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Bond market access and investment ☆

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ABSTRACT

Prior research has shown that differential access to debt markets significantly affects capital structure. In this paper, we examine the effect of access to debt markets on investment decisions by using debt ratings to indicate bond market access. We find that rated firms are more likely to undertake acquisitions than nonrated firms. This finding remains even after accounting for firm characteristics, for the probability of being rated, and in matched sample analysis as well as in subsamples based on leverage, firm size, age and information opacity. Rated firms also pay higher premiums for their targets and receive less favorable market reaction to their acquisition announcements relative to non-rated firms. However, the average announcement returns to rated acquirers are non-negative. Collectively, these findings suggest that the lack of debt market access has a real effect on the ability to make investments as well as on the quality of these investments by creating underinvestment, instead of simply constraining overinvestment.

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1. Introduction

Faulkender and Petersen (2006) hypothesize and show that having access to public debt markets affects a firm's capital structure such that firms having access to public debt markets have 50% higher leverage ratios relative to those not having access. In doing so, they draw attention to the differences in the cost of public and private debt. These credit supply-side differences matter such that firms with similar demand for credit hold different amounts of debt in their capital structures. In this paper, we build on their

findings by asking how differential access to capital affects firms' investment decisions. By affecting investment decisions, public debt market access would then have a real value effect on firms.

A priori, it is not clear that differential debt market access would affect firms' investments. Firms without public debt access could shift to use equity financing instead, such that the source of funding effect is limited to the capital structure and does not affect investment policy. Absent such a shift, access to debt markets can influence investment decisions. Specifically, firms that exclusively borrow from private (informed) lenders (e.g., banks) can be rationed by the debt capacity of their lenders (Stiglitz and Weiss, 1981; Faulkender and Petersen, 2006). Therefore, constrained access to debt markets could lead to constrained investment, which manifests itself in fewer investments, but with the investments being more value-increasing and less costly (the financial constraints hypothesis).

However, an increase in debt access could come at a cost. Specifically, higher volume of dispersed, less-informed

investors could lead to less effective monitoring relative to concentrated informed lenders. Thus, firms that have access to public debt markets have larger borrowing capacity with more discretion on their investments. These collectively predict that firms with bond ratings are more likely to make investments that are likely to be value-decreasing (the free cash flow hypothesis). Overall, both the financing constraints and free cash flow hypotheses predict significant effects of access to debt markets on a firm's ability to undertake investment and on the quality of those investments.

In this study, we examine the effects of access to the public debt markets on real investment activity by examining large, visible investments: acquisitions. Specifically, we examine whether having a bond rating, which facilitates access to bond markets, influences the likelihood of undertaking an acquisition and the size of that acquisition. We also explore the effect of a bond rating on the premiums paid for the target firm. Finally, we study the extent to which debt market access has implications for value creation through acquisitions.

Following the Faulkender and Petersen (2006) finding that qualified firms without a bond rating are the exception, we assume that lack of a bond rating is a supply-side effect instead of indicating lack of demand for a rating. However, we also consider the endogeneity of becoming rated. Most notably, having a rating is related to a firm's size and leverage. In addition to controlling for these factors in our analyses, we take further steps to disentangle the effect on acquisition decisions of having a rating. First, we examine the subsample of firms that do not have a rating two years prior to the acquisition and study whether firms that obtain a rating subsequently have a higher likelihood of making an acquisition. Second, we replicate the acquisition decision analyses for the subsample of rated and nonrated firms matched by industry and size.[2] Third, we show that having a rating affects acquisition decisions even after controlling for the probability of being rated. Finally, we study the ability to make acquisitions across size, leverage, market-to-book, and age quartiles as well as for subsamples of information opacity. All of these analyses confirm bond market access' significant effects on acquisition decisions.

Specifically, we find that having a bond rating increases the likelihood of undertaking an acquisition by 4.6% (relative to a baseline of 11.2%) after controlling for market leverage and other determinants of making acquisitions. Thus, the source of funding does affect the ability to undertake investments. We also find that acquirers with bond ratings pay 5.5% higher premiums relative to nonrated acquirers. Consistent with the rated acquirers paying higher premiums, capital markets react more unfavorably to acquisition announcements by those acquirers. The announcement return is a sufficient statistic for the value implication as we find that there is also no long-run mean reversion in stock price for acquirers with a rating. On the contrary, in the long run, nonrated acquirers perform very similarly to those with a rating.

These results are consistent with optimal constraints, meaning that financial constraints due to capital access keep managers from overinvesting (the free cash flow hypothesis). However, they are also in line with suboptimal constraints, such that the constraints reduce a manager's ability to undertake all positive net present value investments (the financial constraints hypothesis). Under the latter hypothesis, financially constrained firms take only the highest NPV projects, so that their marginal project creates more value than the marginal project of unconstrained firms. In our final test, we attempt to disentangle the free cash flow and the financial constraints hypotheses. Although these two hypotheses both predict a difference in acquisition choices of rated firms relative to nonrated firms, the two hypotheses have different predictions for the sign of announcement returns. Specifically, the free cash flow hypothesis predicts that announcement returns to rated acquirers will be negative as these firms are more likely to make value-decreasing acquisitions that benefit managers personally. However, based on the full sample of public, private, and subsidiary targets, we do not find negative market reactions to rated acquirers on average either in the short or long run. Collectively, these findings suggest that the free cash flow hypothesis cannot explain the findings presented in this paper. We conclude that lack of public debt market access constrains firms to undertake only the best investments, rather than exhausting all positive NPV investments.

In additional robustness tests, we study whether the investment effect of a firm's access to debt markets is related to its degree of information opacity and life cycle. Specifically, firms that are informationally opaque are less likely to have a rating and are less likely to make an acquisition. Firms that are further into their life cycle are more likely to have a rating as they have a long track record. They are also more likely to make acquisitions due to low internal growth opportunities. We find a significant and positive effect of having a rating on the likelihood of making an acquisition for both subsamples of informationally opaque and nonopaque firms. The effect of having a rating persists for the subsample of older firms and most notably for the subsample of young firms. Collectively, these findings suggest that access to debt markets has a distinct effect on investment decisions.

Our paper fits into the broad literature examining the degree to which financial constraints cause underinvestment. Following the seminal work of Fazzari, Hubbard, and Petersen (1988), the majority of that literature examines differential access to internal cash flow, asking whether increased cash flows relax such constraints in an investment-cash flow sensitivity setting.[3] We examine

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[2] We obtain similar results when we match rated firms and nonrated firms by industry and market leverage.

[3] For example, Kaplan and Zingales (1997, 2000) argue that investment-cash flow sensitivities are in fact higher for financially unconstrained firms. Erickson and Whited (2000) also argue that measurement error generates spuriously high sensitivities for financially constrained firms. Furthermore, Gomes (2001) and Alti (2003) generate investment-cash flow sensitivities in a setting where financing is frictionless. These sensitivities are similar to the ones observed in the data, thereby suggesting that cash flow sensitivities do not fully capture the financial constraints. However, Moyen (2005) shows that the results of Fazzari et al. (1988) can be replicated in the presence of financial

whether differential access to external capital has effects beyond capital structure, potentially generating under- or overinvestment. In a related paper that also studies external financing, Sufi (2009) examines firms with a syndicated bank loan rating and finds more cash acquisitions for rated firms. In addition to examining the full spectrum of acquisitions (i.e., all cash, all stock, and hybrid acquisitions), we go further to understand the effect of a firm's rating on the quality of its investments and hence, the effect of the constraint imposed by differential access. In addition to finding a significant effect of having a debt rating on the ability to undertake an acquisition, this study suggests that access to debt markets influences the nature of a firm's investments.

Our study is also related to recent work by Maksimovic, Phillips, and Yang (2013) examining acquisitions by private and public firms inside and outside of merger waves. They find that public firms' acquisition activities are much more sensitive to financing conditions and conclude that private firms are so financially constrained that normal fluctuations in credit market conditions do not affect their ability to pursue acquisitions. Further, better-rated firms have the greatest sensitivity to changes in credit conditions. We study variation in public debt access within public firms and how that affects their ability to pursue investments, using acquisitions as our experimental setting.

This paper is also related to studies on the interdependence of financing and investment decisions. Specifically, Almazan, de Motta, Titman, and Uysal (2010) and Uysal (2011) show that excess leverage impairs a firm's ability to undertake acquisitions. We show that access to debt markets continues to play an important role even after controlling for leverage. Thus, this paper contributes to these studies by suggesting that overleveraged firms could still pursue acquisition opportunities if they have access to public debt markets.

Our results also contribute to the study of the interdependence of certification and corporate policies. Specifically, Stiglitz and Weiss (1981) argue that difficulty in verifying a firm's quality and its investment quality could impede its ability to raise capital for new projects. We contribute to this literature by showing that difficulty in verification of a firm's quality influences the average quality of its investment projects by constraining its ability to invest.

The paper is organized as follows. Section 2 provides details of sample selection and descriptive statistics of the data, Section 3 examines the empirical findings and Section 4 draws conclusions.

2. Sample selection and descriptive statistics

In our study, we use firms covered in Compustat and The Center for Research in Security prices (CRSP) from 1990 to 2011. Following previous studies (e.g., Hovakimian,

Table 1

Summary statistics.

