetry amongst investors are examined in Partnoy (1999), White (2002), Schwarcz (2002), Carron *et al.* (2003), Bank for International Settlements (2005), Coffee Jr (2006), Becker and Milbourn (2011), Deb *et al.* (2011), Opp *et al.* (2010), Rousseau (2012), Kiff *et al.* (2012) and Fulghieri *et al.* (2014).

While CRAs' role is significant, it is not intended to guide bidders and targets in the M&A market. The contribution of CRAs is highly significant in the market for funds where lenders assess borrowers. Nonetheless, we are motivated to explore the marginal contribution of credit ratings in the mix of information that investors use in pricing targets as there is some overlap between the information produced by CRAs and those sought by M&A investors—for example, they use many of the same financial ratios. Furthermore, while there is a host of opinion products out there, we consider only the ratings supplied by the big three CRAs, i.e.,

¹ See also Standard & Poor's (2012)

Standard & Poor's (S&P), Moody's, and Fitch Group, which control the lion's share of the market.

A bidder has every incentive to see that the amount paid for a target in an M&A transaction is a true reflection of its net worth. In their attempt to minimize the likelihood of overpaying for targets, bidders will benefit from the checks and balances performed by CRAs. Rating agencies are experts at collecting and processing financial information and use sophisticated—at times more accurate—methodologies to assess the credit worthiness of a company (also see Yi and Mullineaux (2006)). CRAs are often privy to information that managers are reluctant to elaborate in public to preserve from competition; examples include acquisition plans and business strategies (Ederington & Yawitz 1985; Covitz & Harrison 2003; Kisgen 2006, 2009). We can draw similar arguments for targets assessing bidder shares in stock swaps.

Using a sample of U.S. domestic M&A deals between 1986 and 2012, we find that the premium paid is lower in deals where either one or both parties to the transaction is rated.² We also find that ratings explain the differences in bidders' operating performance post-acquisition, i.e., rated firms exhibit superior performance compared to firms without ratings. Interestingly, we find that the presence of a rating, rather than the quality of the rating (for example, investment grade versus junk bonds), influences the M&A premium paid. This finding further attests to the role of credit rating in reducing information asymmetry. Our results are robust to alternative techniques used to control for potential endogeneity bias, to controlling for deal, bidder and target characteristics, and to different sample periods. Our findings complement the growing literature on the effects of credit ratings on corporate finance decisions (for example, Liu and Malatesta (2006) and An and Chan (2008)). They

² Henceforth, a rated company is assumed to be one with outstanding fixed income securities that are rated by one of the three credit rating agencies Standard & Poor's (S&P), Moody's, and Fitch Group Ratings Services.

find that issuing firms with credit ratings are less underpriced than those without credit ratings; our findings are consistent with the above papers.

The rest of the paper proceeds as follows. In Section 2, we provide background information on Standard & Poor's (S&P), Moody's, and Fitch Group ratings services. In Section 3, we perform a literature review and formulate our hypotheses. We present the data in Section 4. In Section 5, we discuss our empirical findings. We conclude the paper in the final section.

2. Background Information and Credit Rating Agencies (CRAs)

A credit rating is defined as an opinion and a report on an entity's creditworthiness (i.e., its ability to repay its debt). The three leading CRAs are Standard & Poor's, Moody's Investors Service and Fitch Ratings. They use graduated scales via their nomenclature to rank creditworthiness.

In summary form, their ratings are regrouped into four categories: Group 1 includes AAA, AA (S&P, Fitch) and Aaa, Aa (Moody's). Corporations with those ratings exhibit high ability to repay debt. Group 2 includes A, BBB (S&P, Fitch) and A, Baa (Moody's); their debt is also considered safe but less than Group 1. Groups 1 and 2 are considered to be investment grade. Group 3 includes BB, B, CCC, CC, (S&P, Fitch) and Ba, B, Ca (Moody's). They are of lower credit quality, risky and are the first grouping in the junk category. Group 4 includes C, D (S&P, Fitch) and C (Moody's); these are companies closest to default. The preceding entry in each group is of superior quality than the succeeding one (for example AAA is better than AA in Group 1). The CRAs apply further refinements within each category with S&P and Fitch adding a "+" or a "-" sign next to each rating and Moody's adding a number 1, 2 or 3 next to each (whereby "+" is better than "-" and 1 is better than 2).

3. Literature Review

In this section, we review the literature that link credit ratings with equity valuation in corporate finance. Realdon (2013) illustrates the linkage between credit risk and equity valuation, and how credit risk depresses price-to-earnings and price-to-book value ratios. Odders-White and Ready (2006) analyse the relationship between credit ratings and information asymmetry and find that equity markets' liquidity is weaker when ratings are inferior. He *et al.* (2011) find that when a firm's bond rating is upgraded, its stock information asymmetry and its analysts' earnings forecast dispersion are significantly reduced, while the institutional equity holdings of its shares are significantly increased. Hand *et al.* (1992) and Ederington and Goh (1998) find that investors penalize the stock of companies that suffer a bond rating downgrade.

Bosch and Steffen (2011) find that the certification effect of ratings is largest for private firms. They also find that the marginal effect of being stock exchange listed is insignificant once these firms are rated; and that foreign banks and non-bank investors are reluctant to lend to nonrated firms. Their research highlights how credit ratings improve access to corporate finance.

Chou and Cheng (2012) find that the existence of credit ratings is associated with a lower negative effect of diversification. Both a change in firm status from nonrated to rated and a change in rating level from low to high lead to a significant reduction in the diversification discount. They further find that the market has a less negative reaction to rated and higher-rated firms around the announcement of diversifying mergers. Gropp *et al.* (2011) find that bidder gains from a merger are significantly smaller if the bidder is rated by a major rating agency than if the bidder is nonrated. Karampatsas *et al.* (2014) find that bidders

holding a credit rating are more likely to use cash financing in a takeover because they have higher debt capacity.

Hypotheses

This section is divided into two: first we formulate our hypotheses concerning the acquisitions of rated targets. Next, we formulate our hypotheses regarding the choices made by rated bidders.

Hypotheses on Rated Targets

To the extent that ratings mitigate information asymmetry, the current market value of the rated target firm should be close to its true worth. All other things being equal, there is little need to offer a price that is too different from the rated target's current market value. The existence of ratings diminishes the prospect that rated firms are underpriced since they are already informationally transparent, which reduces ambiguity about their true value (also see Liu and Malatesta, 2006). The lack of discrepancy between the offer price and the rated firm's current value is also documented in the IPO literature. An and Chan (2008) find that ratings reduce price revisions during the book-building process and, therefore, there is little uncertainty about the value of the firm. Consistent with their thesis, the authors find that issuers with credit ratings are underpriced significantly less than firms without credit ratings. The above arguments lead to the testable hypothesis that M&A premiums, i.e., the excess of the offer price over the target's market value, are low in acquisitions of rated targets.

H1: The M&A premium is lower in acquisitions of rated targets compared to nonrated firms.

Next, assume that good targets sell for 100M while bad targets sell for 20M. Under perfect information asymmetry, bidders are unaware of the real worth of a target. Since there

is a chance that every target can either be good or bad, buyers will only pay a price in between 20M and 100M. Against this backdrop, good targets will not be put up for sale if they cannot fetch 100M apiece. Under perfect information asymmetry, we end up with a market full of lemons (Akerlof, 1970).

By reviewing the credit ratings, the bidder improves its assessment of the target's net worth and pays the correct price. Published credit ratings therefore partially resolve the information asymmetry dilemma and, in the process, bring both good and bad targets to the market. Thus, in the world without ratings, bidders can only buy lemons, which will hinder their post-acquisition performance. On the other hand, using ratings to review the valuation of a target firm improves the bidder's ability to pay a fair price. This leads to the testable hypothesis that bidders operating performance is superior in deals involving rated, as opposed to nonrated targets.

