Tapping into Financial Synergies: Alleviating Financial Constraints Through Acquisitions

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This version: January, 2021

Abstract

This paper examines whether firms are able to use acquisitions to ease their financial constraints. The results show that acquisitions do ease financing constraints for constrained acquirers. Relative to unconstrained acquirers, financially constrained firms are more likely to use undervalued equity to fund acquisitions and to target unconstrained and more liquid firms. Using a propensity score matched sample in a difference-in-difference framework, the results show that constrained acquirers become less constrained post-acquisition and relative to matched non-acquiring firms. This improvement is more pronounced for diversifying acquisitions and constrained firms that acquire rather than issue equity and retain the proceeds. Following acquisition, constrained acquirers raise more debt, increase investments, and reduce cash holdings relative to matched non-acquirers, consistent with experiencing reductions in financing constraints. These improvements are not seen for unconstrained acquirers. Finally, the familiar diversification discount is non-existent for financially constrained acquirers.

Keywords: Financial Constraints, Firm Structure, Diversification, Mergers & Acquisitions

JEL classification: G30, G32, G34, L25

*We thank (Editor), three anonymous referees, Heitor Almeida, David Denis, Jayant Kale, Semi Kedia, David McLean, Bernadette Minton, Darius Palia, Lee Pinkowitz, Jason Sturgess, Michael Weisbach, Toni Whited, seminar participants at Georgetown University, Rutgers University, University of Connecticut, George Mason University, George Washington University, Boston University, Federal Reserve Board of Governors, Office of the Comptroller of the Currency, Securities and Exchange Commission, participants at the 2013 AFFI/EUROFIDAI Paris Finance Conference, 2014 FMA Asia Meetings, 2014 FMA Annual Meetings, and 2017 Annual Cass Annual M&A Conference for helpful comments. The authors acknowledge financial support from the Center for Financial Markets and Policy at the McDonough School of Business at Georgetown University. The ideas in this paper solely those of the authors and do not necessarily reflect the view of the Federal Reserve System. All remaining errors are our own.

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1 Introduction

“The Company is continually evaluating business opportunities such as joint ventures and mergers and acquisitions with the objective of creating additional cash flow to sustain the corporation and provide a future source of funds for growth.”

- Canyon Resource Corp, September 2005 Quarterly Report

Shocks to capital markets driven by the 2008-2009 financial crisis affected the financial flexibility of firms by restricting access to external capital, highlighting the need for better understanding of how firms respond to financing constraints. Based on Keynes (1936), firms are concerned about shocks to external capital as these shocks may impact real investments. Therefore, in a world with market frictions, firms that are limited in obtaining external financing for investments may pass up good investments to the detriment of firm value. These firms that have limited or restricted access to the external capital markets are considered to face financing constraints. Previous empirical studies of financing constraints have focused primarily on the measurement of financing constraints and the cross-sectional differences between financially constrained and unconstrained firms. Generally, as these studies have taken the level of financing constraints of a firm as given, there are few studies on how firms can manage and alleviate their own constraints.

As indicated in the above quote from the September 2005 quarterly report of Canyon Resource Corporation, one channel through which firms could potentially alleviate their own financing constraints is mergers and acquisitions. Lewellen (1971) discusses the advantage of mergers based on financial or capital structure synergies and Chatterjee (1986) finds that mergers based on financial synergies generate more value than those based on operational synergies. Cornaggia and Li (2019) show that firms from states with less access to bank finance target firms from states with more access to bank finance, supporting the idea that financial synergies could emerge from targets. This paper examines the effectiveness of mergers in alleviating constraints by asking whether acquisitions can ease financing constraints for the acquirer. Indeed, Lewellen (1971) states that for financial benefits of mergers to exist there must either be a market imperfection or a firm with suboptimal capital structure (p. 525). As both conditions exist with financially constrained firms, this suggests that firm structure and acquisitions is useful for investigating the alleviation of financing constraints.
There is a natural time series component to firm-level financing constraints that is driven by changes in the macro-economy which impacts the availability of external capital. Changes to the supply of capital may affect firm financing constraints through the willingness of markets to fund particular industries or types of firms (Stein, 1997; Opler, Pinkowitz, Stulz, and Williamson, 1999; and Campello, 2002). Moreover, time variation in firm financing constraints could, in part, be driven by a firm’s ability to manage its own financing constraints along with its own cash flow sensitivities. With lack of access to external capital, firms may be restricted in their first-best source of financing and, as a result, from their first-best level of investment (Fazzari, Hubbard, and Petersen, 1988). That is, they either forego positive NPV projects or engage in disproportionately costly activities to fund these projects.

The adverse impact of firms facing financing constraints is even more severe during financial crises. For instance, during the 2008-2009 financial crisis firms made deep cuts in investment, burned through more cash, drew more credit from banks, and engaged in more asset sales (Campello, Graham, and Harvey, 2010; Campello, Giambona, Graham, and Harvey, 2011; and Ivashina and Scharfstein, 2010). Easing financing constraints and improving access to external capital markets allow firms to invest in valuable projects even during times of otherwise rationed external capital. This paper goes beyond the time series changes in financing constraints and specifically investigates acquisitions as a potential means of alleviating financing constraints for the acquirer.

It may seem counterintuitive that a constrained firm can acquire and the initial response may be that the firm is unconstrained. Here, two points should be emphasized. First, our definition and measures for financing constraint rely on the firm’s ability to access external financing, not necessarily that firms do not have funds to use or do not make investments. Indeed, one main implication from Almeida, Campello, and Weisbach (2004) is the firm’s propensity or sensitivity to save cash from cash flows when expecting to be constrained and unable to access external markets. Second, our measures for financing constraints are continuous, allowing the degrees of being financially constrained to be measured rather than an absolute binary interpretation. While there exist firms in the tails of the distribution that are unambiguously constrained or unconstrained, most firms fall into the more or less constrained spectrum. That is, the expectation of being constrained may be sufficient to motivate firms into precautionary and preventative behavior.
Given that firms may take actions to reduce constraints, it is worthwhile to investigate whether acquisitions alleviate financing constraints for the acquirer itself. Erel, Jang, and Weisbach (2015) show that constrained targets improve their financing constraint status when acquired by an unconstrained acquirer. This study examines whether constrained acquirers themselves are able to improve their financing constraint status through mergers and acquisitions. Take, for example, the case of the financially constrained drugstore.com that acquired Salu, Inc. Though a small private company, Salu, Inc. enjoyed 95 percent revenue growth prior to the acquisition, with net income larger in magnitude than that of its much larger acquirer. Interestingly, the two companies have no plans to merge operations or locations, suggesting a financial, rather than operational, incentive to merge for drugstore.com.

To examine the overall question of whether acquisitions could affect the degree of financing constraints, the paper first studies the persistence of constraints and the relation between firm structure and financing constraint status. The results confirm that financing constraint status changes across time, on average, taking between four to eight quarters. This finding is supported by Erel, Julio, Kim, and Weisbach (2012) and McLean and Zhao (2014) who show that the raising of external capital changes over the business cycle. Next, consistent with Dimitrov and Tice (2006), we find that diversified firms are less constrained than single-segment firms. Additionally, among diversified firms, those whose operations are more focused in their main industry face more financing constraints than those that are less focused. The implication of this evidence is that acquisitions are a potential channel through which financing constraints are alleviated.

The paper then investigates the impact of acquisitions on financing constraint using merger and acquisition events. As a sensibility check, constrained firms should be more likely to use undervalued equity due to the lack of cheaper financing. This is supported by the analysis and suggests that acquisitions by constrained acquirers are driven by financing constraints, and not market timing. Furthermore, the results show that constrained acquirers are more likely to target firms that are less constrained and have higher excess cash relative to assets than themselves. The results also suggest that focused constrained firms are more likely to make diversifying acquisitions than focused unconstrained acquirers.

1http://www.bizjournals.com/sacramento/stories/2009/12/28/daily6.html
Next, the study examines the pre- and post-acquisition level of financing constraints in acquiring firms. We perform a propensity score match to isolate actual acquirers and potential acquirers based on the determinants of being an acquirer. These are a set of characteristics, including financing constraints, that predict the likelihood of being an acquirer. The propensity score matching procedure and related algorithms have been used in prior literature to identify control groups for testing a treatment effect (see, e.g., Aggarwal, Erel, Stulz, and Williamson, 2009; Almeida, Campello, Laranjeira, and Weisbenner, 2011; and Bartram, Brown, and Stulz, 2012). Specifically, the treatment group is comprised of firms actually making an acquisition and the control group is comprised of firms with similar characteristics as the actual acquirers but did not undergo an acquisition.

The results show that acquirers constrained one year prior to acquisition realize a statistically significant improvement in financing constraints post-acquisition. This reduction in constraints is significantly greater than that experienced by the matched, non-acquiring, constrained firms. In contrast, there is an increase in financing constraints for unconstrained acquirers relative to their matched, unconstrained non-acquirers following the acquisition. These results are robust to explicitly controlling for the size of the target, as size is an important determinant of financial constraints, through use of a placebo test using withdrawn acquisitions, and across alternative measures of financing constraints. Moreover, we find that the reduction in constraints is greater for acquiring firms than for matched firms that do a seasoned equity offering (SEO) and keep the proceeds as well as for the first acquisition of serial acquirers than subsequent ones or acquisitions by single acquirers, confirming that acquisitions is an effective and rational strategy for reducing constraints. Furthermore, the improvement in constraints for constrained acquirers over their matched, constrained non-acquirers are more pronounced for diversifying acquisitions than for non-diversifying acquisitions, consistent with a coinsurance effect (Lewellen, 1971). Overall, the findings support the idea that acquisitions can alleviate financing constraints for constrained acquirers.

If financing constraints are alleviated post-acquisition, change should be reflected in corporate decision making along at least three dimensions: use of external capital, investment activity, and

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2 According to Lewellen (1971), firms may benefit from a coinsurance effect by acquiring business segments that allows segments with less correlated cash flows to insure each other.
management of internal liquidity. The alleviation of financing constraints through acquisitions should lead to increased use of external capital in the post-acquisition period. We find that constrained acquirers issue more debt post-acquisition relative to matched, constrained non-acquirers, while there is evidence of a decrease in debt issuance for unconstrained acquirers relative to unconstrained non-acquirers. The increase in external debt is robust to using increases in long-term debt issuances on the statement of cash flow or directly measuring new debt issuances, providing evidence of improved access to capital markets post acquisition.

Additionally, constrained firms that loosen constraints may increase investment as they become better able to fund valuable projects. The results show that constrained acquirers see increases in investments post-acquisition relative to matched constrained non-acquirers, while, again, the opposite is true for unconstrained acquirers relative to unconstrained non-acquirers. These findings support the idea that acquisitions lead to real improvements in financing constraints for pre-acquisition constrained firms relative to constrained, non-acquiring firms and unconstrained acquiring firms, resulting in improved ability to finance investments.

Next, we investigate the management of a firm’s liquidity position by examining the firm’s cash holding post acquisition. Opler, et al (1999) find that financially constrained firms have incentives to engage in precautionary savings and Almeida, Campello, and Weisbach (2004) argue that managers who believe the firm will be more constrained in the future will save more cash out of the firm’s cash flow in order to fund future investment. Suggestive of loosening financing constraints and therefore less need for liquidity preservation, we observe a reduction in cash holdings for constrained acquirers post acquisition relative to their matched non-acquiring firms as well as when compared to unconstrained acquirers relative to their matched firms.

Finally, if acquisitions by constrained firms alleviate financing constraints and lead to increases in real investment, then these improvements should translate into increased firm value. As such, we examine investor reaction to these acquisitions and find that constrained acquirers realize larger abnormal returns in the $-1/1$ days around acquisition announcement than unconstrained acquirers. In addition, the diversification discount – in which mergers between acquirers and targets in different industries see a drop in returns following announcement – exists for unconstrained firms, but does not exist for constrained firms. This suggests that diversification offers benefits for
alleviating financing constraints that are valued by investors.

The paper adds to the literature on acquisitions and financing constraints in several areas. There is a link between firm structure and financing constraints in that changing firm structure could ease constraints. Stein (1997) argues that diversified firms that are financially constrained in their main industry may have business segments in alternative industries that are unconstrained, allowing them to access funds through the unconstrained channels which is supported by the findings in Campello (2002) and Hubbard and Palia (1999). Therefore, diversified firms should be less constrained than focused firms (e.g., Lewellen, 1971; Duchin, 2010; and Hann, Ogneva, and Ozbas, 2013), which is particularly important during crises as shown in Jang (2016), Kuppuswamy and Villalonga (2015), and Dimitrov and Tice (2006).

Bridging a gap in the literature, this paper examines the importance of financial synergies in acquisitions for the acquirer and the possibility of firms using acquisitions to alleviate their own constraints. Erel, Jang, and Weisbach (2015) find that a constrained target becomes less constrained after being acquired by an unconstrained firm. The argument is similar to the theory of liquidity mergers developed in Almeida, Campello, and Hackbarth (2011) where financially distressed firms in an industry are acquired by liquid firms to fund profitable investments. In contrast, this paper focuses on the acquirer being the constrained firm and the acquisition easing the acquirer’s own financing constraints, especially among diversifying acquisitions. Related, Cornaggia and Li (2019) find that firms with better access to bank financing are more likely to be targets of firms with worse access to bank financing, consistent with the attractive target hypothesis.