The table reports descriptive statistics for the sample. There are 69,162 observations. Variable definitions are in the Appendix A.

Variable	Mean	Standard deviation	Minimum	Maximum
Total Assets ($ millions)	3,319	17,199	1	797,769
Sales [Ln(Sales in $ millions)]	5.549	1.898	2.303	12.574
Stock Return	0.166	0.693	− 0.847	3.476
Market-to-Book	1.777	1.259	0.603	8.980
EBITDA/Total Assets	0.126	0.151	− 0.466	0.744
Market Leverage	0.379	0.241	0.021	0.955
Cash/Total Assets	0.150	0.175	0	0.760
Rating Dummy	0.281	0.449	0	1
Acquisition	0.112	0.316	0	1
Firm Acquisition	0.052	0.222	0	1
Subsidiary Acquisition	0.071	0.256	0	1
All Acquisitions Value/TA	0.029	0.125	0	0.925
Firm Acquisitions Value/TA	0.015	0.082	0	0.654
Subsidiary Acquisitions Value/TA	0.010	0.050	0	0.374

Opler, and Titman, 2001; Fama and French, 2005; Flannery and Rangan, 2006), we exclude financial firms (6000–6999) and regulated utilities (4900–4999). We also drop firms with sales under $10 million in 1990 dollars. For each firm in the sample, we obtain all of its completed domestic acquisitions listed in the Securities Data Company (SDC) Mergers and Acquisitions (M&A) database as a merger, acquisition of majority interest, asset acquisition, or acquisition of certain assets with transaction values over $1 million. The acquisitions coded as asset acquisitions are typically subsidiaries, so we follow the majority of the prior literature and refer to them as subsidiaries in the rest of the text. We also follow Moeller, Schlingemann, and Stulz (2004) and drop acquisitions if the ratio of transaction value to total assets of the acquirer is less than 1%. After merging the M&A data with Compustat and CRSP data sets, we have 10,880 acquisitions that have non-missing dependent and independent variables. These acquisitions have an average transaction value of $486 million. Of these transactions, only 14.7% are all-stock offers, whereas 30.8% are all-cash offers and another 54.5% have a cash component. As most cash deals are financed with debt (Bharadwaj and Shivdasani, 2003; Harford, Klasa, and Walcott, 2009), these findings provide preliminary evidence on the importance of access to debt markets in financing acquisitions.

Table 1 reports the descriptive statistics of firms in the sample. The average total assets of firms in the sample is $3.3 billion. In our sample, 28.1% of the firms have a rating and the average market leverage is 0.379.[4] Table 1 also indicates that acquisitions play an important role: During the study period, 11.2% of firms make at least one acquisition and the average annual transaction volume constitutes 2.9% of total assets.

(*footnote continued*)
constraints. Furthermore, Almeida and Campello (2007) show that the tangibility of a firm's assets influences investment and cash flow sensitivities only for financially constrained firms, indicating that financial constraints influence corporate investments.

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[4] Variable definitions are in Appendix A.

Fraction of firms making any acquisition (all acquirers)

Fraction of firms acquiring another firm
(firm acquirers)

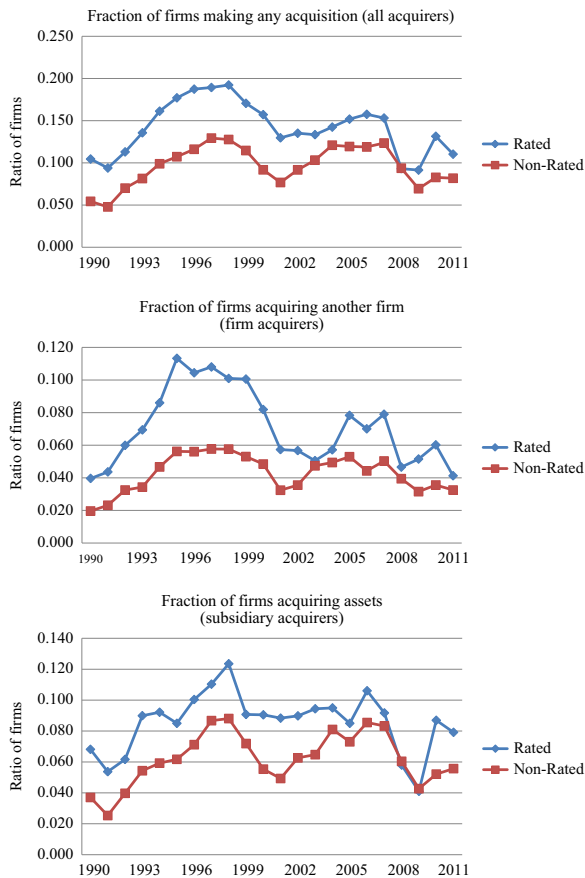Fraction of firms acquiring assets
(subsidiary acquirers)

Fig. 1. Ratio of acquirers by ratings, 1990-2011. The figure shows the incidence of *All Acquirers, Firm Acquirers and Subsidiary Acquirers* for rated and non-rated firms. The sample is based on 69,162 firm-years from COMPUSTAT between 1990 and 2011. *All Acquirers* is the proportion of firms that are listed as acquirers in acquisitions of majority interest, mergers, asset acquisitions or acquisitions of certain assets as defined in the Securities Data Company (SDC) Mergers & Acquisitions database. *Firm Acquirers* is the proportion of firms that are listed as acquirers in an acquisition of majority interest or in a merger as defined in the SDC-M&A database. *Subsidiary Acquirers* is the proportion of firms that are listed as acquirers in an subsidiary acquisition or in an acquisition of certain assets as defined in the SDC M&A database.

3. Empirical analyses

3.1. Ratings and likelihood of undertaking acquisitions

This subsection presents evidence that relates a firm's long-term debt rating to its acquisition activity. Fig. 1 shows the average incidence of *All Acquirers, Firm Acquirers,* and *Subsidiary Acquirers* over years from 1990 to 2011. While the differences in acquisition likelihoods of rated and nonrated firms fluctuate over time, firms with debt ratings have higher acquisition probabilities relative to nonrated firms in all three acquisition categories. Panel A of Table 2, which reports the mean values for acquisition variables for firm per year by debt ratings, also presents evidence of the impact of having a debt rating on acquisition choices. For example, the unconditional probability of acquiring a target is 14.2% for the subsample of firms with a rating, whereas it is only 10.0%

Table 2

Acquisition measures and debt ratings.

Panel A reports means of acquisition variables of 69,162 firm-years recorded in Compustat between 1990 and 2011. Panel B reports the ratio of acquirers sorted by rating and *Market Leverage* quartiles. Panel C reports the ratio of acquirers sorted by rating and *Sales* quartiles. Panel D reports the ratio of acquirers sorted by rating and *Market-to-Book* quartiles. Variable definitions are in Appendix A. ***, ** and * stand for statistical significance at the 1%, 5% and 10% levels, respectively.

	Whole sample	Rated	Non-rated	Rated – Non-rated
Panel A: Acquisition frequencies for rated and non-rated firms				
Acquirers	0.112	0.142	0.100	0.042***
Firm acquirers	0.052	0.071	0.045	0.026***
Subsidiary acquirers	0.071	0.087	0.065	0.022***
Within-Industry acquirers	0.059	0.076	0.053	0.023***
Cross-Industry acquirers	0.060	0.076	0.054	0.022***
Public acquirers	0.024	0.045	0.016	0.029***
Panel B: Frequencies of acquirers for market leverage quartiles				
Market leverage quartiles				
1 (Smallest)	0.146	0.200	0.140	0.060***
2	0.132	0.186	0.112	0.074***
3	0.110	0.155	0.085	0.070***
4 (Largest)	0.060	0.084	0.045	0.039***
Panel C: Frequencies of acquirers for sales quartiles				
Sales quartiles				
1 (Smallest)	0.068	0.153	0.067	0.086***
2	0.118	0.163	0.114	0.050***
3	0.138	0.159	0.129	0.030***
4 (Largest)	0.125	0.133	0.105	0.028***
Panel D: Frequencies of acquirers for market-to-book quartiles				
Market-to-book quartiles				
1 (Smallest)	0.057	0.070	0.053	0.017***
2	0.099	0.127	0.085	0.042***
3	0.139	0.178	0.120	0.058***
4 (Largest)	0.153	0.195	0.142	0.054***

for the non-rated firms. The difference is 4.2% ($p < 0.01$) and corresponds to 37.5% relative to the mean overall unconditional probability of being an acquirer (11.2%). The relation holds regardless of the type of acquisition: Firms with bond ratings are also more likely to acquire another firm (7.1% versus 4.5%) and to acquire subsidiaries (8.7% versus 6.5%) relative to non-rated firms. This relation continues to hold for within- (7.6% versus 5.3%) and cross-industry acquisitions (7.6% vs. 5.4%). Overall, these findings provide preliminary evidence supporting the view that access to debt markets enhances a firm's ability to undertake an acquisition.