H2: The acquisitions of rated targets yield higher bidder operating performance than the acquisitions of nonrated targets.

Hypotheses on Rated Bidders

Half of the bidders surveyed by Standard & Poor's in a study of 150 large U.S. M&A deals since 2000 have seen their credit ratings dropped.³ A bidder can suffer a rating downgrade as a consequence of overpaying for a target. The risk is that an oversized fee in non-stock swaps, in particular, has either taken away prized operating cash flow or loaded the company with more debt or magnified the risk profile of the combined entity. There is a real risk that CRAs will downgrade a bidder's rating if the acquisition worsens the cash flow and

³ Strategic Acquirers Jeopardize Credit Ratings | CFO. 2014. Strategic Acquirers Jeopardize Credit Ratings | CFO. [ONLINE] Available at: <http://ww2.cfo.com/ma/2013/09/strategic-acquirers-jeopardize-credit-ratings/>. [Accessed 05 March 2014].

debt profile of the firm.⁴ In addition, Boot *et al.* (2006) and Gropp *et al.* (2011) argue that constraints imposed upon management by means of credit ratings force them to optimize their investment policy to avoid impacting their cost of capital adversely. Thus, rated firms are less likely to overpay and/or pay a lower M&A premium so as not to jeopardize their credit rating and cost of capital. We test whether rated companies pay lower premiums in M&A deals.

H3: Rated bidders pay lower M&A premiums compared to nonrated bidders.

Given the hypothesized inverse relationship between bidder ratings and M&A premiums paid, we would expect lower-rated firms to be more preoccupied with their ratings (especially those at the border between investment grade and junk status). Thus, we test whether the rating level is inversely related to the M&A premium paid. The counterargument is that in a low interest rate environment, as is often the case in the U.S., the interest rate differential between adjacent rating categories is so slender that bidders are unconcerned with marginal shifts in their ratings and the benefit of funding leveraged deals in a low-interest environment takes precedence.

H4: Bidder ratings are inversely related to M&A premiums.

4. Data

Our sample includes U.S. domestic M&As between 1986 and 2012. We consider completed deals only. Both bidders and targets are listed either on the NYSE, AMEX or NASDAQ. We exclude deals with no reported data on the premium paid as well as reported premiums in excess of 100%. We require that both parties have stock price data in the Center for Research in Security Prices (CRSP) database and accounting data in COMPUSTAT. We remove firms in the financial (SIC codes 6000-6999) and utility sectors (SIC codes 4900-

⁴ *Ibid.* for anecdotal evidence.

4999). Bond rating data are downloaded from the Bloomberg database. The final sample includes 2,321 M&A deals.

We present the sample distribution in Table 1. The number of M&A transactions increased from 120 in 1995 to 203 in 1999 but fell to 161 in 2000 and 65 in 2002 as well as in the years coinciding with the 2007-2009 U.S. subprime mortgage crisis. Sixty-eight percent of the targets and bidders share the same two-digit SIC codes. The percentage of hostile bids is very low at 1.55%. Multiple bidders appear in 4.61% of the deals. Cash-only deals represent 31% of the sample. High-tech firms represent 45.37% of bidders and 40.80% of targets. Seventy-nine percent of the bidders and 95% of the targets use the services of at least one investment bank to advise on the deal.

[INSERT TABLE 1 ABOUT HERE]

In Panel C of Table 1, we report the sample distribution by ratings from the three CRAs, i.e., Standard & Poor's (S&P 2012), Moody's, and Fitch Group. Bidders are more likely to be rated than target firms (30.72% versus 10.17%). The sample distribution by CRAs follows a similar trend. Out of those with ratings, 74.47% of bidders and 50.42% of targets are rated as investment grade. In 25.74% of the deals, the target carries a higher rating than the bidder.

Deal, bidder and target characteristics are reported in Table 2. The mean and median deal values are \$1,416 million and \$254 million, respectively. The mean and median figures for enterprise value are \$2,115 million and \$367 million, respectively.⁵

[INSERT TABLE 2 ABOUT HERE]

⁵ Enterprise value is calculated by multiplying the number of shares outstanding (from the most recent balance sheet released prior to the announcement of the transaction) with the offer price and then adding the cost of convertible securities, short-term debt, straight debt, and preferred stock minus cash and marketable securities.

We present three measures of M&A premium. *Premium4Week* is defined as the excess of the offer price over the target stock price four weeks prior to the M&A announcement (expressed in percentage)—for example, if the offer price is 140 and the target's stock price is 100, then *Premium4Week* is 40%. We use this measure extensively in our later analyses as it excludes the effects of the run-up in the target's stock price immediately prior to the M&A announcement (Schwert, 1996). The mean and median values of *Premium4Week* are 44.481% and 37.605%, respectively.

We also report *Premium1Day* and the ratio of the deal value to target's enterprise value as alternative measures of M&A premium. The mean and median values of *Premium1Day* are 33.191% and 28.470%, respectively. The average ratio of deal value to target's enterprise value is 67%.

The mean and median percentages of shares acquired in the M&A deals sampled are 98.84% and 100%, respectively. The mean and median percentages of deals that are cash settled are 41.59% and 21.10%, respectively. The corresponding figures for stock payments are 50.19% and 53.45%, respectively. Based on the reported total assets, bidders are close to 10 times larger than targets. Based on values of market capitalization, they are 12 to 14 times bigger.

5. Empirical Findings

5.1. M&A Premium between Rated and Nonrated Firms

We classify the deals based on the bidder and target ratings and compare the M&A premium paid between rated and nonrated firms. We present our findings in Table 3. Using *Premium4Week*, the mean premium paid in deals involving a rated target as opposed to a nonrated one is lower by 8.84% (significant at the 5% level; see Panel A). Mean premium is

lower by 5.19% in deals with a rated bidder. A similar pattern emerges using the other two proxies for M&A premium, i.e., *Premium1Day* and the ratio of the deal value-to-the target's enterprise value. The difference persists irrespective of bidder ratings. These findings are consistent with hypothesis 1.

Consistent with hypothesis 3, the M&A premium paid by rated bidders is significantly lower than that paid by nonrated bidders. Using *Premium4Week* (*Premium1day*), the mean premium paid by rated bidders is 5.186% (2.156%) lower than that of nonrated bidders.

[INSERT TABLE 3 ABOUT HERE]

5.2. M&A Premium by Rating Quality

The results from Panel A of Table 3 suggest that the presence of credit ratings affects the premium paid in M&A transactions. In Panel B, we test whether the M&A premiums differ by rating quality. We divide the M&A deals between investment grade and junk category based on either party's credit rating. We first compare the M&A premiums between deals involving targets that are rated investment grade and those rated in the junk category. Neither the mean nor the median differences are statistically significant. Our tests yield similar findings when we use bidders' ratings and, therefore, do not support hypothesis 4. We also partition the sample into two based on whether the target's rating is superior to/ inferior to the bidder's rating; and the difference in M&A premiums isn't significant. Thus, the univariate tests suggest that rating quality does not affect the premium paid in M&A deals. An and Chan (2008) also find that credit rating levels do not have a significant effect on IPO underpricing, which leads the authors to conclude that with ratings, it is the value certainty that matters rather than the value *per se*. We find that this effect of ratings holds true in M&A market too.