Harford (1999) shows that firms with high cash holdings tend to make value destroying acquisitions using their excess cash holdings. On the other hand, Almeida, Campello, and Weisbach (2004) argue that firms expecting to be constrained and rationed out of the external market in the future will save cash out of cash flow in order to use internal cash to fund investment. Additionally, Faulkender and Wang (2006) and Denis and Sibilkov (2010) show that cash holdings of constrained firms have a higher value than cash holdings of unconstrained firms. This paper finds that financing constraints are positively correlated with cash holdings (and negatively correlated with excess cash holdings), consistent with Almeida, Campello, and Weisbach (2004). Furthermore, though these firms hold cash, we find that these acquisitions are value enhancing, consistent with the relation
between cash and value of investments in constrained firms as in Faulkender and Wang (2006) and Denis and Sibilkov (2010).

Finally, the loosening of financing constraints has real impacts on firm financing, investment, and performance. Smith and Kim (1994) argue that acquisitions between high cash flow firms and low cash flow firms are value-enhancing, in contrast to the value-destroying acquisitions between firms that are both high cash flow or both low cash flow. The paper links the alleviation of financing constraints through acquisitions with an increase in the use of external capital and firm investment and a decrease in cash holdings. Furthermore, we find a positive investor reaction to constrained firms engaging in actions that alleviate their financing constraints and the disappearance of the diversification discount for constrained acquirers.

2 Financing Constraint Measures and Data Construction

One of the main challenges in any study of financing constraints is measurement of the unobservable constraints. Current literature provides several measures for financing constraints. As each of these measures capture different aspects of financing constraints, in this paper, we use a composite of the existing measures. This will allow us to robustly measure the financing constraint status of a firm while remaining agnostic on the best measure for financing constraints.

2.1 The Financing Constraint Measure

We start with the Whited and Wu (2006) index and Hadlock and Pierce (2010) size-age index. Whited and Wu (2006) provide a structural approach to financing constraints and develop an index of firm characteristics that are related to a firm being financially constrained. Hadlock and Pierce (2010) group firms into financing constraint categories based on qualitative information collected from annual reports. Their paper concludes that firm size and firm age are the two characteristics that are more related to being financially constrained while being less likely to be endogenous. Appendix A provides detailed descriptions on the construction of the Whited and Wu (WW) and Hadlock and Pierce size-age (HPSA) financing constraint indices.

Farre-Mensa and Ljungqvist (2016) show that firms classified as being financially constrained based on existing measures may not be truly constrained based on their financing behavior. The paper’s definition of constrained assumes no access to external capital or an insurmountable wedge between internal and external capital. The goal of this paper is to examine relative constrainedness across firms and across time, rather than absolute strict states.
In order to take advantage of the unique information contained in each index, we create a composite measure using both the Whited and Wu index (WW) and the Hadlock and Pierce size age index (HPSA). In addition, having a credit rating has been shown to be an important determinant of access to financing (e.g., see Kisgen, 2006 and Faulkender and Petersen, 2006). Hence, we also incorporate the credit rating status of the firm into our composite measure.

To construct the composite measure, we first construct the WW index and sort firms into five equal-sized rank bins from 0 to 4 on a quarterly basis, defined as WW5. This procedure is repeated on HPSA by constructing the HPSA index and sorting firms into five equal-sized rank bins on a quarterly basis, defined as HPSA5. Next, firms are sorted based on their credit rating status into three rank bins, CR3, defined below:

$$\text{CR3}_{i,t} = \begin{cases} 
0, & \text{hasInvGrLTCR}_{i,t} = 1 \text{ or hasInvGrSTCR}_{i,t} = 1 \\
1, & \text{if} \ (\text{hasInvGrLTCR}_{i,t} = 0 \text{ and hasInvGrSTCR}_{i,t} = 0) \text{ AND} \ (\text{hasLTCR}_{i,t} = 1 \text{ or hasSTCR}_{i,t} = 1) \\
2, & \text{if} \ hasLTCR_{i,t} = 0 \text{ and hasSTCR}_{i,t} = 0 
\end{cases} \tag{1}$$

where hasLTCR is an indicator variable that takes the value 1 if the firm has a S&P long-term debt credit rating and 0 otherwise, hasSTCR is an indicator variable for whether the firm has a S&P commercial paper credit rating, hasInvGrLTCR is an indicator variable for whether the firm has an investment-grade S&P long-term debt credit rating, and hasInvGrSTCR is an indicator variable for whether the firm has an investment-grade S&P commercial paper credit rating. CR3 is defined such that higher values of CR3 translate to higher degrees of being financially constrained for consistency with WW and HPSA.

Finally, we add all three rank measures together to define a composite measure, FC5:

$$\text{FC5}_{i,t} = \text{WW5}_{i,t} + \text{HPSA5}_{i,t} + \text{CR3}_{i,t} \tag{2}$$

where WW5 is the quintile based on the Whited and Wu (2006) index, HPSA5 is the quintile based on the Hadlock and Pierce (2010) size-age index, and CR3 is the credit rating classification defined of complete (un)constrainedness. For this purpose, existing measures of financing constraints have been shown to capture firms with characteristics consistent with being more or less constrained.
above in equation (1). Summing the rankings based on the three measures, rather than summing the three measures directly, allows us to give equal weight to each of the three measures, which differ in scale. FC5 takes on values ranging from 0, the least financially constrained firms, to 10, the most financially constrained firms. This composite measure has the advantage of using the ranking of all three measures (WW5, HPSA5, and CR3) to arrive at the ultimate ranking of firms. That is, we can categorize a firm which ranks high in WW5, HPSA5 and CR3 as financially constrained with more confidence than a firm that ranks high in only one of these measures.

Approximately 5.8% of the sample are classified as FC5=0 (least constrained) and 15.6% of the sample are classified as FC5=10 (most constrained). In order to be able to sort firms into bins of relatively equal size and to be better able to compare the relative constraint status between firms, we create a continuous version of the measure, FC5Pred, by estimating the following equation:

$$FC5_{i,t} = \alpha_0 + \alpha_1 WW_{i,t} + \alpha_2 HPSA_{i,t} + \alpha_3 \text{hasLTCR}_{i,t} + \alpha_4 \text{hasSTCR}_{i,t} + \alpha_5 \text{hasInvGrLTCR}_{i,t} + \alpha_6 \text{hasInvGrSTCR}_{i,t} + \varepsilon_{i,t}$$

and calculating predicted values:

$$FC5\text{Pred}_{i,t} = \hat{\alpha}_0 + \hat{\alpha}_1 WW_{i,t} + \hat{\alpha}_2 HPSA_{i,t} + \hat{\alpha}_3 \text{hasLTCR}_{i,t} + \hat{\alpha}_4 \text{hasSTCR}_{i,t} + \hat{\alpha}_5 \text{hasInvGrLTCR}_{i,t} + \hat{\alpha}_6 \text{hasInvGrSTCR}_{i,t}$$

(3)

where WW is the Whited and Wu (2006) financing constraint index, HPSA is the Hadlock and Pierce (2010) size-age index, hasLTCR (hasSTCR) is an indicator for whether the firm has a S&P long-term debt (commercial paper) credit rating, and hasInvGrLTCR (hasInvGrSTCR) is an indicator for whether the firm has an investment-grade S&P long-term debt (commercial paper) credit rating. We focus on our predicted composite measure, FC5Pred, as our main measure for financing constraints. In unreported analysis, we repeat all analysis using WW, HPSA, and FC5, individually, and all results hold. The choice of financing constraint measure does not affect our results. Altogether, the measure, FC5Pred, provides us with firm-specific financing constraints that vary both cross-sectionally and over time.
2.2 Corporate Financial Statement Data

We use quarterly data to construct our financing constraint variable, FC5Pred, as detailed above. Corporate financial statement data comes from the Standard & Poor’s Compustat North American quarterly database from fiscal years 1985 to 2018. All dollar amounts are chained to 2004 dollars using CPI to adjust for inflation.\footnote{We chain to 2004 dollars for consistency with the construction of HPSA, which is chained to 2004 dollars as described in Hadlock and Pierce (2010) and Appendix A.} We remove any firms with negative book asset value, market equity, book equity, capital stock, sales, dividends, debt, and inventory. Such firms have either unreliable Compustat data or are likely to be distressed or severely unprofitable. In addition, we delete observations in which book assets or sales growth over the quarter is less than -1 and remove firms with book or market values less than $5 million in 2004 dollars to remove observations that are sensitive to changes due to small asset bases. Next, outliers, defined as firm-quarter observations that are in the first and 99th percentile for all relevant variables used in our analysis, are eliminated from the sample. We also remove all firms in the financial and insurance, utilities, and public administration industries as they tend to be heavily regulated.

Requiring the resulting sample to contain non-missing observations for the main financing constraint measure, FC5Pred, produces a sample of 17,266 unique firms spanning 519,031 firm-quarters from fiscal years 1985 to 2018. Panel A of Table provides the summary statistics for the various constraint measures along with firm characteristics that are relevant for the study. The summary statistics for WW and HPSA are similar to those used in other studies using a similar sample (e.g., Almeida, Hsu, and Li, 2013). Approximately 18.3% of the sample has credit ratings. Half of the sample with long-term credit ratings are investment grade, while almost all of the sample with commercial paper credit ratings are investment-grade. Firm size is skewed as in other studies and not surprisingly the typical firm does not pay dividends and has no reported research and development (R&D) expense.

To examine the quality of our main financing constraint measure, FC5Pred, we examine its correlation with other financing constraint measure as well as firm characteristics commonly associated with financially constrained firms. In Panel B of Table we find that FC5Pred correlates over 90% with WW, HPSA, and FC5. Reassuringly, firms with higher payouts, dividend payments, and credit ratings are less financially constrained. In addition, constrained firms tend to hold more
cash, consistent with saving cash in anticipation of being constrained in the future (Opler, et al, 1999 and Almeida, Campello, and Weisbach, 2004). To distinguish between regular cash holdings and excess cash, we calculate excess cash holdings as in Opler, et al (1999). The results show that despite holding more cash than unconstrained firms, constrained firms have less excess cash than unconstrained firms.

### 2.3 Evolution of Financing Constraints and Firm Structure

Before examining the impact of acquisition on constraint status, it is useful to investigate the time variation of financing constraints and the relation between constraints and firm structure. Firm financing constraints may change across time driven by the external, macro environment, as well as by internal, firm-specific, conditions. If firm-specific financing constraints change across time, the changes could be driven by firm level actions and firm structure. This section validates that constraints change across time and are related to firm structure.

#### 2.3.1 Timing and Persistence of Financing Constraints

To study the persistence of financing constraints, we sort firms based on FC5Pred into terciles each quarter and compute the time it takes for a firm to move from one tercile of financing constraints to another. A change of -1 (+1) indicates that a firm moved into the next lower (higher) tercile and has become relatively less (more) financially constrained as compared with other firms that quarter. A change of -2 (+2) indicates that a firm moved two terciles lower (higher), becoming substantially less (more) constrained. Panel A of Table II calculates the number of quarters it takes for each change to occur and calculate the number of changes, the mean, median, and maximum number of quarters by firm. Approximately 13.0% of the firms in an average quarter change bins, with the average firm switching 7.7 times over the sample period, taking 6.5 quarters on average, 4.5 quarters at the median, and 18.0 quarters at the maximum. To further examine the persistence of constraints, in unreported results, we sort firms into financing constraint quintiles and deciles. The results show that over 20% of firms in an average quarter switch quintiles and approximately 40% switch deciles, further supporting the level of movement in constraints over time. All in all,

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5In unreported analysis, we repeat this procedure for WW and HPSA, we find that on average firms change terciles slightly faster (slower) using WW (HPSA) than using FC5Pred. This is not surprising given that FC5Pred is a composite of WW, HPSA, and credit rating status.
the results suggest that firms do change their financing constraints over time relative to each other, and, in general, take under two years to switch terciles for the average firm.

2.3.2 Firm Structure

Next, we examine the structure of the firms and whether being more diversified matters for financing constraints. Single-segment firms that are in financially constrained industries should have a difficult time accessing needed capital and will remain constrained. On the other hand, multi-segment firms in which their main industry is financially constrained may have business segments in other industries that are un- or less constrained, allowing the firm to access funds through the less constrained segments and alleviating their constraints. Hence, one would expect diversified firms to be less constrained than focused firms, in general.

We obtain corporate segment data from Standard & Poor’s Compustat Segment database from 1985 to 2018 and merge this to our main sample discussed above. Firms with no segment data are assumed to be single segment firms. We construct three measures to capture the idea of being a diversified firm. First, isDiverse is an indicator variable for being a diversified firm that takes the value 1 if a firm has more than one distinct 3-digit SIC (SIC3) business segment. Otherwise, the firm is classified as a focused or single-segment firm and isDiverse has a value of 0. Second, nDistSeg is the firm’s actual number of distinct SIC3 business segments. Third, although some firms may report several distinct business segments, they may have an overwhelming majority of their business in one particular industry, operating like a focused firm. To account for this possibility, we create a Herfindahl-Hirschman index of segment concentration weighted by the sales of each business segment, HHI_Seg. A higher HHI_Seg indicates that the firm is more focused than a firm with a lower HHI_Seg. As such, 1-HHI_Seg is the third measure for a diversified firm. In addition, industry financing constraint measures are calculated by taking the average financing constraint measures in each quarter across all firms in the same SIC3 industry. This measures whether an industry is constrained or not, allowing us to control for industry trends in financing constraints faced by a firm.