Panel B of Table 2 reports the likelihood of undertaking an acquisition by *Rating* and *Market Leverage* quartiles. While the likelihood of undertaking an acquisition incrementally decreases with *Market Leverage*, firms with bond ratings have a higher probability of making an acquisition for each *Market Leverage* quartile. We continue to find higher acquisition frequencies for rated firms for all *Sales* quartiles in Panel C. Furthermore, Panel D shows that the results remain intact when we sort the data by market-to-book ratio. Collectively, these findings indicate that

Table 3

Rating and likelihood of undertaking an acquisition.

  The table presents marginal effects of probit analysis in odd-numbered models and marginal effects of tobit analysis in even-numbered models. The dependent variable in probit models takes the value of one if the firm undertakes an acquisition. In tobit analysis, the dependent variable is the ratio of the sum of acquisition value to the firm's total assets. Variable definitions are in Appendix A. The p-values are given in parentheses and are adjusted for standard errors clustered by firm and year. All models include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	All acquisitions		Firm acquisitions		Subsidiary acquisitions	
	(1)	(2)	(3)	(4)	(5)	(6)
Rating dummy	0.046***	0.014***	0.021***	0.006***	0.031***	0.005***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Sales	0.007***	0.001***	0.006***	0.002***	0.000	0.000
	(< 0.001)	(0.005)	(< 0.001)	(< 0.001)	(0.810)	(0.129)
Cash holdings/TA	0.029**	0.009**	0.031***	0.009***	−0.009	−0.001
	(0.029)	(0.020)	(< 0.001)	(< 0.001)	(0.302)	(0.344)
Market leverage	−0.138***	−0.039***	−0.067***	−0.019***	−0.086***	−0.013***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Stock return	0.019***	0.007***	0.010***	0.003***	0.013***	0.002***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Market-to-book	−0.004**	0.000	0.002	0.001**	−0.006***	−0.001***
	(0.039)	(0.604)	(0.123)	(0.013)	(< 0.001)	(< 0.001)
EBITDA/TA	0.124***	0.039***	0.041***	0.012***	0.093***	0.015***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Industry M&A liquidity	0.173***	0.053***	0.082***	0.023***	0.121***	0.019***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Herfindahl index	−0.067***	−0.020***	−0.036***	−0.011***	−0.037***	−0.006***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	69,162	69,162	69,162	69,162	69,162	69,162
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

leverage, firm size, and market-to-book ratio are unlikely to confound the effect of rating on the likelihood of undertaking an acquisition while also supporting our conjecture that access to debt markets influences acquisition decisions.

Next, we conduct a multivariate analysis including several factors that are not accounted for in the univariate analysis but could affect the likelihood of making an acquisition. Specifically, we add *EBITDA/TA* in our regressions, as better performing firms are more likely to undertake acquisitions (Roll, 1986; Harford, 1999). We also include the natural logarithm of sales to control for firm size as large firms are more likely to make acquisitions (Almazan, de Motta, Titman, and Uysal, 2010). Including a proxy for firm size also enables us to disentangle the effects of firm size and rating as large firms are more likely to have a rating and to undertake acquisitions. We also add *Market Leverage* in the regressions to separate the effects of leverage and having a rating. To account for potential effects of investment opportunities and misvaluation, we add *Stock Return* and *Market-to-Book* variables in multivariate analysis. Furthermore, the regressions include *Cash Holdings/TA*, as firms with large cash holdings are more likely to undertake acquisitions (Harford, 1999). Following Schlingemann, Stulz, and Walkling (2002), we also control for the liquidity of the market for corporate assets within an industry by including the *Industry M&A Liquidity* measure in our regressions. Industry concentration could also influence acquisition decisions. Firms in a highly

concentrated industry have fewer targets available for acquisitions within the industry, which could limit within-industry acquisitions, while enhancing the likelihood of cross-industry acquisitions. Therefore, the regressions include the *Herfindahl Index*. We also add year dummies in the analysis to account for macroeconomic changes in the time series.

Table 3 reports the probit analysis in odd-numbered models and the tobit analysis in even-numbered models. We report the marginal effects of the probit and tobit models at the mean values, as the coefficient estimates in these models are difficult to interpret. Following Petersen (2009), we estimate *p*-values in both probit and tobit models based on clustering by firm and time (year) to account for correlations among error terms within firm and within the year. Consistent with the evidence presented in the univariate analysis, both probit and tobit analyses show significant effects of rating on acquisition decisions. Specifically, firms with debt ratings are 4.6% more likely to make an acquisition, an increase of 41.1% over the sample average (Model 1). The positive and significant effect of *Rating* continues to hold for both firm (2.1%) and subsidiary acquisitions (3.1%) in Models 3 and 5, respectively. Having a rating also increases the size of acquisitions by 1.4%, an increase of 48.3% (Model 2). The positive and significant effect of *Rating* remains intact for both firm and subsidiary acquisitions in Models 4 and 6, respectively. The presence of these statistically and

Table 4
Rating and premiums paid to target firms.

The table reports regression estimates of the premium paid to target firms. The dependent variable in Model 1 is Target Premium estimated through cumulative abnormal returns to the target over the period covering one day before the announcement date to one day before the effective date of acquisition. The dependent variable in Model 2 is Target CAR($-1,+1$), three-day cumulative abnormal returns to the target from one day before and one day after the announcement date. Target CAR($-2,+2$), the five-day cumulative abnormal returns to the target from two days before to two days after the announcement date, is the dependent variable in Model 3. The p-values are based on standard errors corrected for heteroskedasticity and for clustering by firm. Variable definitions are in Appendix I. All models include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	Target premium	Target CAR ($-1,+1$)	Target CAR ($-2,+2$)
	(1)	(2)	(3)
Rating dummy	0.055*	0.028*	0.026
	(0.051)	(0.092)	(0.126)
Market leverage	−0.029	−0.075*	−0.095**
	(0.735)	(0.078)	(0.024)
Cash holdings/TA	0.030	0.005	0.001
	(0.697)	(0.910)	(0.982)
Sales	−0.013	0.007	0.008*
	(0.146)	(0.137)	(0.073)
Market-to-book	0.010	0.007	0.007
	(0.358)	(0.230)	(0.278)
EBITDA/TA	0.059	−0.010	−0.023
	(0.529)	(0.807)	(0.547)
Stock return	−0.075***	−0.006	−0.002
	(<0.001)	(0.544)	(0.857)
Within-industry acquisition	−0.013	0.005	0.005
	(0.554)	(0.665)	(0.683)
All cash	0.081***	0.110***	0.109***
	(0.001)	(<0.001)	(<0.001)
Competed	0.033	−0.039*	−0.049**
	(0.553)	(0.057)	(0.016)
Hostile	0.213***	0.124***	0.116***
	(0.002)	(0.005)	(0.007)
Industry M&A liquidity	−0.180	−0.109*	−0.069
	(0.140)	(0.084)	(0.294)
Herfindahl index	0.010	0.029	0.033
	(0.920)	(0.541)	(0.482)
Tangible assets/TA (target firm)	−0.140***	−0.107***	−0.111***
	(0.004)	(<0.001)	(<0.001)
Market-to-book (target firm)	−0.035***	−0.020***	−0.022***
	(<0.001)	(<0.001)	(<0.001)
Year fixed effects	Yes	Yes	Yes
Number of observations	1470	1470	1470
R-squared	0.066	0.107	0.107

economically significant results, even after controlling for firm characteristics such as acquirer *Sales, Market-to-Book* and *Market Leverage*, suggests that the influence of rating is not simply a reflection of firm size, misvaluation or leverage. Nonetheless, we examine this issue more carefully in Section 3.5. Collectively, these findings lend support to the assumption that firms mostly resort to capital markets in financing acquisitions, thus having access to debt markets plays an important role in their ability to undertake acquisitions.

The coefficient estimates for the control variables are largely consistent with previous studies. We confirm a result reported by Harford (1999) with our finding that

Cash Holdings/TA increases the likelihood of undertaking an acquisition, suggesting that cash-rich firms are more likely to be acquirers in firm acquisitions. Furthermore, firms with higher *Stock Return* and *EBITDA/TA* are more likely to make acquisitions, whereas *Market Leverage* is negatively associated with the likelihood of making an acquisition (Almazan, de Motta, Titman, and Uysal, 2010). *Industry M&A Liquidity* and *Herfindahl Index* have a positive and a negative effect, respectively, on the probability of making an acquisition (Uysal, 2011). One notable result is that while the coefficient on *Sales* for whole firm acquisitions is reliably positive, indicating that large firms are more likely to be acquirers (Cai and Vijh, 2007), the

Sales coefficient for subsidiary purchases is not. Size, as measured by sales, and having a debt rating are clearly correlated. In sensitivity tests, we find that including the rating indicator reduces the magnitude of the positive coefficient on sales for whole firm acquisitions and makes the coefficient insignificant for subsidiary acquisitions.