5.3. Multiple Regressions of M&A Premiums

To control for endogeneity and sample selection bias, we perform a two-step estimation whereby in the first stage a probit model (equation 1) is used to predict the probability of a bidder selecting a target with credit ratings and in the second stage, the inverse Mills' ratio (*INVMILLS*) is included as a regressor in the cross-sectional analysis of M&A premiums (equation 2).⁶

$$\begin{aligned} RATED_i = & \beta_0 + \beta_1 DEALRATIO_i + \beta_2 ACQIB + \beta_3 TGTIB + \beta_4 CASH_i \\ & + \beta_5 RELATED_i + \beta_6 TGTHITECH_i + \beta_7 MKBK_i + \beta_8 DEBT_i + \epsilon_i \end{aligned} \quad (1)$$

where, the dependent variable *RATED* takes a value of 1 in M&As where either party carries a credit rating, else it takes a value of zero; the independent variables are the deal ratio (*DEALRATIO*), which is the ratio of the deal value-to-bidder market capitalization; dummy variables representing deals when the bidder hires the services of an investment bank to advise on the deal (*ACQIB*), the target uses an investment bank (*TGTIB*), cash-only bids (*CASH*), bids where the bidder and the target share the same two-digit SIC codes (*RELATED*), and high-tech targets (*TGTHITECH*). We also use the following control variables: industry-adjusted market-to-book (*MKBK*) and debt ratios (*DEBT*). The corresponding median for the industry—based on the two-digit SIC codes—is subtracted from the raw figure to obtain the industry-adjusted figure. We hypothesize that bidders are more likely to select rated targets when the deal ratio is high, in cash deals, in the high-tech industry and when the target is highly indebted as the risks of failure is high.

⁶ The inverse Mill's ratio is the ratio of a probability density function to the cumulative density function of a distribution. We include it as an additional explanatory variable in the regression to control for possible selection bias.

We present the results from running the probit regression in Table 4. In the first regression, we estimate the likelihood of a bidder choosing a target with credit ratings. We find that bids for targets with credit ratings are associated with higher values of deal ratio and higher values of target debt. Related acquisitions as well as those where the bidder hires the services of an investment bank to advise on the deal are also associated with M&A deals whereby a target is rated.

[INSERT TABLE 4 ABOUT HERE]

In the second regression, we estimate the likelihood that a bidder with credit ratings participates in an M&A deal. The likelihood increases when an investment bank assists the target firm in the negotiations and with the bidder's debt level. Else, it decreases with the deal ratio and the bidder's market-to-book ratio.

To test the effect of credit ratings on the premium paid by bidders in M&As, we run the following multiple regression:

$$\begin{aligned}
 PREM_i = & \beta_0 + \beta_1 TGTRATED_i + \beta_2 ACQRATED_i + \beta_3 DEALRATIO_i + \beta_4 ACQIB_i \\
 & + \beta_5 CASH_i + \beta_6 RELATED_i + \beta_7 COMPETING_i + \beta_8 HOSTILE_i \\
 & + \beta_9 TGTHITECH_i + \beta_{10} MKBK_i + \beta_{11} DEBT_i + \beta_{12} OCF_i \\
 & + \beta_{13} INDPREM_i + \beta_{14} INVMILLS_i + \epsilon_i
 \end{aligned} \tag{2}$$

where *PREM* represents the M&A premium paid by the bidder measured by *Premium4Week*. *ACQRATED* and *TGTRATED* are dummy variables representing bidders and targets with credit ratings, respectively. We expect the coefficients of both *ACQRATED* and *TGTRATED* to be negative (consistent with hypotheses 1 and 3), which would reflect the lower premiums paid when these parties transact while controlling for other characteristics. *COMPETING* and

HOSTILE are dummy variables representing bids received from multiple buyers and hostile bids, respectively. *OCF* is the ratio of operating income before depreciation-to-total assets minus the corresponding industry median ratio. *INDPREM* is the premium paid for similar deals (i.e., in the same industry) over the last 12 months preceding the announcement. The remainder variables are as explained before. The selection of the control variables follows previous studies related to the determinants of M&A premium (Walkling & Edmister, 1985; Kaufman, 1988; Lang *et al.*, 1989; Servaes, 1991; Palia, 1993; Cotter & Zenner, 1994; Schwert, 2000; Flanagan & O'Shaughnessy, 2003; Madura & Ngo, 2008; Jory, Madura & Ngo, 2012; Jory & Ngo, 2011, 2014 & 2015).

We present the results of the M&A premium multivariate regressions in Table 5. The dependent variable is *Premium4Week*. Our variables of interest are the dummy variables *TGTRATED* and *ACQRATED*, which represent targets and bidders with bonds rated by at least one of the three CRAs prior to the M&A announcement, respectively. We expect the coefficients of these two dummy variables to be negative, which would reflect the lower premiums paid when these parties transact while controlling for other characteristics. Consistent with our univariate findings and hypotheses 1 and 3, we find the coefficients of both variables to be negative and highly significant. The results on the control variables are also consistent with prior studies. The M&A premium paid is higher in deals financed only by cash, in competing bids, in hostile bids, and in acquisitions of high-tech targets. There is a momentum effect in M&A premiums paid as the dependent variable is positively linked to the level of premium paid in the industry in the previous year. M&A premium, on the other hand, is lower in larger deals, deals in which investment bank advisory services are sought, strategic acquisitions, and targets with a high level of debt.

[INSERT TABLE 5 ABOUT HERE]

5.4. Bidders' Operating Performance

Earlier we explained how in the world with perfect information asymmetry bad targets will crowd the marketplace and will adversely affect the performance of bidders. Thus, in a market with both good and bad targets, which is supported by the presence of credit ratings, bidders can do no worse. In this section, we test whether the presence of credit ratings is indeed associated with superior bidder operating performance.

We measure bidder operating performance using return on assets (ROA) and the ratio of operating income before depreciation-to-total assets (OCF). Both are industry-adjusted by subtracting the corresponding industry median figure and represent the average of the three years post-M&A announcement. We present our findings in Table 6. In Panel A, we compare M&A deals based on target credit ratings, i.e., rated versus nonrated. Consistent with hypothesis 2, bidders' performance using either measure is significantly above when the target is rated as opposed to nonrated (i.e., 1.37% versus -1.20% using ROA and 8.67% versus -5.86% using OCF). In Panel B, we compare deals based on bidders' ratings, i.e., rated versus nonrated. Once again, the ROA and OCF of deals with rated as opposed to nonrated bidders are superior (i.e., 1.68% versus -1.46% using ROA and 8.47% versus -7.10% using OCF). In Panel C, we find that the mean measures of operating performance are higher in transactions where both parties are rated when compared to transactions where both parties are nonrated. Mean ROA and OCF are higher by 4.09% and 15.76%, respectively.⁷

[INSERT TABLE 6 ABOUT HERE]

5.5 Further Analyses

5.5.1. Alternative Measures of Information Asymmetry

⁷ In undocumented findings, the acquisitions of rated targets yield better long-run stock performance than the acquisitions of nonrated targets.

We explore alternative measures of information asymmetry, such as analysts' coverage, dispersion of analyst forecasts, idiosyncratic risk, tangibility of assets and research and development (R&D) intensity. If information asymmetry drives the main result, then it should hold replacing ratings with the above measures of asymmetry.

We repeat the regressions of M&A Premiums using the five alternative proxies for information asymmetry as follows: *ANALYST* represents the number of analysts following the target firm. The data is obtained from I/B/E/S. *DISPERSION* is the standard deviation of the analyst recommendations in the analyst consensus file reported monthly in I/B/E/S. We use the latest data in the year preceding the M&A announcement. *RISK* is the standard deviation of the residuals from the Fama-French (1992, 1993) regressions. We use daily data over the interval (-252, -30) about the M&A announcement date. *INTANG* is the ratio of the target firm's intangible assets-to-total assets. The more intangible assets a firm relies upon, the less precise is its valuation compared to a firm with more tangible assets. *R&D* is the ratio of the target firm's research and development expenditure-to-total assets. R&D expenditure is a major contributor to information asymmetry (Aboody and Lev, 2000). Missing values of *INTANG* and *R&D* are set to zero. Given that M&A premium is a direct function of information asymmetry, we expect *Premium4Week* to be inversely related to *ANALYST* and positively related to each of *DISPERSION*, *RISK*, *INTANG*, and *R&D*. We present our findings in Table 7.