To examine whether diversified firms are more or less constrained than focused firms, we run
the following regression:

$$\text{FC5Pred}_{i,t} = \alpha_0 + \alpha_1 \text{DiverseVar}_{i,t} + \gamma_i + \gamma_{yr} + \gamma_{qtr} + \varepsilon_{i,t}$$ (4)

where we use isDiverse, nDistSeg, and 1-HHI_Seg as our diversification variable, DiverseVar. We include firm fixed effects to capture firm invariant factors and both year and quarter fixed effects to control for time varying macro-economic factors and seasonality that may impact the results. Standard errors are clustered by firm.

Panel B of Table II present the results. Columns (i) through (iii) present the results for whether the firm is diversified (isDiverse), the number of distinct segments (nDistSeg), and the Herfindahl-Hirschman index in the direction of being diversified (1-HHI_Seg), respectively. Column (iv) uses 1-HHI_Seg in the sub-sample of diversified firms, i.e., firms that have 2 or more business segments. This checks whether the effect of 1-HHI_Seg in column (iii) is driven entirely by single-segment firms and whether our segment concentration measure has explanatory power among diversified firms. Consistent with our hypothesis, the results show that diversified firms, firms with more distinct 3-digit SIC segments, and firms that are less concentrated in any one segment have lower financing constraints than focused firms, firms with fewer distinct segments, and firms that are more concentrated in any one segment.

Next, we explore whether firms whose primary 3-digit SIC industries are constrained are more likely to benefit from being diverse than firms whose primary industries are unconstrained. MainSIC3_FC is the average FC5Pred for firms within the same main SIC3 industry. We interact MainSIC3_FC with our DiverseVar and run the following regression:

$$\text{FC5Pred}_{i,t} = \alpha_0 + \alpha_1 \text{MainSIC3_FC}_{i,t} + \alpha_2 \text{DiverseVar}_{i,t} \times \text{MainSIC3_FC}_{i,t} + \gamma_i + \gamma_{yr} + \gamma_{qtr} + \varepsilon_{i,t}$$ (5)

with firm, year, and quarter fixed effects and standard errors clustered by firm. Due to including firm fixed effects and the very high multicollinearity between the diversification measures and their interaction terms, we remove their direct effects from our specifications.

The results are shown in columns (v) through (viii) in Panel B of Table II. First, we expect that firms in constrained main industries are more likely to be constrained. This is confirmed by
the positive and significant coefficient on MainSIC3.FC in all columns. Second, we expect that firms in more constrained main industries benefit more from being diversified than firms in less constrained main industries. Indeed, we see that the coefficient on the interaction term, $\alpha_2$, is negative and significant in all columns. Taken altogether, these results support the hypothesis that firm structure is important to financial constraints and motivate the idea that firms can alleviate being financially constrained by being diversified.

3 Acquisitions and Changes in Financing Constraints

The previous sections show that diversified firms have lower financing constraints, particularly for firms where their main industries are constrained. Additionally, we observe that constrained firms tend to hold more cash but have less excess cash than unconstrained firms. Li, Taylor, and Wang (2016) argue that constrained firms may make acquisitions, even using undervalued equity to acquire valuable synergies. This suggests that firms may be able to use acquisitions to ease their financing constraints through the benefit of financial synergies. In this section, we turn to our main research question and study whether corporate decisions of mergers and acquisitions can alleviate financing constraints. The goal is not to argue that easing financing constraints is the only motivation for undergoing acquisitions nor that the only way to alleviate constraints is through acquisitions, but instead to show that acquisitions can alleviate constraints for the acquiring firm.

Our mergers and acquisitions data comes from Thomson Reuters SDC database and includes all U.S. merger and acquisition events from fiscal years 1985 to 2018. Only successful deals with effective dates within 180 days of the announcement date are included. Furthermore, we restrict our M&A sample to include only events in which an acquirer is involved in one event within a centered four year window (i.e., no other M&A events two years before and two years after the current event). This allows us to follow acquirers two years out as cleanly as possible and ensure current firm characteristics are not influenced by previous events.

We merge this sample to our main sample described in Section 2 by the announcement date of

\footnote{Over 95\% of the successful acquisitions have effective dates within two quarters of the announcement dates and over 85\% have effective dates within one quarter of the announcement dates.}

\footnote{For robustness, we remove this restriction. Our results are qualitatively similar and in some cases stronger due to higher power from more observations. In other words, we have placed ourselves under the harsher and cleaner restriction.}
the deal and by acquirer CUSIP to obtain a sample of acquirer-merged-only transactions, resulting in 7,786 events from 1985 to 2018 with non-missing financial constraints data. We sort firms based on FC5Pred each quarter and classify firms to be constrained if they are in the top tercile for FC5Pred and unconstrained if they are in the bottom tercile. For ease of exposition, where the discussion refers to constrained and unconstrained firms, conceptually this is capturing firms that are more constrained versus firms that are less constrained relative to the median firm. It is important to point out that the cutoffs are based on the main sample described in Section 2, rather than the merged M&A sample, to keep the definition of unconstrained and constrained consistent across samples. Overall, there is decent balance between unconstrained acquirers (43.6% of the sample) and constrained acquirers (26.7% of the sample), with slightly more unconstrained than constrained acquirers. The results using the other financing constraint measures (WW, HPSA, FC5) are qualitatively similar.

3.1 Method of Payment for Constrained Acquirers

First, one potential concern is the ability of a firm with financing constraints to make an acquisition. A firm faces financing constraints if it is not able to use its first best source of financing, i.e., financing that allows the firm to invest at first-best levels. Given the diluting effect of issuing new equity and documented decline in returns following seasoned equity offerings, using undervalued equity is particularly costly for acquirers. All else equal, an acquirer should prefer using cash (either existing cash holdings or raising cash through debt issuances) to acquire. Since financially constrained acquirers are unable to issue debt to raise the cash necessary for acquisitions, we expect a constrained acquirer to be more likely to use shares to make the acquisition, even undervalued shares.

To examine this possibility, we run a logistic regression using the sample of acquirers with merged financial statement information to predict the likelihood of using shares as the payment

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8The implicit assumption in this statement is as long as the net benefit to doing the M&A exceeds the cost to using undervalued stock.
method in a M&A event:

\[
Pr(\text{isShares} = 1)_{i,t} = \alpha_0 + \alpha_1 \text{Acq}_\text{FC5Pred}_{i,t-4} + \alpha_2 \text{DealVal}/\text{Acq}_\text{TA}_{i,t-4} \\
+ \alpha_3 \text{Acq}_\text{LnTA}_{i,t-4} + \alpha_4 \text{Acq}_\text{BTM}_{i,t-4} + \epsilon_{i,t}
\]  

(6)

with controls for the firm’s financing constraint measure one year prior to the bid announcement (\text{Acq}_\text{FC5Pred}), the ratio of the value of the bid to the acquirer’s book assets one year prior as a measure for the size of the acquisition and the importance of the deal to the acquirer (\text{DealVal}/\text{Acq}_\text{TA}), the natural log of acquirer’s book assets one year prior (\text{Acq}_\text{LnTA}), and the book-to-market ratio of the acquirer one year prior (\text{Acq}_\text{BTM}). Standard errors are double clustered by acquirer and quarter as recommended in Petersen (2009).

The results of this analysis are shown in Table III. Column (i) of the table uses all observations from the sample of acquirers merged with Compustat. The results indicate that firms are less likely to use stock as a method of payment in general and more likely to use stock for larger acquisitions. Importantly, firms that are more financially constrained are more likely to use stock to fund acquisitions than firms that are less constrained. In column (ii), we focus on the sub-sample of firms that have undervalued equity, \text{isUnderVal} = 1. We define firm misvaluation using the firm-specific error based on the Rhodes-Kropf, Robinson, and Viswanathan (2005) decomposition of the market-to-book ratio into three components: firm-specific error, time-series sector error, and long-run market-to-book. A firm is defined to be undervalued if it has a negative firm-specific error based on the Rhodes-Kropf, Robinson, and Viswanathan (2005) decomposition. Column (ii) shows that, as expected, undervalued firms are less likely to use stock for acquisition. However, undervalued firms are more likely to use stock for acquisitions when they have higher financing constraints.

Finally, in column (iii) we focus on the sub-sample of firms that have overvalued equity, \text{isOverVal} = 1. A firm is defined to be overvalued if it has a positive firm-specific error based on the Rhodes-Kropf, Robinson, and Viswanathan (2005) decomposition. In general, we expect

\footnote{For robustness, we use a simpler, but potentially more naive measure, of misvaluation by taking the difference between a firm’s market equity-to-book equity ratio (MTB) and the median MTB in the firm’s SIC3 industry. A firm is defined to be undervalued if it falls into the lower half among all firms with MTBs less than their median industry MTBs. Similarly a firm is defined to be overvalued if it falls into the upper half among all firms with MTBs higher than their median industry MTBs. All results hold.}
all firms to more likely use equity to finance the acquisitions when that equity is overvalued. As such, we expect financial constraints to have less impact on the decision to use overvalued equity. We find that, on average, firms are no longer avoiding the use of equity when that equity is overvalued. Moreover, firms with higher financing constraints are not significantly more likely to use stock relative to firms with lower financing constraints, consistent with both constrained and unconstrained firms having incentives to use overvalued equity.

Overall, the results in Table III confirm that firms facing financing constraints are more likely to use equity, even undervalued equity, than firms that are less constrained to fund their acquisitions.

3.2 Target Selection of Constrained Acquirers

Since the main focus of the paper is to explore whether acquisitions are effective in alleviating financing constraints for the acquirer, it is useful to ascertain whether constrained acquirers engage in target selection for the purpose of alleviating constraints. Consistent with target selection and the attractive target hypothesis, Cornaggia and Li (2019) find that firms in states with easier access to bank funding are more likely to be targets in acquisitions by firms in states with less access to bank funding. Similarly, if financially constrained firms seek to use acquisitions for loosening their financing constraints, they should potentially target firms that are less constrained, have more liquid assets, or are less correlated than themselves to provide coinsurance.

In order to study the target choice of constrained acquirers, a list of all possible target considerations is needed. As this data of all counterfactuals is not possible, we instead use a sample of completed acquisitions along with withdrawn acquisitions to proxy for firms that the acquirers may have considered as targets. To investigate the characteristics of target firms, a dyadic sample of acquirer-target pairs is merged to Compustat by announcement dates and acquirer and target CUSIPs. The benefit of using this dyadic sample is to allow for examination of the relative firm characteristics between the acquirer and target. However, this drastically reduces the sample as most targets are private and therefore not in the Compustat database. Following previous sample construction, only effective deals in which the acquirer makes one acquisition within a centered four year window are retained. We add to this sample withdrawn acquisitions with available Compustat data to better reflect possible target choices of the acquirers. This process produces a small sample
of 361 acquirer-target pairs with non-missing data.

Table IV runs logistic regressions to examine whether a constrained acquirer is more likely to select a target with lower financing constraints one year prior than itself (isLessFC) in column (i), higher cash flow to assets (hasMoreCF) in column (ii), larger cash holding to assets (hasMoreCash) in column (iii), larger excess cash to assets (hasMoreExcessCash) in column (iv), higher sales growth (hasMoreSalesGr) in column (v), and in a different SIC3 industry (isDiffSIC3) in column (vi). We include firm characteristics one year prior to acquisition for both the acquirer and target as controls: deal value as a ratio to total assets (DealVal/TA), natural log of total assets (LnTA), and book-to-market ratio (BTM).

The results from column (i) show that the target is significantly less constrained than the acquirer. This is supportive of the idea that financially constrained acquirers tend to target firms that are less constrained than themselves. Column (ii) examines the relative cash flows between the target and acquirer. Although statistically insignificant, the positive coefficient on FC5Pred is consistent with acquirers with more constraints targeting firms with higher cash flow to assets. Column (iii) shows that cash holdings to assets are larger, though not significantly so, for targets relative to acquirers. However, in column (iv) we see that acquirers with more constraints do significantly target firms with more excess cash. Column (v) shows that constrained firms more likely to target firms with higher sales growth than themselves, though the result is insignificant.

Finally, given the previous finding in Section 2.3 that diversified firms are less constrained than focused firms, column (vi) investigates whether constrained acquires are more likely to target firms from other industries. To do this we identify whether an acquirer is initially focused or diversified. This serves two purposes. First, there are diminishing returns for diversification. That is, the marginal effect of diversification is strongest for the first diversification and weakens with subsequent diversifications. Second, it is difficult to identify truly diversifying acquisitions as the target may be in a different main SIC3 industry than the acquirer, but within a SIC3 segment of the acquirer. Having identified acquirers that are focused, we interact being focused with whether the acquirer is constrained or not. This interaction term captures the additional likelihood of engaging in diversifying acquisitions for focused, constrained acquirers. The results show that focused acquirers are less likely to make diversifying acquisitions. Interestingly, constrained acquirers appear less
likely to make diversifying acquisitions, contrary to expectations. However, focused, constrained acquirers are more likely to make diversifying acquisitions, though this result is not statistically significant.