3.2. Rating and premiums paid to target firms

In this subsection, we examine whether having a debt rating influences premiums paid for the target firms, which are available only for the subsample of public firm acquisitions. To assess the premiums paid to target firms, we utilize an estimation procedure that is similar to that used by Schwert (1996). First, we estimate the normal returns to target shareholders from market model regressions for the target firms in a 200-day estimation window $(-205, -6)$, in which time zero is the announcement date. In these regressions, the market returns are the value-weighted index returns, including dividends, for the combined New York Stock Exchange, American Stock Exchange, and Nasdaq. Second, we calculate the abnormal returns as the deviation from the predicted target returns. We generate three measures for target premium. First, similar to Schwert (1996), we generate the cumulative abnormal returns (CARs) to the target shareholders over the period starting one day before the announcement and one day before the effective date. Second, we use three day cumulative abnormal returns covering one day before and one day after the announcement day (Target CAR $(-1,+1)$). As a third proxy, we alternatively use cumulative abnormal returns over two days prior to the announcement to two days after the announcement day (Target CAR $(-2,+2)$).

Previous studies show that a number of factors influence the premiums paid for the target firms, including asymmetric information, competition for the target, growth opportunities, agency problems, and stock overvaluation (Shleifer and Vishny, 2003). Therefore, the regressions include several acquirer (size, profitability, stock return, and market-to-book ratio), target (target's market-to-book ratio, tangible assets ratio and organizational form), deal (dummy variables for within-industry acquisitions and multiple bidders), and industry (*Industry M&A Liquidity* and *Herfindal Index*) characteristics. Furthermore, we add year dummies in the regressions to account for macroeconomic changes in the time series.

Table 4 reports the positive and significant effects of *Rating* on the acquisition premium measures. Specifically, targets receive 5.5% higher premiums when their acquirers have a rating (Model 1). The positive and significant effect of *Rating* remains intact when we use *Target CAR* $(-1,+1)$ in Model 2. While the effect is still positive in Model 3, it is not statistically significant. These findings are also consistent with the positive effect of *Rating* on the probability of completing acquisitions, as shown in Table 3. Collectively, these findings are in line with the view that constrained access to debt markets reduces firms' ability to undertake acquisitions and further limits them from bidding aggressively for the targets they do pursue.

Other variables also significantly influence acquisition premiums. Consistent with Bargeron, Schlingemann, Stulz, and Zutter (2008), hostile offers are associated with larger premiums. The coefficients for *Market Leverage* are also negative and significant in both Models 2 and 3, indicating that highly leveraged firms pay lower premiums as in Uysal (2011). Overall, these findings are largely consistent with those reported in previous studies.

3.3. Does having a rating affect announcement returns to acquirers?

Sections 3.1 and 3.2 show that having a debt rating influences both the ability to undertake acquisitions and the terms of the acquisitions. In this subsection, we study whether *Rating* has a significant effect on the quality of an acquisition by examining market reactions to acquisition announcements, given by the acquirer's stock price reaction (*CAR*). We follow Fuller, Netter, and Stegemoller (2002) and calculate the acquirer's *CAR* over a five-day event window (two days before and two days after the announcement date). The benchmark returns are the value-weighted index returns, including dividends, for the combined New York Stock Exchange, American Stock Exchange, and Nasdaq.

Table 5 presents mean acquirer *CAR* values for the whole sample and various subsamples. The mean *CAR*s for firm and subsidiary acquisitions are positive. These are consistent with Masulis, Wang, and Xie (2007) and Hege, Lovo, Slovin, and Sushka (2009), who find positive mean *CAR*s for firm and subsidiary acquisitions, respectively. In the sample of all acquisitions, the mean *CAR* to nonrated firms is 0.021 and is significantly different from zero at the 1% level. Furthermore, nonrated acquirers attain greater *CAR*s than rated acquirers. These findings continue to be true for subsamples of firm and subsidiary acquisitions. Finally, we find positive and higher *CAR*s to nonrated acquirers in all payment method subsamples. These results also remain intact for all subsamples of leverage quartiles. Overall, these findings lend further support to the prediction that access to debt markets influences the quality of acquisitions undertaken.

The univariate evidence demonstrating a negative association between *Rating* and acquirer *CAR* does not account for several important factors that affect acquirer returns. For example, Moeller, Schlingemann, and Stulz (2004) show that firm size is negatively associated with announcement returns. To disentangle the effect of firm size, we include *Sales* in the multivariate regression. We also include *Market Leverage* to account for the effect of leverage on acquirer returns. Furthermore, we follow prior literature and control for acquirer, target, deal, and industry characteristics. Table 6 reports the coefficient estimates of regressions of acquirer *CAR* on *Rating*, annual dummies, and control variables. The models have an R^2 of 4.5% for all acquisitions, 5.3% for firm acquisitions, and 5.0% for subsidiary acquisitions. These are comparable to *CAR* regressions in previous studies (e.g., Masulis, Wang, and Xie, 2007; Moeller, Schlingemann, and Stulz, 2004).

Table 6 reports significant and negative effects of *Rating* on acquirer *CAR*. Specifically, *CAR* to rated acquirers is

Table 5
Debt ratings and acquirer Cumulative Abnormal Returns (CAR).
  The table reports mean values for acquirer CAR ($-2, +2$) in the whole sample and various subsamples. Variable definitions are in Appendix A. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% level, respectively.

	Whole sample	Rated	Non-rated	Rated − Non-rated
All acquisitions	0.016***	0.008***	0.021***	− 0.013***
Firm acquisitions	0.008***	− 0.003	0.014***	− 0.017***
Subsidiary acquisitions	0.022***	0.017***	0.025***	− 0.008***
All cash	0.015***	0.011***	0.018***	− 0.007**
All stock	0.007***	− 0.005	0.013***	− 0.018***
Combo	0.013***	0.007***	0.016***	− 0.009***
Market leverage quartile=1 (lowest)	0.010***	− 0.001	0.012***	− 0.013***
Market leverage quartile=2	0.017***	0.003*	0.024***	− 0.021***
Market leverage quartile=3	0.016***	0.008***	0.024***	− 0.016***
Market leverage quartile=4 (largest)	0.030***	0.021***	0.041***	− 0.020***

80 basis points lower than that to nonrated acquirers, a decrease of 50% over the sample average (Model 1). We continue to find negative and significant effects of *Rating* in firm (-0.010 in Model 2) and subsidiary acquisitions (-0.006 in Model 3). The results are qualitatively similar when we use a threeday event window (one day before and one day after the announcement date) in the calculation of *CAR* in an unreported analysis. Collectively, these findings indicate that having access to debt markets affects the quality of acquisition choices. Specifically, managers of nonrated firms pursue acquisitions that create more value relative to those of managers of rated firms.

We confirm a result reported by Masulis, Wang, and Xie (2007) with our finding that *CAR* decreases with the *Market-to-Book* ratio. Furthermore, *CAR* is negatively associated with the public status of the target, as shown in Chang (1998) and Fuller, Netter, and Stegemoller (2002). A positive association also exists between *CAR* and relative deal size, consistent with Asquith, Bruner, and Mullins (1983). Finally, *CAR* increases with *Market Leverage*, as in Maloney, McCormick, and Mitchell (1993).

Although we find a strong negative association between *Rating* and *CAR*, we recognize that the *CAR* analysis in this subsection is built upon the premise that stock prices accurately and immediately reflect the impact of acquisitions on firm values. If investors make systematic errors in evaluating acquisitions at the announcement dates, then there will be (systematic) price reversals in the long run. This implies that portfolios of nonrated acquirers will under-perform relative to portfolios of rated acquirers in the long run. To test this conjecture, we follow Moeller, Schlingemann, and Stulz (2004) and employ four factors from the Fama and French (1993) and Carhart (1997) models.[5] For each group of rated and nonrated firms, we construct equally weighted monthly portfolios of firms that made an acquisition in the past five years and calculate the net return on these portfolios, defined as the monthly portfolio return less the risk-free return. To assess the effects of *Rating* on the long-run abnormal

acquirer returns, we use the intercept terms (*Alpha*) in the regressions of the net portfolio returns on the four factors.

Table 7 reports the intercept terms of the net acquirer returns regressions and indicates that portfolios of nonrated acquirers do not under-perform relative to portfolios of rated acquirers in the long run in *All Acquisitions*, *Firm Acquisitions*, and *Subsidiary Acquisitions*. Furthermore, the analyses in *All Cash*, *All Stock,* and *Combo* subsamples yield qualitatively similar results. The results also remain intact for the subsamples of leverage quartiles. As the results find no price reversals for nonrated acquirers in the long run, they validate the average positive market reaction to nonrated acquirers shown in Tables 5 and 6, substantiating the view that managers of nonrated firms pursue better acquisitions on average.

3.4. Are the constraints imposed on nonrated firms optimal?

Our findings of rated firms' high premiums, lower announcement returns, and high likelihood of undertaking acquisitions are consistent with the free cash flow hypothesis (Jensen, 1986), which suggests that managers of rated firms use easier access to capital to make acquisitions that benefit themselves personally. However, these findings are also consistent with the proposition that constrained access to debt markets impairs a firm's ability to undertake all positive NPV projects (financial constraints hypothesis). In this subsection, we examine whether the financial constraints are suboptimal. The free cash flow hypothesis predicts that the sign of the average market reaction to acquisitions made by rated firms is negative. However, we do not find negative average market reactions to rated acquirers in the short run (Table 5) or in the long run (Table 7). Further, when we examine the distribution of CARs, we find that rated and nonrated firms have a similar fraction of negative CARs, so it is not the case that rated firms have a positive average CAR but make more bad acquisitions on the margin.[6] Collectively, this evidence

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[5] These four factors are excess return on market (MKT), small-minus-big return (SMB), high-minus-low return (HML) and momentum (UMD).