[INSERT TABLE 7 ABOUT HERE]

As expected, the coefficients of the variables *ANALYST* (Models 1 and 6), *RISK* (Models 3, and 8) and *R&D* (Models 5 and 10) are statistically significant and of the correct sign. *DISPERSION* and *INTANG* are not related to M&A premium since their respective

coefficient is not statistically significant. Thus, our findings based on target ratings are generally consistent with information asymmetry.

5.5.2. *Types of Targets Acquired by Rated Bidders*

Earlier we hypothesized that the M&A premiums are lower because bidders are concerned that if they overpay they may end up worsening their credit ratings. In this section, we test that in an attempt to preserve their ratings, bidders tend to favour less risky targets, i.e., mature companies with lower volatility of cash flows.

We consider the following two variables. The first measure is the age of the target firm, which we proxy using the number of years the target firm has data in the COMPUSTAT database. The second measure is the standard deviation of the target's *OCF* (i.e., the ratio of operating income before depreciation-to-total assets). We calculate the standard deviation using ten years of data ending a year prior to the acquisition date. All firms should have a minimum of five years of data. We present our findings in Panel A of Table 8.

[INSERT TABLE 8 ABOUT HERE]

Consistent with our prediction, the average age of the targets of rated bidders is 13 years compared to 10 years when bidders are not rated. The difference is statistically significant at the 1% level. The difference in *OCF* volatility between targets of rated bidders and targets of non-rated bidders is not statistically significant. Thus, using *AGE* as a measure of mature and safe companies, rated acquirers tend to target more mature companies.

5.5.3. *The Methods of Payment*

To the extent that rated companies exhibit less information asymmetry, we test whether such bidders have better access to funding. To that end, we compare the methods of payment between rated bidders and non-rated ones. If rated bidders have better access to

finance, then we should observe a higher percentage of cash used as their method of payment. Correspondingly, we should observe a higher percentage of stock payment used by nonrated bidders. We present our findings in Panel A of Table 8.

Both the mean and median ratios of cash payment-to-deal value are higher for the group of rated bidders compared to nonrated ones by 7.61% and 31.66%, respectively. The differences in mean and median figures are significant at the 1% level. These findings suggest that rated bidders have better access to cash resources and are therefore able to pay a higher proportion of the deal value in cash. Conversely, nonrated bidders favour payments with stock. The mean and median ratios of the percentage of the deal value paid in stock are higher for the group of nonrated bidders by 10.02% and 25.32%, respectively. Both differences are significant at the 1% level.

To test the hypothesis that rated firms have better access to external funds, we also analyse bidders' debt ratios. We present two versions of the debt ratio, i.e., raw and industry-adjusted (whereby the median at the two-digit SIC level is subtracted from the raw figure). Both ratios are higher for the group of rated bidders compared to non-rated bidders, supporting the proposition that the rated bidders have better access to external funds.

5.6. Why investors would be willing to accept a lower premium when the bidder is rated?

All things being equal, the value of a rated bidder exceeds the value of a nonrated bidder by the premium that investors place on ratings to counterbalance information asymmetry. Target shareholders who are paid in stock will benefit from the premium that accompanies rated bidders' stock. Therefore, target shareholders may settle for a lower M&A premium when paid in shares of a rated bidder's stock since the shares they receive already include the surplus attributable to credit ratings and lower information asymmetry. To test this proposition, we run the regression of M&A premiums separately on the subsamples of

stock and cash deals, and we present our findings in Panel B of Table 8. We expect to find an inverse relationship between M&A premium and rated bidders in stock deals but not necessarily in cash deals. Consistent with our hypothesis, the coefficient of the variable *ACQRATED* is negative and significant in stock deals (Panel B1) but not statistically significant in cash deals (Panel B2). The results suggest that targets settle for a lower M&A premium in stock deals by rated bidder firms.

6. Conclusion

We show that the presence of credit ratings significantly affects the prices paid in M&A transactions. Bidders end up paying lower premiums when either or both parties to an M&A transaction have outstanding bonds that are rated by one of the three leading rating agencies, i.e., Standard & Poor's, Moody's Investors Service and Fitch Ratings. Premium is defined as the difference between the offer price and the market price of target shares.

It is the presence of ratings rather than the rating quality that affects the M&A premium paid. Bidders are more likely to select rated targets in large deals and when the target is highly indebted.

Information asymmetry limits the quality of targets available for sale while credit ratings help reduce this disparity. Similar to the benefits brought about by warranties, branding, and licensing in other markets, ratings widen market participation and add value in the M&A market.

Reference

- Aboody, A., Lev, B., 2000. Information Asymmetry, R&D, and Insider Gains. *Journal of Finance* 55, 2747-2766.
- Akerlof, G.A., 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *Journal of Finance* 84, 488-500
- An, H.H., Chan, K.C., 2008. Credit ratings and IPO pricing. *Journal of Corporate Finance* 14, 584-595
- Bank for International Settlements, 2005. The Roles of Ratings in Structured Finance: Issues and Implications. Bank for International Settlements
- Becker, B., Milbourn, T., 2011. How did increased competition affect credit ratings? *Journal of Financial Economics* 101, 493-514
- Boot, A.W., Milbourn, T.T., Schmeits, A., 2006. Credit ratings as coordination mechanisms. *Review of Financial Studies* 19, 81-118
- Bosch, O., Steffen, S., 2011. On syndicate composition, corporate structure and the certification effect of credit ratings. *Journal of Banking & Finance* 35, 290-299
- Carron, A., Dhrymes, P.J., Beloreshki, T.N., 2003. Credit Ratings for Structured Products- A Review of Analytical Methodologies, Credit Assessment Accuracy, and Issuer Selectivity among the Credit Rating Agencies. NERA Economic Consulting
- Chou, T.-K., Cheng, J.-C., 2012. Credit ratings and excess value of diversification. *Journal of Empirical Finance* 19, 266-281
- Coffee Jr, J.C., 2006. Gatekeepers: The Professions and Corporate Governance: The Professions and Corporate Governance. Oxford University Press.
- Cotter, J.F., Zenner, M., 1994. How managerial wealth affects the tender offer process. *Journal of Financial Economics* 35, 63-97
- Covitz, D.M., Harrison, P., 2003. Testing Conflicts of Interest at Bond Ratings Agencies with Market Anticipation: Evidence that Reputation Incentives Dominate. In: *Finance and Economics Discussion Series 2003-68 (U.S.)* BoGotFRS (Ed.)
- Deb, P., Manning, M., Murphy, G., Penalver, A., Toth, A., 2011. Whither the credit ratings industry? Bank of England Financial Stability Paper
- Ederington, L.H., Goh, J.C., 1998. Bond rating agencies and stock analysts: who knows what when? *Journal of Financial and Quantitative Analysis* 33, 569-585
- Ederington, L.H., Yawitz, J.B., 1985. The bond rating process. Washington University. Institute of Banking and Financial Markets.