Overall, the implications of this analysis show that constrained acquirers may target firms that will help to loosen their financing constraints through targeting firms that are less constrained and have more excess cash. While this analysis is helpful in understanding the types of firms that constrained acquirers are observed to target, there may be unobserved differences in the opportunity set of targets between unconstrained and constrained acquirers that cannot be measured. Moreover, due to data availability, especially for target firms, the small sample size may limit the representativeness of this analysis for broader interpretations.

3.3 The Impact of Acquisitions on the Easing of Financing Constraints

In the previous sections, the analysis shows that financially constrained acquirers are more likely to use undervalued stock to make acquisitions, consistent with being financially constrained, and are more likely to target firms that are less constrained and have larger excess cash holdings than themselves. This section explores the main research question by studying whether constrained firms that make acquisitions actually experience easing of their financing constraints.

To examine the impact of acquisitions on financing constraints, we perform a propensity score matching algorithm to identify potential acquirers with characteristics similar to actual acquirers but did not actually undergo a merger or acquisition. This approach allows for a direct test of the ability of firms to improve their financial constraint status through acquisitions, especially for constrained acquirers. Furthermore, the approach addresses the issue of whether the reduction in financing constraints are driven by characteristics of acquirers that lead to improvement of financing constraints or whether financing constraints are mitigated through the M&A event.

Using the propensity score approach, firms are matched based on the determinants of making an acquisition that is consistent with existing literature (Billett and Xue, 2007; Jordan, Liu, and Wu 2014). In addition, we include the firm’s financing constraints, FC5Pred, in the matching algorithm as easing constraints may motivate constrained firms to make an acquisition. By doing

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10This approach and variations of this approach have been used extensively in the literature. See, e.g., Almeida et al (2011), Aggarwal et al (2009), and Bartram, Brown, and Stulz (2012).
so, we control for financial constraints and ensure we have a set of treatment and control firms that are matched on their constraints. It is interesting to note that the coefficient on FC5Pred is positive and significant, consistent with firms considering their financial constraints in their acquisition decisions. Specifically, more constrained firms are more likely to be an acquirer. The treatment in this propensity score match is whether the firm actually makes an acquisition. We use the nearest neighbor approach with replacement to find the five nearest matches for each acquirer and take averages of the five matched firms. Appendix C details the construction of the propensity score matched sample. This provides us with a sample of actual acquirers (treatment) and their non-acquiring matches with similar characteristics (controls), allowing us to isolate the impact of the acquisition on financing constraints.

3.3.1 Post-Acquisition Reductions in Financing Constraints

Section 2.3 finds, in general, the average and median time it takes for the average firm to switch financing constraints is under two years and about a year for the typical firm. Therefore, firms are followed for 2, 4, 6, and 8 quarters (i.e., up to two years) beyond the (potential) announcement date to observe whether there are changes to firms’ financing constraints. Based on the hypotheses that acquisition enables acquirers to ease their financing constraints, there should be significant improvements in constraints for our actual acquirers relative to the matched (non-acquiring) firms.

Panels A through D of Table V present the results for changes in FC5Pred 2, 4, 6, and 8 quarters post the relevant quarter relative to FC5Pred one year prior to the relevant quarter, respectively. Firms are benchmarked to their financial constraint status one year prior to the announcement date of acquisition to adjust for any information leakage leading up to the announcement of the acquiring bid. Column (i) reports the change in FC5Pred for the actual acquirers and column (ii) reports the change in FC5Pred for the matched non-acquirers. Column (iii) reports the difference in these changes between the actual acquirers and the matched non-acquirers. This difference-in-difference (DID) identifies whether the acquisition leads to an improvement in constraints for acquirers relative to matched non-acquirers. Finally, column (iv) reports the difference in DID between the constrained and unconstrained acquirers. This difference-in-difference-in-difference tests the

\footnote{We repeat this exercise using the nearest neighbor approach without replacement as well as using the single nearest neighbor or the ten nearest neighbors. In all cases, the matched samples show good covariate balance and the results hold.}
significance of the relative changes in constraints between constrained and unconstrained acquirers in comparison to their matched non-acquiring firms. Firms are designated as unconstrained (constrained) if they fall into the bottom (top) tercile when sorted based on FC5Pred one year prior to (potential) acquisition. Recall that the cutoffs are based on the full Compustat sample for consistency in defining constrained and unconstrained. We also examine the difference-in-difference-in-difference results between highly unconstrained and high constrained acquirers. Firms are designated as highly unconstrained (constrained) if they fall into the bottom (top) quintile when sorted based on FC5Pred one year prior to (potential) acquisition. These definitions will remain consistent for the remainder of the paper.

Panel A of Table V presents the results for two quarters post (potential) acquisition. In columns (i) and (ii), we observe significant improvements in financing constraints for both the actual acquirers and the matched firms, regardless of financing constraints, as shown by the reductions in FC5Pred for both constrained as well as unconstrained firms. This is consistent with the idea that financing constraints improve over time in general. Indeed, conditional on a firm surviving and having positive growth, by definition it will be older and, most likely, larger, the two variables comprising the Hadlock and Pierce (2010) size-age index (HPSA).

However, although unconstrained acquirers experience a reduction in financing constraints as evidenced in column (i), they improve significantly less than the matched, unconstrained non-acquirers, as shown in column (iii). Consistent with expectations, it is only within the constrained acquirers that there is a significant (at the 1% level) improvement in financing constraints relative to their matched, constrained non-acquiring counterparts. In other words, only the constrained acquirers experience a significant improvement in financing constraints through acquisition. Finally, column (iv) shows that the difference between the difference-in-differences observed in column (iii) is statistically significant. That is, the alleviation in constraints for constrained acquirers relative to their matched non-acquirers is significantly larger than the alleviation in constraints for unconstrained acquirers relative to their matched non-acquirers between 2 quarters post-acquisition and one year prior to acquisition. These results are corroborated by those for the highly unconstrained and highly constrained firms. In fact, the difference-in-difference-in-difference in the reduction in financing constraints is even more pronounced when comparing between highly
constrained and unconstrained acquirers relative to their matched non-acquiring counterparts.

Panels B through D of Table V repeat the above analysis and examine the changes in financing constraints for 4, 6, and 8 quarters following the (potential) acquisition, respectively, to study whether the improvement in financing constraints continues long after the acquisition. The significance of the improvements in constraints persist at the 1% level for up to eight quarters for the constrained and highly constrained acquirers relative to the matched, constrained non-acquirers. Moreover, the improvements in constraints for constrained acquirers relative to their matched, non-acquiring firms are significantly more than those for the unconstrained acquirers relative to their matched counterparts up to 8 quarters post acquisition, as shown in column (iv) of each panel. These results provide strong evidence in support of the idea that constrained firms can reduce their financing constraints through acquisitions.

3.3.2 Further Support of Post-Acquisition Reductions in Constraints

In the previous section, we have shown that acquisitions can be used to ease financing constraints using a propensity score matching approach that examines the change in financing constraints between constrained and unconstrained acquirers relative to their matched non-acquiring counterparts. One potential explanation for this finding is that financially constrained firms that loosen constraints through acquisitions are those that expect to be unconstrained in the near future. That is, the reduction in constraints is not a result of the acquisition, but were anticipated by management. Almeida, Campello, and Weisbach (2004) argue that firms that anticipate being constrained in the future will save more cash from cash flow than firms that do not expect to be constrained. In our setting, if constrained firms that make acquisitions expect to be unconstrained in the future, they would save less cash from cash flows than matched constrained non-acquirers. We investigate the cash-to-cash flow sensitivity of constrained acquirers and non-acquirers one year prior to the acquisition. The un-tabulated results show no difference in the cash-to-cash flow sensitivities between constrained acquirers and constrained (matched) non-acquirers. Hence, it does not appear that constrained acquirers anticipate future reductions in constraints prior to acquisition, relative to constrained non-acquirers.

3.3.2.1 Placebo Test
To further support the argument that acquisition alleviates financing constraints for constrained acquirers, we run a placebo test using withdrawn acquisitions. Withdrawn M&As are events in which the acquisition is announced but later withdrawn. In other words, the actual acquisition never takes place. If, despite the propensity score matching algorithm, there are still unobserved differences in firm characteristics between actual acquirers and the matched non-acquirers that may drive the change in financing constraints, there should be an improvement for withdrawn acquirers relative to the matched non-acquirers. If the actual completion of the acquisition provides constraint alleviation, then acquirers in withdrawn acquisitions do not experience this benefit and therefore should not experience an improvement in constraints over their matched counterparts.

The bottom of each panel in Table V presents the results for the sample of withdrawn M&A’s. While withdrawn M&A’s do experience alleviation of constraints over time, the constraint reduction is either less than or statistically insignificant from their matched non-acquiring counterparts, regardless of pre-acquisition financing constraints. The results in column (iii) of each panel indicate no improvements in financing constraints for withdrawn acquirers relative to matched non-acquirers for both the unconstrained as well as constrained acquirers. Moreover, the difference-in-difference-in-difference in financing constraints between constrained and unconstrained acquirers relative to their matched counterparts for withdrawn deals is statistically insignificant. These results indicate that withdrawn acquisitions do not benefit from alleviation of constraints. Therefore, it appears that the acquisition itself results in the improvement in financing constraints.

3.3.2.2 Validity Test Using Alternate Measures of Financial Constraints

Having confirmed that it is the act of acquisition itself that improves a firm’s financing constraints, we explore whether our results are sensitive to the measure of financing constraint. As detailed in Section 2.1, we use FC5Pred as our main measure for financing constraints, which is a composite of the Whited and Wu (2006) index, the Hadlock and Pierce (2010) size-age index, and the firm’s credit rating status. These three individual measures are all highly correlated with each other and with FC5Pred, as shown in Panel B of Table I. Yet, for robustness, we repeat our analysis from Table V using the individual Whited and Wu (2006) index and the Hadlock and Pierce (2010) size-age index. We are unable to repeat the analysis using credit rating status since having a credit rating is a relatively time invariant measure. Instead we use the firm’s payout ratio – defined as a
firm’s dividend payment and share repurchases over operating income – as an alternative measure for financing constraints given that it is a firm characteristic commonly linked to constraints in the literature. Specifically, firms with more financing constraints tend to make less payout in order to preserve their liquidity. Moreover, using the payout ratio measure offers the additional advantage of providing external validity as it is a measure not included in FC5Pred.\footnote{For brevity and in unreported analysis, we also confirm our results using the Kaplan and Zingales (1997) index.}

The results are shown in Table VI. For the Whited and Wu (2006) index and for the Hadlock and Pierce (2010) size-age index, firms are classified as unconstrained (constrained) if they fall into the bottom (top) tercile of that index one year prior to M&A. For the payout ratio, firms are classified as unconstrained (constrained) if they fall into the top (bottom) tercile one year prior to M&A. Panels A through D present the results for changes in each alternative measure of financing constraints 2, 4, 6, and 8 quarters post acquisition relative to that financing constraint measure one year prior, respectively. Reassuringly and as expected, the results using Whited and Wu (2006) index and the Hadlock and Pierce (2010) size-age index mirrors those from Table V using FC5Pred. For the payout ratio, we expect alleviation of constraints to translate into increased payouts post acquisition. Indeed, constrained acquirers increase their payout ratios post acquisition in all panels. This increase is statistically significant when compared to their matched non-acquiring counterparts as well as when compared to unconstrained acquirers relative to their matched non-acquirers. Altogether, these results using alternate measures of financial constraints corroborate those observed when using FC5Pred.

3.3.2.3 Relative Size Differentials

Next, as shown in Panel B of Table I and Appendix A, size plays an important role in our composite financial constraint measure as it is a component of both the Whited and Wu (2006) and Hadlock and Pierce (2010) indices, as well as being correlated with having a credit rating. In addition, we have shown that constrained acquirers are more likely to make stock acquisitions. It has been shown in the literature that stock acquisitions are typically relatively larger than non-stock acquisitions. Therefore, our results could be driven by a larger increase in size for constrained acquirers relative to unconstrained acquirers.

To examine this possibility, we measure the relative size differentials for all firms (actual
acquirers and their matched non-acquiring counterparts) by calculating the change in total assets between 2-quarters post-acquisition and one year prior to acquisition as a ratio to total assets one year prior to acquisition. In essence, this controls for the size of the acquirer relative to the target. We sort all firms based on their relative size differentials into halves each quarter. In order to properly compare acquirers and their matched non-acquiring firms, we retain only the observations where the acquirer and its matched non-acquirers sort into the same relative size differential bin.