[6] Many prior studies find a negative average acquirer CAR, but that has been due to samples of public targets. When we limit our own

Table 6

Acquirer cumulative abnormal return (CAR) regressions.

The table reports coefficient estimates of acquirer returns. Acquirer returns are calculated over a five-day event window (two days before and two days after the announcement date). The benchmark returns are the value-weighted index of returns including dividends for the combined New York Stock Exchange, American Stock Exchange, and Nasdaq. Variable definitions are in Appendix A. The p-values are given in parentheses and are adjusted for heteroskedasticity and for clustering by firm. All regressions include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% level, respectively.

Variable	All acquisitions	Firm acquisitions	Subsid. acquisitions
	(1)	(2)	(3)
Rating dummy	−0.008***	−0.010***	−0.006**
	(0.001)	(0.008)	(0.026)
Market leverage	0.038***	0.030***	0.043***
	(<0.001)	(0.003)	(<0.001)
Cash Holdings/TA	0.000	0.000	0.000
	(0.957)	(0.973)	(0.979)
Sales	−0.001	−0.001	0.000
	(0.275)	(0.153)	(0.920)
Relative size	0.009***	0.001	0.016***
	(<0.001)	(0.357)	(<0.001)
Market-to-book	−0.003**	−0.003*	−0.002
	(0.019)	(0.073)	(0.190)
EBITDA/TA	0.003	0.007	−0.001
	(0.731)	(0.568)	(0.964)
Stock return	0.008***	0.009***	0.008***
	(<0.001)	(0.002)	(0.002)
Public target	−0.039***	−0.032***	−0.025
	(<0.001)	(<0.001)	(0.179)
Private target	−0.002	−0.001	−0.002
	(0.279)	(0.911)	(0.349)
Within-industry acquisition	−0.000	−0.001	0.001
	(0.918)	(0.612)	(0.670)
All cash	0.005**	0.013***	−0.002
	(0.018)	(<0.001)	(0.282)
Competed	−0.014	−0.013	−0.005
	(0.146)	(0.134)	(0.883)
Hostile	−0.006	0.003	−0.177***
	(0.650)	(0.799)	(<0.001)
Industry M&A liquidity	−0.004	0.017	−0.010
	(0.786)	(0.406)	(0.582)
Herfindahl index	0.005	0.016	−0.002
	(0.444)	(0.135)	(0.837)
Year fixed effects	Yes	Yes	Yes
Number of observations	10,880	4,489	6,391
R-squared	0.045	0.053	0.050

Table 7

Long-run stock price performance.

The table reports monthly abnormal returns over five years following the completion of an acquisition. The monthly abnormal return is the intercept term of the regression of monthly equally weighted portfolio returns on four factors in Fama and French (1993) and Carhart (1997) models. The table indicates that there are no price reversals in the long-run. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels.

	Rated	Non-rated	Rated − Non-rated
All acquisitions	0.001	0.004***	−0.003**
Firm acquisitions	0.001	0.003***	−0.002
Subsidiary acquisitions	0.002	0.004***	−0.002*
All cash	0.002*	0.004***	−0.002**
All stock	0.000	0.002	−0.002
Combo	0.001	0.003***	−0.002
Market leverage quartile=1 (lowest)	0.001	0.003***	−0.002*
Market leverage quartile=2	0.001*	0.003**	−0.002
Market leverage quartile=3	0.002	0.003*	−0.001
Market leverage quartile=4 (largest)	0.000	0.005**	−0.005**

suggests that the free cash flow hypothesis cannot explain the findings presented in this paper.

One final alternative explanation is that rated acquirers pick targets with similar potential synergies as those picked by nonrated acquirers, but they bid higher and so transfer more of the total synergies to the target shareholders. To examine this alternative, we estimate regressions to explain the value-weighted combined bidder and target CAR for the acquisition announcement in the subsample of public firm acquisitions. The results are presented in Table 8. The coefficient on the rated acquirer is negative and significant, showing that the total value creation is lower for rated acquirers. This result is inconsistent with the hypothesis that rated acquirers simply transfer more wealth to target shareholders.

The results are most consistent with the hypothesis that firms without access to public debt markets are financially constrained, forcing them to limit their investment to the highest NPV projects. Because unconstrained firms can take all positive NPV projects, their marginal project will create less value than the marginal project of a constrained firm, reducing the average. This is reflected in the lower, but still positive, average announcement returns for rated firm acquisitions. Thus, the source of financing matters for investment.

3.5. Robustness

In, we include firm and industry characteristics to disentangle the effect of having a rating. The implicit assumption in these analyses is that having a debt rating is exogenous to the firm-determined by supply constraints driven by market imperfections. This is consistent with the conclusion of Faulkender and Petersen (2006). They also point out that firms, such as Apple at the time, that could

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(footnote continued)

sample to only public targets, we also find negative average acquirer CARs. Table 8 indicates that rated acquirers receive more unfavorable market reaction relative to nonrated acquirers in this subsample.

Table 8

Total value creation.

　　The table reports coefficient estimates of target, acquirer and combined returns for the subsample of public firm acquisitions. Acquirer and target returns are calculated over a five-day event window (two days before and two days after the announcement date). Combined returns are value-weighted acquirer and target returns over a five-day event window. Variable definitions are in Appendix A. The *p*-values are given in parentheses and are adjusted for heteroskedasticity and for clustering by firm. All regressions include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	Target firm (1)	Acquirer firm (2)	Combined (3)
Rating dummy	0.026 (0.126)	−0.016*** (0.008)	−0.012** (0.029)
Market leverage	−0.095** (0.024)	0.001 (0.962)	0.017 (0.293)
Cash holdings/TA	0.001 (0.982)	−0.033 (0.116)	−0.020 (0.314)
Sales	0.008* (0.073)	0.004** (0.036)	−0.003* (0.088)
Market-to-book	0.007 (0.278)	−0.005* (0.064)	−0.007*** (0.004)
EBITDA/TA	−0.023 (0.547)	0.009 (0.752)	0.014 (0.552)
Stock return	−0.002 (0.857)	0.011** (0.037)	0.010** (0.040)
Within-industry acquisition	0.005 (0.683)	0.006 (0.251)	0.006 (0.190)
All cash	0.109*** (0.000)	0.030*** (0.000)	0.021*** (0.000)
Competed	−0.049** (0.016)	−0.011 (0.278)	−0.007 (0.397)
Hostile	0.116*** (0.007)	0.005 (0.737)	0.037** (0.024)
Industry M&A liquidity	−0.069 (0.294)	0.044 (0.153)	0.063** (0.027)
Herfindahl index	0.033 (0.482)	0.009 (0.687)	0.038** (0.044)
Tangible assets/TA (target firm)	−0.111*** (0.000)	−0.010 (0.349)	−0.007 (0.439)
Market-to-book (target firm)	−0.022*** (0.000)	−0.005** (0.038)	−0.004* (0.080)
Year fixed effects	Yes	Yes	Yes
Number of observations	1,470	1,470	1,470
R-squared	0.107	0.077	0.078

have a favorable public debt rating but do not are the exception. Our main concern is that there are firm characteristics that simultaneously determine whether a firm has a debt rating and whether it acquires. We, therefore, focus most of our robustness effort on this issue. We are less concerned about reverse causality, that is, that firms see acquisition possibilities and then make an effort to relax their financial constraints to make those acquisitions. Even if some firms are able to relax their financial constraints such that this is part of the explanation, it still means that access to public debt markets affects the

acquisitions a company can make. Furthermore, we are interested in the bidding and value-creation implications of access to public debt markets, not simply the act of acquiring.

　　Factors influencing the decision to access the public debt markets could also influence acquisition decisions. To address this problem, we examine whether a change in rating status has an effect on the likelihood of undertaking an acquisition. Specifically, we restrict our subsample to firms that did not have a rating two years prior to acquisition ($t-2$) and study whether having a rating in the subsequent year ($t-1$) has a meaningful effect on acquisition decisions at $t=0$ relative to a subsample of firms that did not have a rating at $t-2$ and $t-1$. Both probit and tobit analyses in Table 9 show significant effects of rating on acquisition decisions. In particular, firms with debt ratings are 4.8% more likely to make an acquisition (Model 1). The positive and significant effect of *Rating* continues to hold for both firm (2.5%) and subsidiary acquisitions (3.4%) in Models 3 and 5, respectively. Having a rating also increases the size of acquisitions by 1.5% (Model 2). The effect of *Rating* remains significant for both firm and subsidiary acquisitions in Models 4 and 6, respectively. Firms relax their financing constraints by becoming rated and this is reflected quickly in their investment policy. We now conduct tests to ensure that it is not simply the characteristics of rated firms that drive both getting rated and making an acquisition.