- Fama, E. F., & French, K. R. (1992). The cross - section of expected stock returns. the *Journal of Finance*, 47(2), 427-465.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 33(1), 3-56.
- Flanagan, D.J., O'Shaughnessy, K.C., 2003. Core-related acquisitions, multiple bidders and tender offer premiums. *Journal of Business Research* 56, 573-585
- Fulghieri, P., Strobl, G., Xia, H., 2014. The economics of solicited and unsolicited credit ratings. *Review of Financial Studies* 27, 484-518
- Gropp, R., Hirsch, C., Krahen, J., 2011. Is Rated Debt Arm's Length? Evidence from Mergers and Acquisitions, Working Paper. SSRN-eLibrary
- Hand, J.R., Holthausen, R.W., Leftwich, R.W., 1992. The effect of bond rating agency announcements on bond and stock prices. *The Journal of Finance* 47, 733-752
- He, Y., Wang, J., Wei, K., 2011. Do bond rating changes affect the information asymmetry of stock trading? *Journal of Empirical Finance* 18, 103-116
- Jory, S. R., Madura, J., & Ngo, T. N. (2012). Deal structure decision in the global market for divested assets. *International Review of Financial Analysis*, 24, 104-116.
- Jory, S. R., & Ngo, T. N. (2011). The wealth effects of acquiring foreign government-owned corporations: evidence from US-listed acquirers in cross-border mergers and acquisitions. *Applied Financial Economics*, 21(24), 1859-1872.
- Jory, S. R., & Ngo, T. N. (2014). Cross-border acquisitions of state-owned enterprises. *Journal of International Business Studies*, 45(9), 1096-1114.
- Jory, S. R., & Ngo, T. N. (2015). The wealth effects of acquiring foreign divested assets. *International Business Review*, 24(2), 235-245.
- Karampatsas, N., Petmezas, D., Travlos, N.G., 2014. Credit ratings and the choice of payment method in mergers and acquisitions. *Journal of Corporate Finance* 25, 474-493
- Kaufman, D.J., 1988. Factors Affecting the Magnitude of Premiums Paid to Target - Firm Shareholders in Corporate Acquisitions. *Financial Review* 23, 465-482
- Kiff, J., Nowak, S.B., Schumacher, L., 2012. Are Rating Agencies Powerful? An Investigation into the Impact and Accuracy of Sovereign Ratings International Monetary Fund.
- Kisgen, D.J., 2006. Credit ratings and capital structure. *The Journal of Finance* 61, 1035-1072

- Kisgen, D.J., 2009. Do firms target credit ratings or leverage levels? *Journal of Financial and Quantitative Analysis* 44, 1323-1344
- Lang, L.H., Stulz, R., Walkling, R.A., 1989. Managerial performance, Tobin's Q, and the gains from successful tender offers. *Journal of financial Economics* 24, 137-154
- Liu, Y., Malatesta, P.H., 2006. Credit ratings and the pricing of seasoned equity offerings. Unpublished working paper (University of Washington)
- Madura, J., Ngo, T., 2008. Clustered synergies in the takeover market. *Journal of Financial Research* 31, 333-356
- Odders-White, E.R., Ready, M.J., 2006. Credit ratings and stock liquidity. *Review of Financial Studies* 19, 119-157
- Opp, C., Opp, M., Harris, M., 2010. Rating agencies in the face of regulation: Rating inflation and regulatory arbitrage. SSRN eLibrary
- Palia, D., 1993. The managerial, regulatory, and financial determinants of bank merger premiums. *The Journal of Industrial Economics*, 91-102
- Partnoy, F., 1999. Siskel and Ebert of Financial Markets: Two Thumbs Down for the Credit rating Agencies, *The Washington University Law Quarterly* 77, 619
- Realdon, M., 2013. Credit risk, valuation and fundamental analysis. *International Review of Financial Analysis* 27, 77-90
- Rousseau, S., 2012. A Question of Credibility: Enhancing the Accountability and Effectiveness of Credit Rating Agencies. CD Howe Institute.
- S&P, 2012. The Role Of Credit Ratings In The Financial System URL <http://www.standardandpoors.com/ratings/articles/en/us/?articleType=HTML&assetID=1245333790527>
- Schwarcz, S., 2002. Private Ordering of Public Markets: The Rating Agency Paradox. *University of Illinois Law Review* 2002
- Schwert, G.W., 1996. Markup pricing in mergers and acquisitions. *Journal of Financial economics* 41, 153-192
- Schwert, G.W., 2000. Hostility in takeovers: in the eyes of the beholder? *The Journal of Finance* 55, 2599-2640
- Servaes, H., 1991. Tobin's Q and the gains from takeovers. *The Journal of Finance* 46, 409-419
- Walkling, R.A., Edmister, R.O., 1985. Determinants of tender offer premiums. *Financial Analysts Journal*, 27-37
- White, L.J., 2002. *The credit rating industry: An industrial organization analysis*. Springer.

Yi, H.C., Mullineaux, D.J., 2006. The informational role of bank loan ratings. *Journal of Financial Research* 29, 481-501

Credit Ratings and the Premiums Paid in Mergers and Acquisitions

Abstract

We examine the contribution of credit ratings in the information set that bidders use to price targets. Using a sample that includes U.S. domestic deals completed between 1986 and 2012, we find that the presence of ratings significantly affects the M&A premiums paid in mergers and acquisitions (M&As). M&A premiums paid are lower in deals involving rated as opposed to nonrated firms. Assuming that the presence of ratings mitigates the problem of information asymmetry and allows bidders to pay a fair price for a target, then the post-M&A performance of bidders of rated targets would be superior. Indeed, we find that the presence of ratings and bidders' post-M&A operating performance are positively related.

JEL Classification: G14; G24; G34

Keywords: Credit Ratings, Mergers and Acquisitions, Premiums

Table 1- Sample Distribution

<i>Panel A - Distribution by Deal Characteristics</i>			<i>Panel B - Distribution of Deal Characteristics</i>		
Year	N	Percent	Characteristics	N	Percent
1986	48	2.07	Related Target (<i>RELATED</i>)	1,581	68.12
1987	42	1.81	Hostile (<i>HOSTILE</i>)	36	1.55
1988	43	1.85	Competing (<i>COMPETING</i>)	107	4.61
1989	32	1.38	Cash Only (<i>CASH</i>)	721	31.06
1990	24	1.03	High-Tech Bidder (<i>ACQHITECH</i>)	1,053	45.37
1991	20	0.86	High-Tech Target (<i>TGTHITECH</i>)	947	40.80
1992	25	1.08	Bidder uses Investment Bank (<i>ACQIB</i>)	1,832	78.93
1993	41	1.77	Target uses Investment Bank (<i>TGTIB</i>)	2,214	95.39
1994	51	2.20			
1995	120	5.17	<i>Panel C - Distribution by Credit Ratings Prior to the Mergers</i>		
1996	124	5.34		N	Percent
1997	191	8.23	Target Moody Credit Rating Before the Deal	219	9.44
1998	184	7.93	Bidder Moody Credit Rating Before the Deal	684	29.47
1999	203	8.75	Target Standard Poor Credit Rating Before the Deal	225	9.69
2000	161	6.94	Bidder Standard Poor Credit Rating Before the Deal	687	29.60
2001	142	6.12	Target Fitch Credit Rating Before the Deal	197	8.49
2002	65	2.80	Bidder Fitch Credit Rating Before the Deal	646	27.83
2003	102	4.39	Target Credit Rating Before the Deal		
2004	99	4.27	(either Fitch, Moody or S&P)	236	10.17
2005	94	4.05	Bidder Credit Rating Before the Deal		
2006	112	4.83	(either Fitch, Moody or S&P)	713	30.72
2007	105	4.52	Target Investment Grade Bonds	119	50.42
2008	57	2.46	Bidder Investment Grade Bonds	531	74.47
2009	57	2.46	Target Has Higher Rating than Bidder	26	25.74
2010	68	2.93			
2011	45	1.94			
2012	66	2.84			
Total	2,321	100.00			

We download all U.S. domestic mergers and acquisitions from 1986 to 2012 from the THOMSON ONE Deals database. Both bidders and targets are publicly-listed either on the NYSE, AMEX or NASDAQ and have data available from CRSP and COMPUSTAT. Our final sample size consists of 2,321 M&A deals. Firm ratings data are downloaded from the Bloomberg database. *RELATED* refers to bids where the bidder and the target share the same two-digit SIC codes.