Table VII repeats the analysis in Table V for the Low Size Change (bottom) and High Size Change (upper) bins. As before, Panels A through D present the results for changes in FC5Pred 2, 4, 6, and 8 quarters post the relevant quarter relative to FC5Pred one year prior, respectively. The results indicate that the difference-in-difference-in-difference in the reduction of financial constraints for constrained acquirers over unconstrained acquirers relative to their respective matched counterparts (column (iv)) is statistically significant at the 1% level in both the Low and High Size Change bins and across all panels. In other words, after controlling for the size differential, constrained acquirers still significantly see reduced financing constraints when compared to unconstrained acquirers relative to their matched non-acquiring firms. In fact, in the High Size Change bin – where both the constrained and unconstrained acquirers realized a large size differential – the constrained acquirers observe even larger reductions in financial constraints relative to unconstrained acquirers than in the Low Size Change bin. This is contrary to expectations if size differentials were the main driver of the reduction in constraints between constrained and unconstrained acquirers. This confirms that the relative reduction in financing constraints observed previously is not driven by constrained firms making larger acquisitions than unconstrained firms.

3.3.2.4 Acquisitions versus SEOs

So far, the results show that firms which face financing constraints and make acquisitions can loosen their constraints through acquisitions. To make these acquisitions, the paper posits that firms may use equity, even undervalued equity, to make these constraint-easing acquisitions. One potential concern is whether firms that undergo a seasoned equity offering (SEO) could simply ease constraints by directly using these proceeds rather than making constraint-easing acquisitions. To examine this possibility, along with our previous matching criteria, we also require that the matched non-acquirer to have undergone a SEO within the same quarter as the acquisition to which it is
matched. This allows for a direct comparison of the easing of constraints between two otherwise similar firms with one having undergone an acquisition and one having undergone a SEO.

The results of this analysis are shown in Table VIII. The results show that unconstrained acquirers realize less of a reduction in constraints relative to matched unconstrained firms that undergo a SEO. This relation persists up to 8 quarters following the acquisition/SEO. For constrained acquirers, relative to constrained non-acquirers that undergo a SEO, we observe opposite results. That is, the constrained acquirer realizes a significantly greater reduction in financing constraints relative to the matched non-acquiring SEO firm up to 8 quarters following the acquisition/SEO. Reinforcing this relation, we see that the difference-in-difference-in-differences are significant at the 1% level for up to eight quarters following the acquisition/SEO.

To further examine the relative impact of the acquisition or SEO in alleviating constraints, we also restrict the acquirers to stock or cash acquisitions as well as restrict the acquirers to having undergone a SEO in the past year. In untabulated results, these analyses support the idea that acquisitions ease constraints for constrained acquirers more than matched constrained firms that do a SEO. Finally, we also restrict the acquirers to having undervalued equity. While this requirement severely reduces our sample, the results support the argument that acquisitions by firms with undervalued equity loosens financing constraints more than firms that simply do a SEO.

3.3.2.5 Single versus Serial Acquirers

Finally, we explore whether there are differences in the ability for acquisitions to alleviate financing constraints for “single” acquirers, those who make only one acquisition in our sample, versus “serial” acquirers, those who make more than one acquisition. If there are diminishing returns to the impact of acquisition on alleviating constraints, then we would expect constraint alleviation to be most pronounced for the acquisitions of single acquirers or the first acquisition of serial acquirers. To study whether our results are primarily driven by acquisitions by single acquirers or first acquisitions of serial acquirers or whether all acquisitions offer the benefit of easing constraints, we partition our sample by acquisitions of single acquirers, first acquisitions of serial acquirers, and subsequent acquisitions of serial acquirers and repeat our main analysis.13

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13Our sample consists of roughly two-thirds single acquirers and one-third serial acquirers. However, approximately half of all acquisitions in our sample are conducted by serial acquirers.
As shown in Table IX, we find that the difference-in-difference-in-difference in the alleviation of financial constraints between constrained acquirers and unconstrained acquirers relative to their respective matched non-acquiring counterparts is significant for all acquisitions of both single and serial acquirers. This suggests that the easing of constraints is not driven by just one type of acquirer and extends beyond just the first acquisition. Furthermore, the easing of constraints appear to be slightly more pronounced for the first acquisition of serial acquirers. There appears to be little or no difference in the alleviation of constraints between acquisitions by single acquirers and subsequent acquisitions of serial acquirers. These results are consistent with the interpretation that the pronounced reduction in constraints for the first acquisition of serial acquirers may encourage them to continue to use acquisitions as a strategy for alleviating further constraints. As a result these initially single acquirers become serial acquirers with subsequent acquisitions resulting in slightly diminished, but still significant, reductions in constraints.

Altogether, the results from the above analysis provide robust evidence that acquisitions can alleviate financing constraints for constrained acquirers.

3.4 Diversifying Acquisitions and the Easing of Financing Constraints

Finally, Section 2.3 finds that diversified firms tend to be less constrained than focused firms, implying that diversifying acquisitions may alleviate financing constraints for constrained firms. The previous analysis on relative characteristics between the acquirer-target pair suggests that focused, constrained acquirers are more likely to select targets in different SIC industries ex-ante. For additional support, it is worthwhile to examine whether diversifying acquisitions lead to more substantial lowering of financing constraints than focused acquisitions ex-post.

Table X investigates this possibility. The propensity score matched sample is partitioned into diversifying and non-diversifying acquisitions. Panels A through D reflect post acquisition changes in constraints for 2, 4, 6, and 8 quarters following acquisition. Consistently across each panel, there are three significant outcomes. First, there is a reduction in financing constraints for both diversifying and focused firms following an acquisition, consistent with the above results. Next, the reduction in financing constraints is significantly more pronounced for constrained acquirers than for unconstrained acquirers for both diversifying and focused acquisitions, also consistent with
the above results. Finally, among financially constrained acquirers, the improvement in financing constraint status is significantly greater for diversifying acquisitions than for focused acquisitions. Altogether, the results provide evidence that diversifying acquisitions provide greater reduction in financial constraints than focused acquisitions, corroborating the finding that diversified firms are less constrained than focused firms.

4 Post-Acquisition Implications for Financing Constraints

If firms are able to loosen financing constraints through acquisitions, then this should translate into real improvements in the firm’s ability to access external financing, make investments, reduce cash savings, and increase firm value. This section investigates improvements in access to external capital, investments, corporate cash policy, and firm performance following acquisitions.

4.1 Post-Acquisition Debt Issuance

With the relaxing of financing constraints, firms should have better access to external financing. To investigate whether the loosening of financing constraints post acquisitions leads to firms making use of their improved access to external financing, we track post-acquisition debt issuances of the treatment and control firms in our propensity score matched sample. Panels A through D of Table XI take the natural log of long-term debt issuance as reported in firm quarterly reports and observe the changes in long-term debt issuance 2, 4, 6, and 8 quarters post acquisition relative to one year prior to acquisition, respectively. As before, column (i) of each panel reports the change in the log of long-term debt issuance for the actual acquirers and column (ii) for the matched non-acquirers. Column (iii) reports the difference in changes between the actual acquirers and matched non-acquirers and the significance of this difference-in-difference. Finally, column (iv) reports the difference in DID between the constrained and unconstrained acquirers.

For unconstrained acquirers, we observe a decrease in long-term debt issuances in the quarters following the acquisition relative to matched non-acquiring firms, significant at 4, 6 and 8 quarters post-acquisition. In contrast, constrained acquirers realize an increase in long-term debt relative to matched non-acquirers following the acquisition. This increase in long-term debt is significant at the 1% level and increasing in magnitude, from a 7.4% increase over matched non-acquirers.
2 quarters post to a 13.8% increase 8 quarters post. This suggests that the acquisition has a long-term effect on financially constrained firms’ ability to access external capital markets. A comparison between the constrained and unconstrained acquirers relative to their matched non-acquirers shows that the constrained acquirers increase their long-term debt by 13.8% relative to matched non-acquirers at 8 quarters after acquisition while the unconstrained acquirers decrease long-term debt by 12.2% relative to matched non-acquirers 8 quarters post, leading to a difference in DID of 26.0%. These results are corroborated by those for the highly unconstrained and constrained firms and are consistent with the previous finding that alleviation of constraints in M&A is enjoyed primarily by the constrained acquirers.

The above results are based on long-term debt issuances as reported by firms on their statement of cash flows. For robustness and in unreported analysis, we also collect data on debt issues from the Thomson Reuters SDC Global Issues database from 1985 to 2018. Total proceeds from debt financing across debt issuances are aggregated by firm-quarter and merged into the propensity score matched sample. The results are consistent with those observed in Table XI, evidencing a differential increase in debt issuance for constrained acquirers over unconstrained acquirers relative to their respective matched counterparts. Altogether, the findings confirm that the relaxing of financing constraints post acquisition by constrained acquirers lead to increases in debt issuance. More specifically, the relaxing of financing constraints documented in the above sections do appear to translate to actual better access to and use of debt markets for constrained acquirers following acquisition.

### 4.2 Post-Acquisition Investments

Financing constraints prevent firms from accessing their first-best source of financing and, as a result, prevent firms from making their first-best level of investment. The relaxing of financing constraints and the increasing use of debt post acquisition among constrained acquirers, evidenced in the previous sections, should have real impact on investments. Defining investments as the sum of capital expenditures and research and development (R&D) expense, this section repeats the previous analysis using the propensity score matched sample by tracking changes in investments post acquisition in Table XII.
Panels A through D of Table XII present the changes in the natural log of investments 2, 4, 6, and 8 quarters post acquisition relative to one year prior to acquisition for the (i) actual acquirers, (ii) matched non-acquirers, (iii) difference-in-difference between actual acquirers and matched non-acquirers, and (iv) difference-in-difference-in-difference. For unconstrained acquirers, there is a reduction in investment in all periods following acquisition. Moreover, unconstrained acquirers decrease investment by 12.4%, 12.1%, 15.1% and 17.1% more relative to unconstrained non-acquirers in the 2, 4, 6, and 8 quarters following acquisitions, respectively. In contrast, for constrained acquirers there is a significant increase in investment 2 and 4 quarters post-acquisition. Although constrained acquirers reduce investment 6 and 8 quarters post-acquisition, when compared to their matched non-acquirers, they reduce significantly less investment, resulting in more investment on net. Specifically, while constrained acquirers are not significantly different from their matched non-acquirers in their investments 2 quarters post-acquisition, constrained acquirers make significantly more investment than their matched non-acquirers, by 8.1%, 12.4%, and 16.5% in the 4, 6, and 8 quarters post-acquisition, respectively. The difference in DID is positive and significant for all periods, as shown in column (iv) of each panel. That is, relative to the unconstrained acquirers, constrained acquirers invest significantly more in relation to their matched non-acquiring firms. As expected, the results are stronger for the highly unconstrained and highly constrained firms.

As before, one potential concern may be that the relative increase in investments for constrained acquirers is driven by larger relative size of acquisitions. In other words, the increase in investment could simply be driven by the size of the target relative to acquirers. For robustness and in unreported analysis, we control for the potential influence of relative size and repeat the approach in Section 3.3.2.3 by partitioning firms based on their relative size differentials into Low Size Change and High Size Change bins. The results are robust to this procedure and we find significant relative increases in investments for constrained acquirers against unconstrained acquirers and their respective matched counterparts among both the Low Size Change and High Size Change bins.

Consistent with the above findings, constrained acquirers can loosen their financing constraints through acquisitions, which results in real improvements in the firm’s ability to make investments post-acquisition, above those observed in the matched non-acquirers. The results are opposite
for unconstrained acquirers who reduce investments relative to their matched non-acquiring firms following acquisition.

### 4.3 Post-Acquisition Cash Holdings

Opler, et al (1999) suggest that firms with ample access to external financing tend to hold lower amounts of cash relative to assets, while financially constrained firms tend to engage in precautionary savings and hold higher amounts of cash. Similarly, Almeida, Campello, and Weisbach (2004) argue that firms that anticipate future financing constraints will have higher cash to cash flow sensitivities due to saving cash out of cash flow to fund future investments. The implication of these studies is that firms that reduce their financing constraints following acquisition should have less need for liquidity preservation due to their improved access to capital markets. In other words, these firms should have less need to hold their prior levels of cash and more likely to reduce their cash holdings post acquisition.

Panels A through D of Table XIII present the change in cash holdings – defined as the cash-to-asset ratio – 2, 4, 6, and 8 quarters post acquisition, respectively, relative to one year prior to acquisition. We find that constrained acquirers reduce their cash holdings by 3.8%, 3.9%, 3.5%, and 3.1% more than their matched non-acquiring firm 2, 4, 6, and 8 quarters post-acquisition, respectively. In contrast, unconstrained acquirers increase their cash holdings by 0.5%, 0.9%, 1.2%, and 1.5% more than their matched counterparts 2, 4, 6, and 8 quarters following acquisition, respectively. This means that the difference in the DID between constrained acquirers and unconstrained acquirers is negative and significant in all periods following acquisition. In other words, constrained acquirers significantly reduce their cash holdings following acquisition relative to unconstrained acquirers and to both of their matched non-acquiring firms, consistent with alleviation of constraints and improved access to external financing. These results provide evidence that the acquisition loosens constraints and reduces the need to save cash.