　　To further alleviate the concerns that our findings are driven by firm characteristics (e.g., firm size) that are correlated with *Rating Dummy*, we replicate our analyses for a subsample of rated firm-years with control nonrated firm-years matched by industry and size. For each rated firm, we choose a nonrated firm sharing the same three-digit standard industrial classification (SIC) with the closest value of *Sales* that year. To ensure a reasonable size match, we drop both sample and control firms if the difference in *Sales* between the sample and control firms exceeds 10%. This process generates a subsample of 7,632 firm-years (3,816 rated and 3,816 nonrated). After verifying that sample and control firms are not statistically different in size, we replicate the probit and tobit analyses of acquisition decisions in this subsample in Table 10. We continue to find positive and significant effects of *Rating Dummy* on both the likelihood of undertaking an acquisition and the size of that acquisition in *All Acquisitions, Firm Acquisitions* and *Subsidiary* Acquisitions. In an unreported analysis, we continue to find a significant effect of *Rating* when we match rated and nonrated firms by industry and leverage. These findings confirm that having access to public debt markets has an effect on acquisition decisions, distinct from industry and size.

　　We further disentangle the effect of having a rating by examining the portion of rating that is not explained by industry and firm characteristics. Specifically, we implement an approach analogous to the one in Faulkender and Petersen (2011) and include the residual probability of having a rating in our analysis while controlling for the probability of having a rating as well as for firm and industry characteristics. This approach allows us to disentangle the incremental effect of a debt rating on the

Table 9

Acquisition activity of subsample of non-rated firms ($t-2$).

The table presents probit analysis in odd-numbered models and tobit analysis in even-numbered models for the subsample of firms that did not have a rating at t-2. The dependent variable in probit models takes a value of one if the firm undertakes an acquisition, and tobit analysis estimates the ratio of sum of acquisition value to the firm's total assets. The estimates in probit models are marginal effects. Variable definitions are in Appendix A. The p-values are given in parentheses and are adjusted for standard errors clustered by firm and year. All models include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% level, respectively.

Variable	All acquisitions		Firm acquisitions		Subsidiary acquisitions	
	(1)	(2)	(3)	(4)	(5)	(6)
Rating dummy	0.048***	0.015***	0.025***	0.008***	0.034***	0.006***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Sales	0.015***	0.004***	0.008***	0.002***	0.008***	0.001***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Cash holdings/TA	0.037**	0.011**	0.028***	0.008***	0.004	0.001
	(0.010)	(0.010)	(<0.001)	(<0.001)	(0.703)	(0.712)
Market leverage	−0.125***	−0.038***	−0.055***	−0.017***	−0.082***	−0.014***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Stock return	0.018***	0.007***	0.009***	0.003***	0.013***	0.002***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Market-to-book	−0.003*	0.000	0.002	0.001**	−0.006***	−0.001***
	(0.078)	(0.538)	(0.108)	(0.018)	(<0.001)	(<0.001)
EBITDA/TA	0.095***	0.031***	0.031***	0.009***	0.073***	0.013***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Industry M&A liquidity	0.137***	0.043***	0.058***	0.018***	0.097***	0.016***
	(<0.001)	(<0.001)	(0.002)	(0.003)	(<0.001)	(<0.001)
Herfindahl index	−0.066***	−0.020***	−0.029***	−0.009***	−0.044***	−0.007***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	45,032	45,032	45,032	45,032	45,032	45,032
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

likelihood of undertaking an acquisition while holding the firm characteristics and the probability of having a rating constant.

Similar to Faulkender and Petersen (2011), who study the effect of capital repatriation under the American Jobs Creation Act of 2004, we are interested in the effect of access to capital on investment. As Faulkender and Petersen (2011) point out, it is critical to distinguish from those firms that could gain access but do not and those that do gain access. In their case, this was the distinction between firms with funds that could be repatriated but did not repatriate and those that repatriated the funds. In our case, the distinction is between those firms that qualify for a debt rating but do not get one and those that get a debt rating and the access to public debt markets that comes with it. The coefficient on predicted rating captures the effect of qualifying for a rating on acquisition likelihood, and the coefficient on the residual captures the effect of getting a rating on acquisition likelihood.

We estimate the predicted probability of having a debt rating [$Pr(Rating=1)$] by implementing a probit analysis in Appendix B while the residual probability (Residual(Rating)) is Rating Dummy minus the predicted probability. In addition to including control variables in Table 3, we use three measures that are suggested by Faulkender and Petersen (2006) in the probit model estimating the likelihood of having a debt rating. These constructs are whether the firm

is included in the Standard & Poor's (S&P) 500 index (S&P 500 Dummy), whether it is listed on the NYSE (NYSE Dummy), and the ratio of rated firms in the firm's industry grouping (Ratio of Rated Firms). Consistent with Faulkender and Petersen (2006), we find that all these measures have a significant and positive effect on the probability of having a rating.

Table 11 reports the marginal effects of the residual probability of rating for the probit analyses in odd-numbered models and the marginal effects of the tobit analyses in even-numbered models. Model 1 accounts for the predicted probability and reports a significant effect of the residual probability on the likelihood of undertaking an acquisition. The results remain intact when we add industry and firm characteristics in Model 3. The tobit analyses in Models 2 and 4 also show positive and significant effects of the residual probability on the size of acquisitions. We continue to find positive and significant effects of the residual probability for firm and subsidiary acquisitions. Controlling for the characteristics of rated firms, the act of getting rated to access the public bond market significantly relaxes financing constraints and has a real effect on investment decisions.

We also conduct probit analyses for the subsamples of sales, leverage and market to book quartiles in Table 12. While Rating Dummy has positive and significant effects in all sales quartiles on the likelihood of making an

Table 10

Matching by industry and size.

   The table presents probit analyses in odd-numbered models and tobit analyses in even-numbered models. The dependent variable in probit models takes a value of one if the firm undertakes an acquisition, and the tobit analysis estimates the ratio of sum of acquisition value to the firm's total assets. The estimates in probit models are marginal effects. These analyses are conducted for the subsample of rated firms with a matching control group of non-rated firms. We generate the control group by matching industry (3-digit SIC) and *Sales*. Variable definitions are in Appendix A. The *p*-values are given in parentheses and are adjusted for standard errors clustered by firm and year. All models include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% level, respectively.

Variable	All acquisitions		Firm acquisitions		Subsidiary acquisitions	
	(1)	(2)	(3)	(4)	(5)	(6)
Rating dummy	0.059***	0.017***	0.027***	0.008***	0.044***	0.006***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Sales	−0.015***	−0.006***	−0.002	−0.001	−0.014***	−0.003***
	(<0.001)	(<0.001)	(0.415)	(0.162)	(<0.001)	(<0.001)
Cash holdings/TA	0.028	0.006	0.066***	0.018***	−0.067***	−0.011***
	(0.439)	(0.549)	(0.003)	(0.002)	(0.009)	(0.003)
Market leverage	−0.170***	−0.048***	−0.083***	−0.023***	−0.118***	−0.017***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Stock return	0.017*	0.006*	0.011**	0.003**	0.013*	0.002**
	(0.094)	(0.060)	(0.032)	(0.031)	(0.055)	(0.035)
Market-to-book	−0.004	0.001	0.001	0.001	−0.006	−0.001
	(0.448)	(0.719)	(0.65)	(0.346)	(0.268)	(0.362)
EBITDA/TA	0.164***	0.046***	0.076***	0.020***	0.094***	0.015***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Industry M&A liquidity	0.331***	0.098***	0.160***	0.046***	0.233***	0.036***
	(<0.001)	(<0.001)	(0.005)	(0.006)	(<0.001)	(<0.001)
Herfindahl index	−0.051	−0.013	0.000	0.000	−0.056*	−0.008
	(0.175)	(0.235)	(0.986)	(0.984)	(0.099)	(0.119)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	7,632	7,632	7,632	7,632	7,632	7,632
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

acquisition, the effect is smallest in the subsample containing the largest sales quartile. Furthermore, the estimates for *Rating Dummy* are positive and significant in all but the lowest market leverage quartile and the effect is the smallest economically in this quartile as well. The smallest estimates of *Rating Dummy* in the largest sales and the smallest market leverage quartiles indicate that access to public debt markets least improve acquisition opportunities of large and underleveraged firms. These large, underleveraged firms are arguably the small part of the population that forgoes the public debt markets by choice; that is, these are the firms for which supply effects are least likely to be binding. A large firm or low leverage firm should be less likely than a smaller or more levered firm to be at or near the maximum leverage that private lenders would supply. Thus, if these firms are not acquiring with debt financing, it is likely that demand, not supply effects are at work. These results are consistent with the rating dummy capturing a supply effect because the effect is smallest for the subsamples of firms for which the supply effect is least likely to be binding.

   Theoretical work by Shleifer and Vishny (2003), and Rhodes-Kropf and Viswanathan (2004) and empirical work by Rhodes-Kropf, Robinson, and Viswanathan (2005) also suggest that overvaluation leads some firms to acquire. Debt market access could be related to overvaluation, so what we are finding could be an overvaluation effect. We examine the

correlation between a firm's market-to-book ratio and having a debt rating and find that it is negative (−0.08), consistent with findings in Faulkender and Petersen (2006). The average *Market-to-Book* for rated firms is 1.64, significantly lower than that for nonrated firms (1.85). We further examine the effect of *Rating Dummy* on the likelihood of making an acquisition for the subsamples of *Market-to-Book* quartiles. *Rating Dummy* continues to have a significant effect in each quartile. While market-to-book ratio is not a perfect measure of overvaluation, few would argue that a low market-to-book ratio is a characteristic of an overvalued firm. Thus, we conclude that the debt market access effect is distinct from any overvaluation effect.