Table 2 - Sample Descriptive Statistics

	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>Stdev</i>
Deal Value	2,321	1,416.440	253.745	4,952.810
Enterprise Value	2,311	2,114.630	366.726	8,641.220
Measures Of M&A Premium				
- <i>Premium4Week</i>	2,316	44.481	37.605	40.144
- <i>Premium1Day</i>	2,321	33.191	28.470	22.161
- Deal Value / Enterprise Value	2,293	0.670	0.692	0.578
% Shares Acquired	2,321	98.843	100.000	6.874
% Cash Payment	2,321	41.592	21.098	44.703
% Stock Payment	2,321	50.188	53.450	45.243
Target Total Assets	2,308	2,008.640	274.592	11,738.500
Bidder Total Asset	2,287	19,735.860	2,595.790	87,533.940
Target Market Capitalization	2,321	929.623	153.549	3,495.900
Bidder Market Capitalization	2,321	13,366.960	1,866.950	35,900.130
Deal Value / Bidder Market Capitalization	2,321	0.400	0.181	0.893

Enterprise value is calculated by multiplying the number of shares outstanding (from the most recent balance sheet released prior to the announcement of the transaction) with the offer price and then adding the cost of convertible securities, short-term debt, straight debt, and preferred stock minus cash and marketable securities, all stated in \$ millions. *Premium 4 Week* is defined as the excess of the offer price over the target stock price four weeks prior to the M&A announcement (expressed in percentage). *Premium 1 Day* is defined as the excess of the offer price over the target stock price one day prior to the M&A announcement (expressed in percentage). Stdev stands for standard deviation.

Table 3 – The Effects of Bond Ratings on Premium***Panel A - Comparing Premiums Based on the Presence or Absence of Bond Ratings***

<u>The Effects of Target Ratings</u>					
	Targets without ratings	Targets with ratings	Difference	t-stat	Wilcoxon
Premium4Week	45.378	36.535	-8.843	-4.67***	-3.86***
Premium1Day	33.551	30.013	-3.538	-2.54***	-2.11**
Deal value/Enterprise value	1.024	0.854	-0.171	-2.29**	-1.68*
<u>The Effects of Bidder Ratings</u>					
	Bidders without ratings	Bidders with ratings	Difference	t-stat	Wilcoxon
Premium4Week	46.077	40.891	-5.186	-3.27***	-3.40***
Premium1Day	33.854	31.698	-2.156	-2.19**	-2.37**
Deal value/Enterprise value	1.002	1.019	0.018	0.19	0.27
<u>The Effects of Target and Bidder Ratings</u>					
	Targets & Bidders without ratings	Targets Rated & Bidders nonrated	Difference	t-stat	Wilcoxon
Premium4Week	46.685	36.207	-10.478	3.89***	2.88***
Premium1Day	34.278	27.025	-7.253	3.61***	2.96***
Deal value/Enterprise value	1.011	0.85	-0.161	1.93*	0.44
	Bidders with ratings & Targets without ratings	Bidders & Targets with ratings	Difference	t-stat	Wilcoxon
Premium4Week	41.921	36.75	-5.171	1.99**	1.76*
Premium1Day	31.625	31.991	0.366	-0.19	0.41
Deal value/Enterprise value	1.06	0.856	-0.204	-1.23	2.90***
<i>Panel B – Comparing Premiums based on Ratings Quality</i>					
<u>The Effects of Target Ratings</u>					
	Target bond rating is lower than investment grade	Target bond rating is investment grade	Difference	t-stat	Wilcoxon
Premium4Week	35.461	37.6	2.139	0.64	1.11
<u>The Effects of Bidder Ratings</u>					
	Bidder bond rating is lower than investment grade	Bidder bond rating is investment grade	Difference	t-stat	Wilcoxon
Premium4Week	41.285	40.756	-0.529	-0.2	-0.62
<u>The Effects of Ratings Differences Between Bidders and Targets</u>					
	Target bond rating is lower than bidder's	Target bond rating is higher than bidder's	Difference	t-stat	Wilcoxon
Premium4Week	35.375	36.293	0.917	0.16	0.26

Ratings data are obtained from the Bloomberg database. *Premium4Week* and *Premium1Day* are the excess of the offer price over the target stock price four weeks and 1 day, respectively, prior to the M&A announcement (expressed in percentage). Enterprise value is calculated by multiplying the number of shares outstanding (from the most recent balance sheet released prior to the announcement of the transaction) with the offer price and then adding the cost of convertible securities, short-term debt, straight debt, and preferred stock minus cash and marketable securities, all stated in \$ millions. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.

Table 4 - Probit Regressions

	<i>Model 1</i>		<i>Model 2</i>	
	<i>Dep. Var. = Target Rated</i>		<i>Dep. Var. = Bidder Rated</i>	
	<i>Param. Est.</i>	<i>Z-stat</i>	<i>Param. Est.</i>	<i>Z-stat</i>
<i>Intercept</i>	-0.475	-9.531***	-0.575	-5.751***
<i>DEALRATIO</i>	0.533	2.682***	-1.32	-2.823***
<i>ACQIB</i>	2.159	2.700***	-0.098	-0.466
<i>TGTIB</i>			0.687	2.179**
<i>CASH</i>	-0.895	-1.438	-0.141	-0.677
<i>RELATED</i>	1.252	2.047**	-0.263	-1.316
<i>TGTHITECH</i>	-0.765	-1.398	-0.082	-0.408
<i>TGTMKBB</i>	-0.185	-0.763		
<i>TGTDEBT</i>	2.819	5.888***		
<i>ACQMKBK</i>			-0.786	-1.793*
<i>ACQDEBT</i>			1.398	6.955***
Chi squared	52.05		70.92	
Pseudo R-squared	0.0827		0.0412	
Observations	2,214		2,321	
% correct classification	95.66%		88.11%	

The dependent variable takes a value of 1 in M&As where either party carries a credit rating, else it takes a value of zero; the independent variables are: the deal ratio (DEALRATIO), which is the ratio of the deal value-to-bidder market capitalization; dummy variables representing deals when the bidder hires the services of an investment bank to advise on the deal (ACQIB), the target uses an investment bank (TGTIB), cash-only bids (CASH), bids where the bidder and the target share the same two-digit SIC codes (RELATED), and high-tech targets (TGTHITECH). We also use the following control variables: industry-adjusted market-to-book (MKBB) and debt ratios (DEBT). The corresponding average for the industry—based on the two-digit SIC codes—is subtracted from the raw figure to obtain the industry-adjusted figure. TGT and ACQ represent target and bidder, respectively. Dep. Var. stands for dependent variable and Param. Est. stands for Parameter Estimates. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.

Table 5 – Regressions of M&A Premiums

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
	<i>Param.</i>		<i>Param.</i>		<i>Param.</i>	
	<i>Est.</i>	<i>t-stat</i>	<i>Est.</i>	<i>t-stat</i>	<i>Est.</i>	<i>t-stat</i>
<i>Intercept</i>	1.742	2.812***	0.205	0.16	1.962	1.789*
<i>TGTRATED</i>	-0.029	-2.624***			-0.029	-2.588***
<i>ACQRATED</i>			-0.038	-2.934***	-0.04	-2.963***
<i>DEALRATIO</i>	-0.102	-2.998***	0.047	0.113	-0.013	-0.031
<i>ACQIB</i>	-0.438	-3.120***	-0.064	-1.811*	-0.437	-3.083***
<i>CASH</i>	0.171	2.841***	0.021	0.416	0.183	2.361**
<i>RELATED</i>	-0.197	-2.427**	0.027	0.317	-0.184	-1.579
<i>COMPETING</i>	0.05	2.497**	0.046	2.438**	0.05	2.510**
<i>HOSTILE</i>	0.025	1.883*	0.026	2.029**	0.027	2.006**
<i>TGTHITECH</i>	0.174	3.345***	0.036	1.1	0.182	3.059***
<i>TGTMKKB</i>	0.019	1.221	-0.011	-1.124	0.019	1.231
<i>ACQMKBK</i>	-0.015	-1.917*	0.024	0.093	0.042	0.155
<i>TGTDEBT</i>	-0.42	-2.482**	0.043	2.424**	-0.426	-2.502**
<i>ACQDEBT</i>	0.002	0.138	-0.056	-0.135	-0.084	-0.196
<i>TGTOCF</i>	-0.014	-1.395	-0.012	-1.224	-0.014	-1.398
<i>ACQOCF</i>	-0.018	-1.456	-0.015	-1.181	-0.018	-1.437
<i>INDPREM</i>	0.435	9.318***	0.457	10.364***	0.433	9.294***
<i>INVMILLS (MODEL 2 TABLE 6)</i>			-0.092	-0.152	-0.128	-0.217
<i>INVMILLS (MODEL 1 TABLE 6)</i>	-0.724	-2.755***			-0.733	-2.776***
F stat	16.95		17.51		16.23	
R-squared	0.226		0.241		0.227	
Observations	2,207		2,313		2,207	
Year fixed effects	Yes		Yes		Yes	