### 4.4 Firm Performance Following Announcement

Finally, having shown that acquisitions alleviate constraints for constrained acquirers and that this translates into real improvements in use of external capital, increases in investments, and easing of
liquidity preservation, it is informative to examine whether this ultimately improves firm value by examining investor reaction to the acquisition. To evaluate the market reaction to the acquisition, we examine firm performance around the announcement date through an event study. Daily returns and market factors are obtained from the CRSP database from 1984 to 2019 and daily buy-and-hold abnormal returns are estimated for all acquirers in our M&A sample with non-missing returns data. Daily abnormal returns are calculated as actual daily returns net of expected daily returns. Expected daily returns are estimated using the Carhart (1997) four factor model that includes the Fama and French (1993) 3-factors (MKTRF, SMB, HML) and includes a momentum factor (UMD) over a one-year estimation window of [-395,-30] days that allows for news leakage of the acquisition to the market in the 30 days prior to announcement.

Figure 1 shows the buy-and-hold abnormal returns over the [-21,21] day window around the announcement date, benchmarked to day -21, for all acquirers in our M&A sample merged with returns data. On average, there is a 0.71% (or 71 basis point) increase in abnormal returns over the 2 day window that covers [-1,1] days around announcement. By week three, abnormal returns have retraced most of this increase and returned largely to where they were prior to acquisition. Figure 2, Panel A splits acquirers into Constrained and UnConstrained based on sorting FC5Pred into terciles. As before, Constrained (UnConstrained) acquirers are those with FC5Pred in the top (bottom) tercile of FC5Pred one year prior to announcement. The abnormal returns for constrained acquirers are more volatile than for the unconstrained acquirers. In general, unconstrained acquirers have higher abnormal returns than constrained acquirers. However, the increase in abnormal returns over the [-1,1] day window around announcement is larger for constrained acquirers (1.10%) than for unconstrained acquirers (0.54%). This difference is statistically significant at the 10% level.

One implication from previous results is that a diverse firm has lower constraints than a single-segment firm. This suggests that there may be a benefit to diversifying acquisitions for constrained acquirers and these acquirers should see an improvement in firm performance following announcement. On the other hand, existing literature in the M&A literature document a diversification discount from mergers between firms in different industries (e.g., Lang and Stulz (1994), Berger and Ofek (1995)), implying investors find more valuable synergies from mergers between firms within the same industry. This would suggest that diversifying acquisitions would
have a negative effect on firm performance following announcement.

We further split Constrained (UnConstrained) acquirers into those that make a diversifying acquisition and those that do not. Figure 2 Panel B presents the difference in abnormal returns between diversifying and focused acquisitions for constrained and unconstrained firms. Over the [-1,1] day window around announcement, constrained firms that make a diversifying acquisition see an abnormal return of 0.86% higher than constrained firms that make a focused acquisition, suggesting that the market sees value in acquiring a target in a different industry for constrained acquirers. In contrast, over the same period, unconstrained firms that make a diversifying acquisition see an abnormal return of -0.15% relative to unconstrained acquirers that acquire a target in the same industry, indicative of a diversification discount. This difference is statistically significant at the 10% level. This suggests that the diversification discount does not exist (and may possibly point to a diversification premium) for the constrained acquirers. This is consistent with a general improvement in the health of constrained firms following acquisitions, specifically diversifying acquisitions that has the potential to alleviate financing constraints.

5 Conclusion

With imperfect capital markets, firms with financing constraints may have to pass on positive NPV investments as they lack access to external capital markets at reasonable costs. Much of the financing constraints literature assumes that firms are not able to impact their own financing constraint status and changes in a firm’s financing constraints are primarily driven by changes in the external capital markets or changes to the firm’s environment due to the actions of other firms (e.g., being acquired). This paper studies the extent to which acquisitions can alleviate financing constraints for the acquirers.

Using a measure of financing constraints that combines popular measures in the literature, the paper first examines the persistence of financing constraints across time and the relation between firm structure and financing constraints. The paper next investigates the effectiveness of using acquisitions to alleviate financing constraints for the constrained acquirer. The paper finds that acquirers constrained one year prior to acquisition are more likely to use undervalued equity to fund the acquisition. Consistently, constrained acquirers are more likely to target firms that are
less constrained and have larger excess cash holdings relative to themselves. Focused constrained firms are slightly more likely to make diversifying acquisitions than focused unconstrained firms.

Next, using a propensity score matched sample, the results show that constrained acquirers are less constrained from two quarters up to two years post acquisition relative to the matched, constrained, non-acquiring firms. Interestingly, unconstrained acquirers are more constrained relative to their matched, unconstrained non-acquirers post acquisition. These results only exist for completed acquisitions and not for withdrawn ones and robust to several measures of financing constraints. Furthermore, these findings are stronger for diversifying acquisitions than for non-diversifying acquisitions and are not driven by constrained acquirers making larger acquisitions. In addition, there is significantly greater loosening of financing constraints for constrained acquirers relative to matched constrained non-acquirers that do a SEO. This provides robust evidence that acquisition activity eases financing constraints for constrained acquirers.

Finally, the easing of financing constraints post acquisition have real effects for the acquiring firm. Constrained acquirers issue more debt and make more investment post acquisition relative to their propensity score matched, constrained, non-acquirers. Also, constrained acquirers reduce more cash holdings and increase payout relative to their matched, constrained non-acquirers. In contrast, unconstrained acquirers issue less debt, invest less, and save more than their matched, unconstrained counterparts. These results confirm that the observed improvement of financing constraints for the constrained acquirers translate to improved access to external capital, increases in real investment, and less need for liquidity preservation. Finally, the results show that constrained acquirers realize positive abnormal returns to the acquisition and do not experience a diversification discount, in contrast to unconstrained acquirers.

Overall, this paper finds that mergers and acquisitions can be a useful tool in alleviating financing constraints for constrained firms. While alleviation of financing constraints is not the only reason for firms to engage in M&A nor are M&As the only way to reduce constraints, the results highlight the importance of considering financial synergies in mergers and acquisitions.
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Appendix A

Appendix A.1 Whited and Wu Index (WW)

Whited and Wu (2006) provide a structural approach to financing constraints by extending the model introduced in Whited (1992). In Whited (1992) and Whited and Wu (2006), firms optimize their value subject to financing constraints. The Lagrange multiplier on the financing constraint captures the firm’s degree of being financially constrained. Whited and Wu (2006) parameterize the Lagrange multiplier using firm characteristics and estimate its coefficients using generalized method of moments. The resulting Whited and Wu (2006) measure is comprised of an index of firm characteristics that are related to a firm being financially constrained. This index is defined as:

\[
WW_{i,t} = -0.091 \times CF_{i,t} - 0.062 \times DDIV_{i,t} + 0.021 \times LTD_{i,t} - 0.044 \times SIZE_{i,t} + 0.102 \times ISG_{i,t} - 0.035 \times SG_{i,t},
\]

where CF is cashflows over total assets, DDIV is an indicator for a dividend-paying firm, LTD is long-term debt over total assets, SIZE is the natural log of book assets, ISG is the sales growth in the firm’s 3-digit SIC industry, and SG is the firm’s one quarter sales growth. Since this approach proxies for growth opportunities using sales growth relative to industry sales growth, this approach has the additional benefit of avoiding mismeasurement errors in Tobin’s Q (Erickson and Whited, 2000 and 2010). Effectively, the WW index suggests that a firm is financially constrained if it is a slow growing firm in a fast growing industry. The higher the WW index, the more constrained the firm.

Appendix A.2 Hadlock and Pierce Size-Age Index (HPSA)

Hadlock and Pierce (2010) propose a new measure for financing constraints based on the size and age of a firm. The authors follow the approach introduced in Kaplan and Zingales (1997) by collecting qualitative information provided in the annual reports and classifying firms into financial constraint categories. Firms are classified into five groups: not financially constrained (NFC), likely not financially constrained (LNFC), potentially financially constrained (PFC), likely financially constrained (LFC), and financially constrained (FC). Using this classification scheme, ordered
logit models are estimated to determine the impact of firm characteristics on being financially constrained. Among various the firm characteristics that are tested, Hadlock and Pierce (2010) find that firm size and firm age are the two characteristics that appear to be more related to being financially constrained while being less likely to be endogenous. They construct an index using only firm size and age to measure financial constrainedness. This index is defined as:

$$HPSA_{i,t} = -0.737 \times \text{FirmSize}_{i,t} + 0.043 \times \text{FirmSize}^2_{i,t} - 0.040 \times \text{FirmAge}_{i,t},$$  \hspace{1cm} (A.2)$$

where FirmSize is the log of book assets adjusted for inflation using 2004 dollars and replaced with log($4.5\text{billion}$) if the actual value is greater, and FirmAge is the number of years the firm has been on Compustat with a non-missing stock price and replaced with 37 if the actual age is greater. The higher the HPSA index, the more constrained the firm.
Appendix B

Here, we provide detailed descriptions of the variables used in the analysis and variables included in the summary statistics reported in Table I. Abbreviations in parentheses indicate the corresponding Compustat quarterly industrial data items.

| Variable                        | Description                                                                 |
|---------------------------------|----------------------------------------------------------------------------|
| Total Assets                    | Assets - Total (ATQ) * Adjustment to 2004 Dollars                           |
| Mkt Equity                      | Price-Close-Quarter (PRCCQ) * Common Shares Outstanding (CSHOQ) * Adjustment to 2004 Dollars |
| Ln Total Assets (LnTA)          | \( \ln\{\text{Total Assets}\} \)                                        |
| Book-to-Market Ratio (BTM)      | \( \frac{\text{Total Common Equity (CEQQ)}}{\text{Price-Close-Quarter (PRCCQ)} \times \text{Common Shares Outstanding (CSHOQ)}} \) |
| Age                             | Firm’s age in years                                                        |
| Long-term Debt Ratio (LTDebt/TA)| \( \frac{\text{Debt - Long-term - Total (DLTTQ)}}{\text{Assets - Total (ATQ)}} \) |
| Sales Growth (SaleGr)           | \( \frac{\text{Sales/Turnover (Net)} - \ln(Sales/Turnover (Net)) - \ln(Sales/Turnover (Net))}{\ln(Sales/Turnover (Net))} \) |
| Tangibility / TA                | \( 0.715 \times \text{Receivables} + 0.547 \times \text{Inventory} + 0.535 \times \frac{\text{Capital}}{\text{Assets - Total (ATQ)}} \) as defined in Almeida and Campello (2007) |
| Cash / TA                       | \( \frac{\text{Cash and Short Term Investments}}{\text{Assets - Total (ATQ)}} \) |
| Capex / TA                      | \( \frac{\text{Quarterly Capital Expenditure}}{\text{Assets - Total (ATQ)}} \), 0 if missing |

where Quarterly Capital Expenditure is the capital expenditure over the quarter. Compustat Quarterly provides the accumulated capital expenditure over the fiscal year, i.e., Capital Expenditure in quarter 1 is the capital expenditure over quarter 1 and Capital Expenditure in quarter 2 includes the capital expenditure made in both quarters 1 and 2.

| Quarterly Capital Expenditure   | \( \begin{cases} \text{Capital Expenditure (CAPXY)}_t & \text{for } t=1 \\ \Delta \text{Capital Expenditure (CAPXY)}_{t-1,t} & \text{for } t=2 \text{ to } 4 \end{cases} \) |
| R&D / TA                       | \( \frac{\text{Research and Development Expense (XRDQ)}}{\text{Assets - Total (ATQ)}} \), 0 if missing |
| Payout Ratio                    | \( \frac{\text{Total Dividends} + \text{Shares Repurchased (PRSTKCQ)}}{\text{Operating Income (OIBDPQ)}} \) |
| hasDiv                          | \( 1 \) if Total Dividends \( >0 \), 0 otherwise |

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| Variable     | Description                                                                 |
|--------------|-----------------------------------------------------------------------------|
| hasLTDR      | = 1 if S&P long-term debt credit rating is non-missing, 0 otherwise         |
| hasSTDR      | = 1 if S&P commercial paper rating is non-missing, 0 otherwise              |
| hasInvGrLTDR | = 1 if S&P long-term debt credit rating is investment grade, 0 if S&P long-term debt credit rating is not investment grade but non-missing |
| hasInvGrSTDR | = 1 if S&P commercial paper credit rating is investment grade, 0 if S&P Short-term debt credit rating is not investment grade but non-missing |
| isDiverse    | = 1 if Number of distinct 3-digit SIC business segments >1, 0 otherwise     |
| nDistSeg     | = Number of distinct 3-digit SIC business segments                           |
| HHI_Seg      | = Herfindahl-Hirschman index of segment concentration weighted by the sales of each 3-digit SIC business segment, normalized between 0 and 1 |
Appendix C

In order to address the issue of whether financing constraints are mitigated through the M&A event or whether characteristics of acquirers lead to the improvement of financing constraints, we perform a propensity score matching algorithm to identify potential acquirers with similar characteristics to the actual acquirers but did not actually undergo a merger and acquisition.