   We also examine the role of a firm's degree of information opacity in our analysis. Specifically, firms that are informationally opaque are less likely to have a rating. We use two proxies to capture information opacity. First, we use lack of any analyst coverage, as analysts generate information for market participants (Womack, 1996; Hong and Kubik, 2003). In Table 13, we continue to find significant and positive effects for *Rating Dummy* on the acquisition probability for both subsamples of covered and noncovered firms. Second, we replicate our analysis for institutional holdings quartiles, as a large presence of institutional holdings is likely to mitigate asymmetric information problems. Table 13 reports that *Rating Dummy* is positive and significant in all institutional holdings quartiles. These findings indicate that

Table 11

Residual probability of having a rating.

The table presents marginal effects of probit analyses in odd-numbered models and tobit analyses in even-numbered models and accounts for the probability of having a rating. The dependent variable in the probit models takes a value of one if the firm undertakes an acquisition, and tobit analysis estimates the ratio of sum of acquisition value to the firm's total assets. Variable definitions are in Appendix A. The *p*-values are given in parentheses and are adjusted for standard errors clustered by firm and year. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	All acquisitions				Firm acquisitions				Subsidiary acquisitions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Residual (rating)	0.057***	0.017***	0.057***	0.017***	0.026***	0.008***	0.025***	0.007***	0.040***	0.006***	0.039***	0.006***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Pr(rating=1)	0.026***	0.004***	−0.033***	−0.009***	0.025***	0.006***	−0.010	−0.003	0.003	−0.001	−0.028**	−0.004**
	(0.001)	(0.132)	(0.015)	(0.019)	(<0.001)	(<0.001)	(0.134)	(0.162)	(0.612)	(0.245)	(0.017)	(0.017)
Sales			0.018***	0.004***			0.011***	0.003***			0.008***	0.001***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Cash holdings/TA			0.024*	0.008**			0.029***	0.008***			−0.012	−0.002
			(0.061)	(0.041)			(<0.001)	(<0.001)			(0.140)	(0.166)
Market leverage			−0.117***	−0.033***			−0.059***	−0.017***			−0.070***	−0.011***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Stock return			0.020***	0.007***			0.010***	0.003***			0.013***	0.002***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Market-to-book			−0.002	0.000			0.002**	0.001***			−0.005***	−0.001***
			(0.172)	(0.861)			(0.029)	(0.002)			(<0.001)	(<0.001)
EBITDA/TA			0.113***	0.035***			0.036***	0.011***			0.085***	0.014***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Industry M&A liquidity			0.202***	0.060***			0.093***	0.026***			0.143***	0.022***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Herfindahl index			−0.067***	−0.020***			−0.036***	−0.011***			−0.037***	−0.005***
			(<0.001)	(<0.001)			(<0.001)	(<0.001)			(<0.001)	(<0.001)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	69,139	69,139	69,139	69,139	69,139	69,139	69,139	69,139	69,139	69,139	69,139	69,139
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 12

Probit analyses by size, market leverage and market-to-book quartiles.

The table presents probit analyses for the subsamples of *Sales*, *Market leverage* and *Market-to-book* quartiles. Quartiles 1 and 4 indicate the smallest and largest quartile, respectively. The dependent variable takes a value of one if the firm undertakes an acquisition. The estimates in probit models are marginal effects. Variable definitions are in Appendix A. The *p*-values are given in parentheses and are adjusted for standard errors clustered by firm and year. All models include year dummies. ***, ** and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	Sales quartiles				Market leverage quartiles				Market-to-book quartiles			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Rating dummy	0.078***	0.095***	0.062***	0.050***	0.008	0.039***	0.067***	0.034***	0.017***	0.055***	0.062***	0.026**
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.507)	(<0.001)	(<0.001)	(<0.001)	(0.002)	(<0.001)	(<0.001)	(0.028)
Sales	0.051***	0.009	0.007	−0.014***	0.023***	0.009***	−0.002	0.000	0.003**	−0.001	0.003	0.019***
	(<0.001)	(0.250)	(0.371)	(0.001)	(<0.001)	(<0.001)	(0.392)	(0.906)	(0.039)	(0.730)	(0.199)	(<0.001)
Cash holdings / TA	0.046***	0.038**	0.008	0.006	0.079***	0.022	−0.003	0.022	0.022	0.019	0.022	0.073***
	(<0.001)	(0.017)	(0.783)	(0.868)	(<0.001)	(0.363)	(0.912)	(0.366)	(0.115)	(0.438)	(0.371)	(<0.001)
Market leverage	−0.068***	−0.153***	−0.183***	−0.200***	−0.279***	0.009	−0.132***	−0.148***	−0.069***	−0.097***	−0.098***	−0.162***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.003)	(0.890)	(0.005)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Stock return	0.016***	0.022***	0.022***	0.013	0.027***	0.019***	0.013***	0.014***	0.007	0.006	0.019***	0.033***
	(<0.001)	(<0.001)	(0.003)	(0.188)	(<0.001)	(0.003)	(0.001)	(0.002)	(0.153)	(0.202)	(0.003)	(<0.001)
Market-to-book	−0.003*	−0.002	−0.002	−0.001	−0.005*	0.003	0.007	0.008***	0.066***	0.086***	0.005	−0.009***
	(0.068)	(0.567)	(0.611)	(0.825)	(0.051)	(0.530)	(0.129)	(0.002)	(<0.001)	(<0.001)	(0.708)	(<0.001)
EBITDA/TA	0.039***	0.115***	0.102***	0.040	0.089***	0.178***	0.183***	0.098***	0.052**	0.180***	0.156***	0.121***
	(<0.001)	(<0.001)	(<0.001)	(0.361)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.019)	(<0.001)	(<0.001)	(<0.001)
Industry M&A liquidity	0.107***	0.178***	0.275***	0.187***	0.106**	0.252***	0.176***	0.148***	0.151***	0.150***	0.198***	0.162***
	(<0.001)	(<0.001)	(<0.001)	(0.01)	(0.045)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.003)	(0.002)	(0.006)
Herfindahl index	−0.066***	−0.059***	−0.076***	−0.048**	−0.135***	−0.074***	−0.038**	−0.031**	−0.030**	−0.054***	−0.066***	−0.116***
	(<0.001)	(0.003)	(0.001)	(0.047)	(<0.001)	(<0.001)	(0.018)	(0.021)	(0.036)	(0.001)	(0.009)	(<0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,291	17,290	17,291	17,290	17,290	17,291	17,291	17,290	17,291	17,290	17,291	17,290
P-Value	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 13

Probit analyses by analyst coverage, institutional holdings and age quartiles.

The table presents probit analyses for the subsamples of analyst coverage, institutional holdings and age quartiles. Quartiles 1 and 4 indicate the smallest and largest quartile, respectively. The dependent variable takes a value of one if the firm undertakes an acquisition. The estimates in probit models are marginal effects. Variable definitions are in Appendix A. The p-values are given in parentheses and are adjusted for standard errors clustered by firm and year. All models include year dummies. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% level, respectively.

Variable	Analyst coverage		Institutional holding quartiles				Age quartiles			
	Covered	Non-Covered	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Rating dummy	0.048***	0.034***	0.038***	0.045***	0.045***	0.047***	0.064***	0.036***	0.023***	0.050***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.004)	(<0.001)
Sales	0.005***	0.002*	−0.006***	0.003	0.002	0.003	0.003	0.009***	0.010***	0.008***
	(0.015)	(0.089)	(<0.001)	(0.196)	(0.450)	(0.475)	(0.337)	(<0.001)	(<0.001)	(0.001)
Cash holdings/TA	0.015	0.027	−0.008	0.011	0.010	0.058**	0.034**	0.029	0.015	−0.005
	(0.447)	(0.101)	(0.572)	(0.536)	(0.601)	(0.033)	(0.032)	(0.129)	(0.486)	(0.880)
Market leverage	−0.200***	−0.053***	−0.027***	−0.064***	−0.150***	−0.250***	−0.142***	−0.147***	−0.124***	−0.150***
	(<0.001)	(<0.001)	(0.003)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Stock return	0.027***	0.016***	0.016***	0.024***	0.030***	0.025*	0.028***	0.013***	0.017***	0.011
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.053)	(<0.001)	(0.008)	(<0.001)	(0.123)
Market-to-book	−0.010***	0.000	−0.003	0.001	−0.003	−0.012**	−0.003	−0.005**	−0.004*	−0.010**
	(<0.001)	(0.869)	(0.132)	(0.694)	(0.321)	(0.012)	(0.188)	(0.041)	(0.084)	(0.017)
EBITDA/TA	0.149***	0.104***	0.073***	0.126***	0.118***	0.124***	0.135***	0.134***	0.101***	0.143***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Industry M&A liquidity	0.194***	0.120***	0.068***	0.209***	0.177***	0.279***	0.166***	0.161***	0.170***	0.213***
	(<0.001)	(0.001)	(0.006)	(<0.001)	(0.003)	(<0.001)	(<0.001)	(0.014)	(<0.001)	(<0.001)
Herfindahl index	−0.075***	−0.039***	−0.037***	−0.063***	−0.047**	−0.077***	−0.087***	−0.052**	−0.086***	−0.050**
	(<0.001)	(0.003)	(0.001)	(<0.001)	(0.049)	(<0.001)	(<0.001)	(0.028)	(<0.001)	(0.030)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	36,430	32,732	17,291	17,290	17,290	17,291	20,537	15,208	17,270	16,147
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

our results are not driven by differences in the information environment for rated and nonrated firms.