PREM represents the M&A premium paid by the bidder measured by *Premium4Week*. TGTRATED and ACQRATED represent targets and bidders with bonds that are rated, respectively. COMPETING and HOSTILE are dummy variables representing bids received from multiple buyers and hostile bids, respectively. OCF is the ratio of operating income before depreciation-to-total asset minus the corresponding industry ratio. INDPREM is the premium paid in similar deals (i.e., in the same industry) over the last 12 months preceding the announcement. INVMILLS is the inverse Mills ratio obtained from Table 6. The remainder variables are as explained in Table 6. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.

Table 6 — The Relationship between Credit Ratings and Bidder Operating Performance Post-M&A

<i>Panel A – The Effects of Target Ratings</i>	ROA	OCF
Targets without ratings (N = 2,085)	-1.195%	-5.857%
Target with ratings (N=235)	1.366%	8.674%
Difference	2.561%	14.531%
t-stat / Wilcoxon	2.38**	1.86*
<hr/>		
<i>Panel B – The Effects of Bidder Ratings</i>		
Bidders without ratings (N=1,603)	-1.461%	-7.100%
Bidders with ratings (N = 713)	1.681%	8.470%
Difference	3.142%	15.570%
t-stat / Wilcoxon	3.86***	1.88*
<hr/>		
<i>Panel C – The Effects of Bidder & Target Ratings</i>		
Cases where bidders are nonrated		
Targets without ratings (N=1,510)	-1.571%	-7.763%
Targets with ratings (N = 93)	1.183%	8.782%
Difference	-2.754%	-16.545%
t-stat	-2.31**	-1.87*
Cases where bidders are rated		
Targets without ratings (N=571)	1.639%	8.493%
Targets with ratings (N=142)	2.521%	7.995%
Difference	-0.882%	0.499%
t-stat	-0.43	0.11
Cases where targets are nonrated		
Bidders without ratings (N=1,510)	-1.571%	-7.763%
Bidders with ratings (N = 571)	1.639%	8.493%
Difference	-3.210%	-16.257%
t-stat	-3.63***	-1.89*
Rated versus Nonrated		
Bidders and Targets are not rated (N=1,510)	-1.571%	-7.763%
Bidders and Targets are rated (N=142)	2.521%	7.995%
Difference	-4.092%	-15.758%
t-stat	-1.93*	-1.64

We measure bidders' operating performance using Return on Assets (ROA) and the ratio of operating income before depreciation-to-total assets (OCF). Both are industry-adjusted by subtracting the corresponding industry average and both represent the three-year average following the M&A announcement. We use the *t*-statistic to test for differences in mean values between groups. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.

Table 7 — Regressions of M&A Premiums based on Alternative Proxies of Information Asymmetry

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>
Intercept	0.923 (1.988*)	0.963 (2.087**)	0.596 (2.738***)	0.566 (2.525**)	0.573 (2.532**)	0.973 (2.043**)	1.010 (2.142**)	0.637 (2.944***)	0.614 (2.701***)	0.619 (2.722***)
ANALYST	-0.047 (-2.495**)					-0.038 (-2.311**)				
DISPERSION		-0.016 (-1.180)					-0.010 (-0.846)			
RISK			0.114 (6.293***)					0.108 (6.045***)		
INTANG				-0.031 (-1.872*)					-0.026 (-1.544)	
R&D					0.035 (3.557***)					0.029 (2.761***)
TGTRATED						-0.025 (-1.764*)	-0.030 (-1.833*)	-0.030 (-2.111**)	-0.036 (-2.452**)	-0.035 (-2.488**)
ACQRATED						-0.013 (-0.783)	-0.022 (-1.185)	-0.023 (-1.487)	-0.032 (-1.995*)	-0.032 (-1.959*)
DEALRATIO	-0.013 (-0.119)	-0.018 (-0.161)	0.015 (0.149)	-0.015 (-0.139)	-0.006 (-0.056)	-0.008 (-0.074)	-0.011 (-0.101)	0.020 (0.198)	-0.008 (-0.073)	0.000 (0.002)
ACQIB	-0.069 (-1.649)	-0.071 (-1.673*)	-0.051 (-1.678*)	-0.065 (-1.960*)	-0.066 (-1.938*)	-0.067 (-1.582)	-0.069 (-1.588)	-0.049 (-1.574)	-0.063 (-1.840*)	-0.063 (-1.810*)
CASH	0.229 (1.842*)	0.248 (2.043**)	0.166 (2.672***)	0.153 (2.666***)	0.151 (2.530**)	0.240 (1.879*)	0.256 (2.060**)	0.172 (2.787***)	0.159 (2.722***)	0.157 (2.624**)
RELATED	-0.056 (-0.785)	-0.065 (-0.935)	-0.039 (-1.115)	-0.043 (-1.180)	-0.040 (-1.042)	-0.061 (-0.843)	-0.068 (-0.985)	-0.043 (-1.228)	-0.047 (-1.298)	-0.044 (-1.159)
COMPETING	0.030 (1.696*)	0.030 (1.681*)	0.045 (2.378**)	0.044 (2.347**)	0.045 (2.407**)	0.032 (1.716*)	0.031 (1.706*)	0.047 (2.453**)	0.046 (2.440**)	0.047 (2.488**)
HOSTILE	0.024 (1.498)	0.022 (1.482)	0.027 (1.876*)	0.022 (1.638)	0.023 (1.684*)	0.026 (1.731*)	0.025 (1.752*)	0.031 (2.147**)	0.027 (2.001**)	0.028 (2.022**)
TGTHIGHTECH	0.159 (2.161**)	0.158 (2.184**)	0.085 (2.470**)	0.115 (2.995***)	0.093 (2.476**)	0.162 (2.181**)	0.161 (2.198**)	0.089 (2.719***)	0.118 (3.193***)	0.099 (2.807***)
TGTMKKB	-0.002 (-0.202)	-0.003 (-0.230)	-0.006 (-0.512)	-0.008 (-0.728)	-0.007 (-0.674)	-0.002 (-0.230)	-0.003 (-0.273)	-0.006 (-0.575)	-0.008 (-0.815)	-0.008 (-0.767)
ACQMKBK	0.089 (0.718)	0.076 (0.621)	0.046 (0.760)	0.028 (0.430)	0.033 (0.519)	0.091 (0.746)	0.080 (0.678)	0.050 (0.844)	0.034 (0.542)	0.038 (0.618)
TGTDEBT	-0.278 (-1.480)	-0.303 (-1.666)	-0.214 (-2.654**)	-0.185 (-2.331**)	-0.190 (-2.244**)	-0.292 (-1.511)	-0.311 (-1.669)	-0.220 (-2.691***)	-0.193 (-2.317**)	-0.196 (-2.250**)
ACQDEBT	-0.116 (-0.684)	-0.100 (-0.603)	-0.077 (-0.760)	-0.048 (-0.441)	-0.056 (-0.530)	-0.116 (-0.705)	-0.102 (-0.638)	-0.080 (-0.819)	-0.053 (-0.516)	-0.060 (-0.593)
TGTOCF	-0.012 (-1.470)	-0.013 (-1.380)	-0.005 (-0.609)	-0.011 (-1.214)	-0.009 (-1.226)	-0.012 (-1.478)	-0.013 (-1.418)	-0.006 (-0.651)	-0.011 (-1.235)	-0.010 (-1.259)
ACQOCF	-0.008 (-0.651)	-0.013 (-1.060)	-0.002 (-0.150)	-0.016 (-1.340)	-0.014 (-1.400)	-0.008 (-0.677)	-0.011 (-1.047)	-0.000 (-0.013)	-0.013 (-1.160)	-0.012 (-1.192)
INDPREM	0.474 (77.127***)	0.476 (75.052***)	0.495 (83.853***)	0.513 (139.83***)	0.511 (135.17***)	0.472 (77.815***)	0.473 (77.10***)	0.493 (75.50***)	0.509 (111.61***)	0.508 (107.43***)
INVMILLS 1 (Model 2 Table 6)	-0.478 (-1.716*)	-0.516 (-1.906*)	-0.353 (-3.002***)	-0.322 (-2.835***)	-0.321 (-2.702***)	-0.504 (-1.755*)	-0.537 (-1.926*)	-0.371 (-3.129***)	-0.343 (-2.885***)	-0.342 (-2.792***)
INVMILLS 2 (Model 1 Table 6)	-0.155 (-0.658)	-0.131 (-0.566)	-0.112 (-0.768)	-0.062 (-0.399)	-0.075 (-0.497)	-0.160 (-0.696)	-0.143 (-0.635)	-0.125 (-0.874)	-0.081 (-0.544)	-0.093 (-0.626)