First, we use our main sample described in section 2 and identify firms that actually acquired in a particular quarter, isAcq=1, and firms that are non-acquirers, isAcq=0. To be considered a non-acquirer, the firm must not have acquired within a four year window centered on the relevant quarter, i.e., within two years on either side of the relevant quarter. This restriction allows us to cleanly track firms over two years. Next, we run the following logitistic regression of isAcq on a set of lagged firm characteristics:

\[
isAcq_{i,t} = \alpha_0 + \alpha_1 \text{SIC3Adj}_{i,t-1} + \alpha_2 \text{ROA}_{i,t-1} + \alpha_3 \text{SIC3Adj}_{i,t-1} + \alpha_4 \text{LnMktEquity}_{i,t-1} + \alpha_5 \text{LnMktEquity}_{i,t-1} + \alpha_6 \text{LTDebt/TA}_{i,t-1} + \alpha_7 \text{Tangibility/TA}_{i,t-1} + \alpha_8 \text{SaleGr}_{i,t-1} + \alpha_9 \text{DivYield}_{i,t-1} + \alpha_{10} \text{SaleGr}_{i,t-1} + \alpha_{11} \text{MTB}_{i,t-1} + \alpha_{12} \text{Tangibility/TA}_{i,t-1} + \alpha_{13} \text{SaleGr}_{i,t-1} + \alpha_{14} \text{DivYield}_{i,t-1} + \alpha_{15} \text{MTB}_{i,t-1} + \alpha_{16} \text{Tangibility/TA}_{i,t-1} + \gamma_i + \gamma_{yr} + \gamma_{qtr} + \varepsilon_{i,t}.
\]

(C.1)

In choosing our list of characteristics for acquirers, we follow Billett and Xue (2007) and Jordan, Liu, and Wu (2014). We match based on the firm’s return on assets adjusted by the average SIC3 industry ROA (SIC3Adj_ROA), natural log of market equity (LnMktEquity), long-term debt to total assets adjusted by the average SIC3 industry leverage ratio (SIC3Adj_LTDebt/TA), the tangibility of the firm to assets as defined in Appendix B and detailed in Almeida and Campello (2007) (Tangibility/TA), the one quarter sales growth (SaleGr), market equity to book equity (MTB), dividend yield (DivYield), and non-operating income to total assets (NOInc/TA). In addition, we also add an indicator variable for a diversified firm (isDiverse) to proxy for the firm’s tendency to acquire and the natural log of one plus the total number of acquirers in the firm’s SIC3 industry to proxy for industry trends in mergers and acquisitions (LnTotAcqSIC3). Finally, we include the firm’s financing constraints as measured by FC5Pred, defined in Section 2.1 and equation 3. Controlling for constraints not only allows us to account for and match on constraints between the acquirer and matched non-acquirers, but also allows us to observe whether being
constrained factors significantly into the decision to become an acquirer. All controls are lagged one quarter and we include firm, year, and quarter fixed effects. Standard errors are clustered by firm.

Column (i) in Table C.I presents the results from the logit analysis. It is interesting to note that the coefficient on FC5Pred is positive and significant, consistent with firms considering their financial constraints when making acquisitions. The predicted values from this logit regression provide us with the propensity scores upon which we base our matches. We match each acquirer with the five nearest neighbor non-acquirers with replacement in the relevant quarter. Column (ii) repeats the logit analysis using only the matched sample consisting of the actual acquirers and the matched non-acquirers. The results confirm that in our matched sample our covariates have no significant explanatory power between our treatment (actual acquirers, isAcq=1) and control groups (matched non-acquirers, isAcq=0) and the pseudo $R^2$ is close to 0. In other words, we have good covariate balance in our match.

Columns (iii) and (iv) of Table C.I report the means of each control variable for the actual acquirers and matched non-acquirers, respectively. Column (v) presents the p-value from the t-test on the difference in means between the actual acquirers and the matched firms. Reassuringly, and as expected, all of the control variables are statistically indistinguishable between the actual acquirers and matched non-acquirers.
Table C.1: Logit regression for propensity score matching. The dependent variable is isAcq, an indicator variable that equals to 1 if the firm is an acquirer in a specific firm-quarter and 0 if the firm has not acquired within the two years surrounding the relevant quarter. All explanatory variables are lagged one quarter. SIC3Adj.ROA is the return on assets adjusted by the average SIC3 industry ROA. LnMktEquity is the log of the market capitalization. SIC3Adj.LTDebt/TA is the ratio of long-term debt to total book assets adjusted by the average SIC3 industry long-term debt ratio. SaleGr is the one quarter sales growth for the firm. Tangibility/TA is the firm’s tangible assets to total assets as defined in Almeida and Campello (2007). MTB is the ratio of market equity to book equity. DivYield is the dividend yield. NOInc/TA is the non-operating income as a ratio to total assets. isDiverse is an indicator variable for whether the firm has business segments in more than one 3-digit SIC industry. LnTotAcqSIC3 is the natural log of one plus the total number of acquirers in a SIC3 industry in the quarter to proxy for industry trends in M&As. FC5Pred is the composite financing constraint measure defined in Section 2.1 and equation (3). Standard errors are reported in the parentheses and clustered by firm. Significance at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

|                | All Firms Logit (i) | Matched Sample Logit (ii) | Matched Acquirers (iii) | Matched Non-Acquirers (iv) | p-value (v) |
|----------------|---------------------|---------------------------|-------------------------|-----------------------------|-------------|
| 11_SIC3.ROA    | 1.388*** (0.435)    | -0.159 (0.594)            | -0.001                  | -0.001                      | 0.940       |
| 11_LnMkt Equity| 0.312*** (0.026)    | -0.005 (0.042)            | 5.995                   | 5.993                       | 0.927       |
| 11_SIC3.LTDebt/TA | -0.821*** (0.138) | 0.038 (0.204)            | 0.030                   | 0.029                       | 0.709       |
| 11_Tangibility/TA | 1.724*** (0.159)  | 0.116 (0.256)            | 0.514                   | 0.516                       | 0.308       |
| 11_SaleGr      | -0.022 (0.056)      | -0.055 (0.073)            | 0.044                   | 0.040                       | 0.288       |
| 11_MTB         | -0.057*** (0.008)   | 0.006 (0.012)             | 2.942                   | 2.915                       | 0.434       |
| 11_DivYield    | 3.728** (1.522)     | 0.958 (2.118)             | 0.008                   | 0.008                       | 0.550       |
| 11_NOInc/TA    | 1.187 (3.333)       | -0.266 (4.424)            | 0.002                   | 0.002                       | 0.965       |
| 11_isDiverse   | 0.093* (0.049)      | 0.025 (0.073)             | 0.403                   | 0.399                       | 0.515       |
| 11_LnTotAcqSIC3| 0.080*** (0.031)    | -0.020 (0.040)            | 0.767                   | 0.774                       | 0.561       |
| 11_FC5Pred     | 0.058*** (0.021)    | -0.007 (0.032)            | 5.069                   | 5.069                       | 0.998       |

Quarter Fixed Effects? Y
Year Fixed Effects? Y
Firm Fixed Effects? Y
No. Obs. 146,460 45,269 7,551 37,718
Pseudo $R^2$ 0.0335 0.0109

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Table I: Sample summary statistics of financing constraint variables and common firm characteristics for the sample of Compustat firm-quarter observations that have non-missing financing constraint variables from fiscal years 1985 to 2018. Panel A provides the summary statistics. Panel B presents the pairwise correlation matrix. WW is the Whited and Wu (2006) financing constraint index and HPSA is the Hadlock and Pierce (2010) size-age index. FC5 is a composite financing constraint measure defined as WW5+HPSA5+CR3, where WW5 sorts WW into quintiles (0 to 4) each quarter, HPSA5 sorts HPSA into quintiles (0 to 4) each quarter, and CR3 is defined as 0 for a firm with investment-grade credit ratings, 1 for a firm with non-investment grade credit ratings, and 2 for a firm with no credit ratings. The composite measure, FC5, ranges from 0 (least constrained) to 10 (most constrained). FC5Pred is obtained by taking the predicted value from regressing FC5 on WW, HPSA, hasLTCR, hasSTCR, hasInvGrLTCR, and hasInvGrSTCR, where hasLTCR (hasSTCR) is an indicator variable for whether the firm has a S&P long-term debt (commercial paper) credit rating and hasInvGrLTCR (hasInvGrSTCR) is an indicator for whether the firm has an investment-grade S&P long-term debt (commercial paper) credit rating. All other variables are defined in Appendix B.

### Panel A: Sample w/ Non-Missing Financing Constraint Measures

| Variable                      | No. Obs | Mean    | Std Dev | 1%      | 25%     | 50%     | 75%     | 99%     |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| WW                            | 519031  | -0.249  | 0.116   | -0.518  | -0.329  | -0.243  | -0.165  | -0.003  |
| HPSA                          | 519031  | -3.044  | 0.805   | -4.626  | -3.595  | -3.069  | -2.511  | -1.116  |
| FC5                           | 519031  | 5.934   | 3.008   | 0       | 4       | 6       | 8       | 10      |
| FC5Pred                       | 519031  | 5.928   | 2.883   | -0.913  | 4.091   | 6.178   | 7.984   | 11.682  |
| Total Assets ($M)             | 519031  | 2246.5  | 10674.3 | 3.0     | 39.4    | 171.4   | 880.8   | 37302.0 |
| Mkt Equity ($M)               | 519031  | 2381.4  | 11960.1 | 2.2     | 35.9    | 170.4   | 903.8   | 42147.2 |
| BTM                           | 519031  | 0.671   | 0.575   | 0.062   | 0.295   | 0.511   | 0.850   | 3.018   |
| Age (Years)                   | 519031  | 13.4    | 11.1    | 1       | 5       | 10      | 19      | 49      |
| LTD/TA                        | 516349  | 0.159   | 0.170   | 0.000   | 0.002   | 0.109   | 0.267   | 0.642   |
| Sales Growth                  | 509552  | 0.049   | 0.280   | -0.564  | -0.060  | 0.019   | 0.118   | 1.224   |
| PPE/TA                        | 514750  | 0.292   | 0.247   | 0.004   | 0.091   | 0.216   | 0.435   | 0.911   |
| Cash/TA                       | 518083  | 0.179   | 0.216   | 0.000   | 0.023   | 0.087   | 0.256   | 0.893   |
| Capex/TA                      | 506646  | 0.015   | 0.019   | 0.000   | 0.004   | 0.009   | 0.020   | 0.095   |
| RD/TA                         | 513677  | 0.010   | 0.020   | 0.000   | 0.000   | 0.000   | 0.000   | 0.099   |
| CapexRD/TA                    | 508136  | 0.027   | 0.029   | 0.000   | 0.007   | 0.017   | 0.036   | 0.143   |
| Payout Ratio                  | 497155  | 0.143   | 0.412   | 0.000   | 0.000   | 0.000   | 0.079   | 2.206   |
| hasDiv                        | 519031  | 0.300   | 0.458   | 0       | 0       | 0       | 1       | 1       |
| hasLTCR                       | 519031  | 0.178   | 0.383   | 0       | 0       | 0       | 0       | 1       |
| hasSTCR                       | 519031  | 0.052   | 0.221   | 0       | 0       | 0       | 0       | 1       |
| hasInvGrLTCR                  | 519031  | 0.087   | 0.282   | 0       | 0       | 0       | 0       | 1       |
| hasInvGrSTCR                  | 519031  | 0.050   | 0.218   | 0       | 0       | 0       | 0       | 1       |
| iDiverse                      | 519031  | 0.308   | 0.462   | 0       | 0       | 0       | 1       | 1       |
| nDistSeg                      | 519031  | 1.476   | 0.875   | 1       | 1       | 1       | 2       | 5       |
| 1-HHI_Seg                     | 519031  | 0.155   | 0.312   | 0       | 0       | 0       | 0.001   | 1       |

### Panel B: Pairwise Correlation Matrix

|       | WW      | HPSA    | FC5     | FC5Pred |
|-------|---------|---------|---------|---------|
| WW    | 1.0000  |         |         |         |
| HPSA  | 0.7981  | 1.0000  |         |         |
| FC5   | 0.8925  | 0.8818  | 1.0000  |         |
| FC5Pred| 0.9395  | 0.9258  | 0.9519  | 1.0000  |
| hasLTCR| -0.5285 | -0.4853 | -0.6397 | -0.6688 |
| hasSTCR| -0.3965 | -0.3286 | -0.4326 | -0.4542 |
| hasInvGrLTCR| -0.4784 | -0.3996 | -0.5576 | -0.5841 |
| hasInvGrSTCR| -0.3909 | -0.3259 | -0.4293 | -0.4505 |
| hasDiv | -0.5964 | -0.4763 | -0.5761 | -0.5958 |
| Payout Ratio | -0.1562 | -0.1559 | -0.1553 | -0.1504 |
| Cash/TA| 0.2666  | 0.2063  | 0.3151  | 0.2871  |
| Excess Cash/TA | -0.0399 | -0.0388 | -0.0333 | -0.0404 |
Table II: Basic validity check for the composite financing constraint measure, FC5Pred. Panel A reports the frequency and timing of switching between financing constraint bins. Firms are sorted based on FC5Pred and assigned into terciles every quarter. For each firm, the number of switches is recorded under Num Switches, the average number of quarters between switches is recorded under Avg. Num Qtrtrs, the median number of quarters between switches is recorded under Med. Num Qtrtrs, and the maximum number of quarters between switches is recorded under Max. Num Qtrtrs. The distribution for the average, median, and maximum switch times for all firms are reported below. Panel B tests the relationship between firm structure and financing constraints. We use three variables to measure a diversified firm. isDiverse is an indicator variable for whether the firm has business segments in more than one 3-digit SIC industry. nDistSeg is the number of distinct 3-digit SIC industries in which the firm has business segments. HHISEg is the Herfindahl-Hirschman Index for the distinct business segments of the firm using sales and proxies for the sales concentration by business segments within the firm. MainSIC3_FC is the average FCPred5 for firms within the same main 3-digit SIC industry. Standard errors are reported in the parentheses and clustered by firm. Significance at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