Finally, we examine whether the life cycle of firms influences our findings. Older, mature firms are more likely to have access to debt markets as they have a long track record (Petersen and Rajan, 1994, 2002). Thus, we replicate our analysis for age quartiles. While rated firms are more likely to make an acquisition in all age quartiles, the effect is largest for the subsample of young firms, suggesting that young firms benefit the most from access to debt markets. Collectively, these results indicate that the effect of having a rating is distinct from that of leverage, firm size, misvaluation, degree of information opacity and life cycle, while substantiating our conclusion that access to debt markets influences investment decisions.

4. Conclusion

This paper contributes to studies on the effect of access to debt markets on corporate investment decisions by showing the influence of having a debt rating on acquisition choices. The evidence presented in this paper demonstrates that having a debt rating affects both a firm's ability to undertake an acquisition and the quality of that acquisition. Specifically, we find that the likelihood of a firm undertaking an acquisition is higher for firms with debt ratings. Rated acquirers also pay higher premiums for their targets. Finally, they have lower stock price reactions to their acquisition announcements relative to those of non-

rated acquirers while their average acquisition still does not destroy value. These findings collectively suggest that constrained access to debt markets induces managers to be more selective in their investments such that they cannot exhaust all positive NPV projects, providing evidence that the source of financing matters not only in financing decisions, but also in investing decisions.

Appendix A. Variable definitions

All Acquisitions refers to all domestic transactions in the US for $1 million or more over a year listed in the SDC M&A database as an acquisition of majority interest, merger, asset acquisition or acquisition of certain assets.

Acquisitions Value/TA is the ratio of the total dollar volume of all acquisitions made by the firm during a year to the firm's *Total Assets* (Item *AT*) at the beginning of the year.

All Cash takes a value of one if the transaction is paid with all cash.

All Stock refers to all-stock financed acquisitions.

Acquirer is a dummy variable that takes a value of one if the firm is identified as an acquirer in *All Acquisitions* by the SDC M&A database, and of zero otherwise.

Book Debt is *Total Assets* (Item AT) minus *Book Equity*.

Book Equity is defined as *Total Assets* (Item *AT*) minus liabilities (Item *LT*) plus balance sheet deferred taxes and investment tax credit (Item *TXDITC*) minus *Preferred Stock*.

Book Leverage is *Book Debt* over *Total Assets* (Item AT).

CAR is the cumulative abnormal returns to bidders, which are calculated over a five-day event window (two days before and two days after the announcement date). The benchmark returns are the value-weighted index of returns including dividends for the combined New York Stock Exchange, American Stock Exchange, and Nasdaq.

Cash Holdings/TA is item *CHE* divided by item *AT*

Cash Percentage is the percentage of cash offered in the transaction.

Combo takes a value of one if the transaction is paid with a mix of cash, equity and other considerations.

Competed takes a value of one if there is more than one bidder.

Cross-Industry Acquisitions refers to acquisitions in which the acquirer and the target do not belong to the same 3-digit SIC.

Cross-Industry Acquisitions Value/TA is the ratio of the total dollar volume of *Cross-Industry Acquisitions* made by the firm during a year to the firm's *Total Assets* (Item *AT*) at the beginning of the year.

Cross-Industry Acquirer is a dummy variable that takes a value of one if the firm is identified as an acquirer in a *Cross-Industry Acquisition*, and is zero otherwise.

EBITDA/TA is operating income before depreciation (Item *OIBDP*) over *Total Assets* (Item *AT*).

Firm Acquisitions refers to all domestic transactions in the US for $1 million or more over a calendar year listed in the SDC M&A database as an acquisition of majority interest or merger.

Firm Acquisitions Value/TA is the ratio of the total dollar volume of *Firm Acquisitions* made by the firm during a year to *Total Assets* (Item *AT*) at the beginning of the year.

Herfindahl Index is sum of the squares of the market shares of all firms sharing the same three-digit SIC, in which market share is defined as sales of a firm (Item *Sale*) to sum of sales with the industry.

Hostile is set to one if SDC identifies the acquisition as hostile

Industry M&A Liquidity is sum of *Acquisitions Value* for each year and three-digit SIC code divided by *Total Assets* (Item *AT*) of all COMPUSTAT firms in the same three-digit SIC and year.

Market Equity is common shares outstanding (Item *CSHO*) times the stock price (Item *PRCC_F*).

Market Leverage is *Book Debt* over *Market Value*.

Market-to-Book ratio is *Market Value* over *Total Assets* (Item *AT*).

Market Value is defined as liabilities (Item *LT*) minus balance sheet deferred taxes and investment tax credit (Item *TXDITC*) plus *Preferred Stock* plus *Market Equity* (Item *CSHO* x Item *PRCC_F*).

NYSE Dummy takes a value of one if the firm is listed on the NYSE.

Pr(Rating=1) is the predicted probability of having a rating based on the model in Appendix B.

Private Acquisitions (Private Target) refers to *All Acquisitions* in which the target (as defined by the SDC M&A database) is a private firm.

Public Acquisitions (*Public Target)* refers to acquisitions in which the target (as defined by the SDC M&A database) is a public firm.

Public Acquisitions Value/TA is the ratio of the total dollar volume of *Public Acquisitions* made by the firm during a year to the firm's *Total Assets* (Item *AT*) at the beginning of the year.

Public Acquirer is a dummy variable that takes a value of one if the firm is identified as an acquirer in *Public Acquisitions* by the SDC M&A database and zero otherwise.

Rating Dummy takes a value of one if the firm has a debt rating.

Ratio of Rated Firms is the ratio of rated firms in the firm's industry grouping based on the three-digit SIC.

Relative Size is the natural logarithm of the ratio of *Transaction Value* to *Total Assets* of the acquirer at the end of the fiscal year prior to the acquisition announcement.

Residual (Rating) is *Rating* minus the predicted probability of having a rating based on the model in Appendix B.

Sales is the natural logarithm of sales (Item *SALE*) in 1990 dollars.

Stock Return is the firm's annual stock return.

Subsidiary Acquisitions refers to all domestic transactions in the US for $1 million or more over a calendar year listed in the SDC M&A database as an asset acquisition or acquisition of certain assets.

Subsidiary Acquisitions Value/TA is the ratio of the total dollar volume of *Subsidiary Acquisitions* made by the firm during a year to the firm's *Total Assets* (Item *AT*) at the beginning of the year.

S&P 500 Dummy takes a value of one if the firm is included in the S&P 500 index.

Tangible Assets/TA is item PPENT divided by item AT

Target CAR is the cumulative abnormal returns to targets which are calculated over a five-day event window (two days before and two days after the announcement date). The benchmark returns are the value-weighted index of returns including dividends for the combined New York Stock Exchange, American Stock Exchange, and Nasdaq.

Total Assets (TA) is measured as the book value of assets (Item *AT*)

Transaction Value is the total value of considerations paid by the acquirer, excluding fees and expenses.

Within-Industry Acquisitions refers to acquisitions in which the acquirer and the target belong to the same 3-digit SIC.

Within-Industry Acquisitions Value/TA is the ratio of the total dollar volume of *Within-Industry Acquisitions* made by the firm during a year to the firm's *Total Assets* (Item 6) at the beginning of the year.

Within-Industry Acquirer is a dummy variable that takes a value of one if the firm is identified as an acquirer in a *Within-Industry Acquisition* and zero otherwise.

Appendix B

See Table B1.

Table B1

Probability of having a rating.

The table presents marginal effects of probit analysis in which the dependent variable takes a value of one if the firm has a rating. Variable definitions are in Appendix A. The p-values are given in parentheses and are adjusted for standard errors clustered by firm and year. ***, **, and * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)
Ratio of rated firms	0.485***
	($<$0.001)
S&P 500 dummy	0.214***
	($<$0.001)
NYSE dummy	0.113***
	($<$0.001)
Cash holdings/TA	-0.038
	(0.410)
Market leverage	0.367***
	($<$0.001)
Sales	0.112***
	($<$0.001)
Stock return	0.010**
	(0.035)
Market-to-book	0.021***
	($<$0.001)
EBITDA/TA	-0.039
	(0.246)
Industry M&A liquidity	0.409***
	($<$0.001)
Herfindahl index	-0.123***
	($<$0.001)
Year fixed effects	Yes
Number of observations	69,139
Pseudo R-square	0.466
p-value	$<$0.001

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