F stat	124.87***	50.07***	429.02***	192.82***	284.30***	87.68***	75.03***	524.91***	216.88***	238.15***
R-squared	0.251	0.249	0.290	0.282	0.282	0.252	0.251	0.291	0.284	0.284
Observations	1,749	1,749	2,308	2,309	2,309	1,749	1,749	2,308	2,309	2,309
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The dependent variable is the M&A premium paid by the bidder measured by *Premium4Week*. ANALYST represents the number of analysts following the target firm. DISPERSION is the standard deviation of the analyst recommendations in the analyst consensus file reported monthly in I/B/E/S. RISK is the standard deviation of the residuals from the Fama-French (1992, 1993) regressions. INTANG is the ratio of the target firm's intangible assets-to-total assets. R&D is the ratio of the target firm's research and development expenditure-to-total asset. TGTRATED and ACQRATED represent targets and bidders with bonds that are rated, respectively. The remainder variables are as explained in Tables 6 and 7. *t*-stats are presented in parentheses. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.

Table 8 – Impact of Credit Ratings on Premium in Control for Firm Characteristics and Deal Characteristics**Panel A — Univariate Analyses based on Target's Age and OCF Volatility, Method of Payment and Bidder's Debt Ratio**

	<i>Rated bidders</i> (<i>N</i> = 712)		<i>Non-rated bidders</i> (<i>N</i> = 1,607)		<i>Difference</i>		<i>t-stat</i>	<i>Wilcoxon-stat</i>
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>		
<u>Comparison of Target Firm's Age and OCF Volatility</u>								
Target's Age	13.225	10.000	10.115	7.000	3.110	3.000	6.27***	5.87***
Target's OCF Volatility	0.059	0.030	0.059	0.031	0.000	-0.001	-0.01	-1.08
<u>Comparison of percent of deal value paid in cash and percent of deal value paid with stock</u>								
% Cash Payment	46.861	40.528	39.247	8.865	7.613	31.663	3.78***	3.78***
% Stock Payment	43.247	39.015	53.263	64.333	-10.016	-25.318	-5.02***	-5.11***
<u>Comparison of debt ratio between rated and nonrated bidders</u>								
Debt Ratio	0.650	0.627	0.567	0.551	0.083	0.077	8.10***	7.27***
Industry-Adj. Debt Ratio	0.093	0.055	-0.006	-0.002	0.099	0.058	12.61***	13.95***

Panel B – Regressions of M&A Premiums on the Subsamples of Stock and Cash Deals separately

	Panel B1: Stock Deals		Panel B2: Cash Deals	
	<i>Param. Est.</i>	<i>t-stat</i>	<i>Param. Est.</i>	<i>t-stat</i>
<i>Intercept</i>	0.845	(2.787 ***)	0.58	(2.310 **)
<i>TGTRATED</i>	-0.053	(-2.207 **)	-0.032	(-1.460)
<i>ACQRATED</i>	-0.083	(-3.497 ***)	-0.068	(-1.577)
<i>DEALRATIO</i>	-0.178	(-1.147)	0.190	(1.039)
<i>ACQIB</i>	-0.071	(-2.381 **)	-0.052	(-1.085)
<i>RELATED</i>	-0.137	(-2.247 **)	0.036	(0.921)
<i>COMPETING</i>	0.023	(0.874)	0.098	(2.906 ***)
<i>HOSTILE</i>	0.008	(0.444)	0.068	(2.499 **)
<i>TGTHITECH</i>	0.231	(3.920 ***)	0.096	(2.246 **)
<i>TGTMKKB</i>	-0.008	(-0.713)	-0.015	(-0.965)
<i>ACQMKBK</i>	-0.120	(-0.822)	0.026	(0.855)
<i>TGTDEBT</i>	-0.295	(-2.106 **)	0.074	(1.458)
<i>ACQDEBT</i>	0.081	(0.454)	-0.155	(-1.011)
<i>TGTOCF</i>	-0.079	(-7.440 ***)	0.022	(0.658)
<i>ACQOCF</i>	0.004	(0.167)	0.035	(2.458 **)
<i>INDPREM</i>	0.063	(1.589)	-0.024	(-1.322)
<i>INVMILLS (MODEL 2 TABLE 6)</i>	-0.361	(-2.137 **)	-0.010	(-0.163)
<i>INVMILLS (MODEL 1 TABLE 6)</i>	0.171	(0.643)	-0.246	(-1.201)
F-statistics	7.105		4.962	
Adj. R-squared	0.127		0.098	
Observations	1272		935	

Year fixed effects

Yes

Yes

In Panel A, *AGE* is the number of years the target firm has data in COMPUSTAT. OCF Volatility is the standard deviation of the target's OCF (i.e., the ratio of operating income before depreciation-to-total asset). % Cash Payment is the ratio of cash paid-to-deal value expressed in percent. % Stock Payment is the percentage of the deal value paid with the bidder's stock. Debt Ratio is the ratio of total debt-to-total assets. Industry-Adj. Debt Ratio is the firm's Debt Ratio minus the industry median (matched at the two-digit SIC code). We use the t-statistic and the non-parametric Wilcoxon-statistic to test for differences in mean and median values between groups, respectively. In Panel B, the dependent variable is the M&A premium paid by the bidder measured by *Premium4Week*. TGTRATED and ACQRATED represent targets and bidders with bonds that are rated, respectively. COMPETING and HOSTILE are dummy variables representing bids received from multiple buyers and hostile bids, respectively. OCF is the ratio of operating income before depreciation-to-total asset minus the corresponding industry ratio. INDPREM is the premium paid in similar deals (i.e., in the same industry) over the last 12 months preceding the announcement. The remainder variables are as explained in Table 4. ***, ** and * represent significance levels at 1%, 5% and 10%, respectively.