### Panel A: FC5Pred sorted into terciles

| Change in Bins | -2 | -1 | 0  | 1  | 2  |
|----------------|----|----|----|----|----|
| Frequency      | 625| 31,257| 414,426| 29,400| 522|
| % of Sample    | 0.1%| 6.6%| 87.0%| 6.2%| 0.1%|

|                              | N   | Mean | Std Dev | 1%  | 25% | 50% | 75% | 99% |
|------------------------------|-----|------|---------|-----|-----|-----|-----|-----|
| Num Switches By Firm         | 7967| 7.720| 8.537   | 1.0 | 2.0 | 5.0 | 10.0| 43.0|
| Avg. Num Qtrtrs By Firm      | 7967| 6.477| 9.170   | 1.0 | 2.0 | 3.7 | 7.0 | 47.0|
| Med. Num Qtrtrs By Firm      | 7967| 4.542| 9.157   | 1.0 | 1.0 | 1.5 | 3.0 | 47.0|
| Max. Num Qtrtrs By Firm      | 7967| 17.976| 18.755 | 1.0 | 4.0 | 11.0| 25.0| 88.0|

### Panel B: Financing Constraint Composite FC5Pred

|                | (i)          | (ii)         | (iii)        | (iv)         | (v)          | (vi)         | (vii)        | (viii)       |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| isDiverse      | -0.212***    |              |              |              |              |              |              |              |
|                | (0.021)      |              |              |              |              |              |              |              |
| nDistSeg       | -0.168***    |              |              |              |              |              |              |              |
|                | (0.012)      |              |              |              |              |              |              |              |
| 1-HHISEg       | -0.318***    | -0.277***    |              |              |              |              |              |              |
|                | (0.020)      | (0.018)      |              |              |              |              |              |              |
| MainSIC3_FC    |              |              |              | 0.519***     | 0.555***     | 0.516***     | 0.493***     |              |
|                |              |              |              | (0.010)      | (0.010)      | (0.010)      | (0.016)      |              |
| isDiverse x MainSIC3_FC | -0.039***   |              |              |              |              |              |              |              |
|                | (0.003)      |              |              |              |              |              |              |              |
| nDistSeg x MainSIC3_FC |              |              |              |              | -0.031***    |              |              |              |
|                |              |              |              |              | (0.002)      |              |              |              |
| 1-HHISEg x MainSIC3_FC |              |              |              |              |              | -0.057***    | -0.048***    |              |
|                |              |              |              |              |              | (0.003)      | (0.003)      |              |
| Constant       | 7.624***     | 7.835***     | 7.582***     | 6.467***     | 4.107***     | 4.124***     | 4.076***     | 3.323***     |
|                | (0.030)      | (0.036)      | (0.029)      | (0.039)      | (0.074)      | (0.073)      | (0.073)      | (0.109)      |
| Quarter Fixed Effects? | Y | Y | Y | Y | Y | Y | Y | Y |
| Year Fixed Effects?    | Y | Y | Y | Y | Y | Y | Y | Y |
| Firm Fixed Effects? | Y | Y | Y | Y | Y | Y | Y | Y |
| No. Obs.            | 519,031      | 519,031      | 519,031      | 160,112      | 519,031      | 519,031      | 519,031      | 160,112      |
| Adjusted $R^2$      | 0.4388        | 0.4414        | 0.4401        | 0.3894        | 0.4945        | 0.4975        | 0.4960        | 0.4615        |
Table III: Method of payments, results from estimation of equation (6). isShares is a binary variable that takes the value of 1 if the firm uses shares as a method of payment in the acquisition, and 0 otherwise. Column (i) uses the sample of acquirers with Compustat data. Column (ii) uses only the acquisitions in which the acquirer is defined to be undervalued (isUnderVal=1) and column (iii) uses only the acquisitions in which the acquirer is defined to be overvalued (isOverVal=1). We define a firm to be undervalued (overvalued) if it has a negative (positive) firm-specific error based on the Rhodes-Kropf Robinson, and Viswanathan (2005) decomposition of the market-to-book ratio into three components: firm-specific error, time-series sector error, and long-run market-to-book. Acq_FCPred is the firm’s financing constraint measure one year prior to announcement. DealVal/Acq_TA is the total dollar value of the deal as a ratio to total assets one year prior to announcement. Acq_LnTA is the natural log of total assets one year prior to announcement. Acq_BTM is the book equity-to-market equity ratio one year prior to announcement. Standard errors are reported in the parentheses and clustered by both firm and year-quarter as in Petersen (2009). Significance at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

|                      | All          | isUnderVal=1 | isOverVal=1 |
|----------------------|--------------|--------------|-------------|
|                      | (i)          | (ii)         | (iii)       |
| Acq_FCPred5          | 0.277***     | 0.383***     | 0.127       |
|                      | (0.067)      | (0.124)      | (0.119)     |
| DealVal/Acq_TA       | 0.151***     | 0.248***     | 0.096       |
|                      | (0.054)      | (0.123)      | (0.064)     |
| Acq_LnTA             | 0.073        | 0.100        | -0.165      |
|                      | (0.085)      | (0.203)      | (0.161)     |
| Acq_BTM              | -0.467***    | -0.025       | -0.055      |
|                      | (0.180)      | (0.282)      | (0.443)     |
| Constant             | -4.245***    | -5.832***    | -1.891      |
|                      | (0.885)      | (1.798)      | (1.571)     |
| No. Obs.             | 4,169        | 841          | 830         |
| Pseudo $R^2$         | 0.0726       | 0.0835       | 0.0787      |
Table IV: Type of acquisitions, results from logit estimation using the sample of acquirer-target pairs merged with Compustat. Column (i) runs a logit estimation using isLessFC on acquirer and target characteristics. isLessFC is defined as an indicator variable that takes the value of 1 if the difference between the target’s FC5Pred measure one year prior to M&A announcement and acquirer’s FC5Pred one-year prior is negative (i.e., the target is less financially constrained than the acquirer), and 0 otherwise. Column (ii) runs a logit estimation using hasMoreCF on acquirer and target characteristics. hasMoreCF is defined as an indicator variable that takes the value of 1 if the difference between the target’s cashflow to total assets ratio one year prior to M&A and the acquirer’s cashflow to total assets ratio one year prior is positive (i.e., the target has a higher cashflow to assets ratio than the acquirer), and 0 otherwise. Column (iii) runs a logit estimation on hasMoreCash, which takes the value 1 if the target has a higher cash to assets ratio than the acquirer one year prior to M&A and 0 otherwise. Column (iv) runs a logit estimation on hasMoreExcessCash, which takes the value 1 if the target has a higher excess cash to assets ratio, as estimated according to Opler, et al (1999), than the acquirer one year prior to M&A and 0 otherwise. Column (v) runs a logit estimation on hasMoreSalesGr, which takes the value of 1 if the target has a higher sales growth than the acquirer one year prior to M&A, and 0 otherwise. Column (vi) runs a logit estimation on isDiffSIC, which takes the value 1 if the target is in a different 3-digit SIC industry than the acquirer, and 0 otherwise. Acq_FC5Pred5 is the acquirer’s financing constraint measure one year prior to M&A announcement. Acq_isFocused takes the value of 1 if the acquirer is a single-segmented firm one year prior to acquisition. DealVal/TA is the total dollar value of the deal as a ratio to total assets one year prior to announcement. LnTA is the natural log of total assets one year prior to announcement. BTM is the ratio of book equity to market equity one year prior to announcement. Standard errors are reported in the parentheses and clustered by both firm and year-quarter as in Petersen (2009). Significance at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

|                  | Pr(isLessFC) | Pr(hasMoreCF) | Pr(hasMoreCash) | Pr(hasMoreExcessCash) | Pr(hasMoreSalesGr) | Pr(isDiffSIC) |
|------------------|--------------|---------------|-----------------|------------------------|-------------------|--------------|
| Acq_FC5Pred5     | 0.623***     | 0.034         | 0.139           | 0.205*                 | 0.011             | -0.202*      |
|                  | (0.166)      | (0.122)       | (0.113)         | (0.110)                | (0.111)           | (0.113)      |
| Acq_isFocused    |              |               |                 |                        |                   | -1.037**     |
|                  |              |               |                 |                        |                   | (0.456)      |
| Acq_FC5Pred5*isFocused |          |               |                 |                        |                   | 0.077        |
|                  |              |               |                 |                        |                   | (0.092)      |
| DealVal/Acq_TA   | 0.263        | 0.227         | -0.259          | 0.174                  | 0.259             | 0.482        |
|                  | (0.480)      | (0.342)       | (0.360)         | (0.269)                | (0.390)           | (0.335)      |
| Acq_LnTA         | -0.521       | -0.101        | 0.157           | 0.437***               | -0.104            | -0.133       |
|                  | (0.350)      | (0.165)       | (0.173)         | (0.158)                | (0.175)           | (0.169)      |
| Acq_BTM          | -0.341       | 0.573         | -0.457          | -0.161                 | 0.172             | -0.785       |
|                  | (0.867)      | (0.497)       | (0.582)         | (0.503)                | (0.487)           | (0.526)      |
| DealVal/Trg_TA   | 0.670        | 0.319         | 0.823***        | 0.191                  | 0.375             | -0.486*      |
|                  | (0.458)      | (0.259)       | (0.253)         | (0.222)                | (0.239)           | (0.248)      |
| Trg_LnTA         | 1.479***     | 0.081         | 0.101           | 0.034                  | 0.176***          | -0.174*      |
|                  | (0.242)      | (0.087)       | (0.083)         | (0.070)                | (0.084)           | (0.095)      |
| Trg_BTM          | 0.965        | -1.795***     | 0.332           | -0.113                 | -0.227            | 0.342        |
|                  | (0.772)      | (0.395)       | (0.491)         | (0.464)                | (0.490)           | (0.523)      |
| Constant         | -10.918***   | 0.168         | -2.895*         | -3.549***              | -1.020            | 3.539**      |
|                  | (2.417)      | (1.669)       | (1.646)         | (1.572)                | (1.579)           | (1.586)      |
| No. Obs.         | 361          | 361           | 361             | 361                    | 361               | 361          |
| Pseudo $R^2$     | 0.393        | 0.0445        | 0.0365          | 0.0258                 | 0.0209            | 0.0450       |
Table V: Change in financing constraints, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the FC5Pred composite financing constraint measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Firms are classified as highly unconstrained (constrained) if it falls into the bottom (top) quintile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: FC5Pred 2-Qrts Post | Panel B: FC5Pred 4-Qrts Post | Panel C: FC5Pred 6-Qrts Post | Panel D: FC5Pred 8-Qtrs Post |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| - FC5Pred 1-Yr Prior          | - FC5Pred 1-Yr Prior          | - FC5Pred 1-Yr Prior          | - FC5Pred 1-Yr Prior          |
| Acquirer                     | Matched Acquirer Firms        | Acquirer                     | Matched Acquirer Firms        |
| (i)                          | (ii)                         | (i)                          | (ii)                         |
| Effective M&A                |                               |                               |                               |
| UnConstrained                | -0.167 **                    | -0.251 ***                   | -0.841 ***                   |
|                              | (0.014)                      | (0.011)                      | (0.016)                      |
| Constrained                  | -0.502 ***                   | -0.296 ***                   | -0.206 ***                   |
|                              | (0.026)                      | (0.020)                      | (0.030)                      |
| Highly UnConstrained         | -0.130 ***                   | -0.258 ***                   | 0.129 ***                    |
|                              | (0.016)                      | (0.013)                      | (0.019)                      |
| Highly Constrained           | -0.592 ***                   | -0.309 ***                   | -0.412 ***                   |
|                              | (0.038)                      | (0.031)                      | (0.045)                      |
| Withdrawn M&A                |                               |                               |                               |
| UnConstrained                | -0.146 **                    | -0.247 ***                   | 0.101                        |
|                              | (0.073)                      | (0.061)                      | (0.094)                      |
| Constrained                  | -0.141                       | -0.151 **                    | -0.091                       |
|                              | (0.112)                      | (0.076)                      | (0.131)                      |

| Effective M&A                |                               |                               |                               |
| UnConstrained                | -0.252 ***                   | -0.378 ***                   | 0.126 ***                    |
|                              | (0.016)                      | (0.013)                      | (0.019)                      |
| Constrained                  | -0.599 ***                   | -0.407 ***                   | -0.192 ***                   |
|                              | (0.028)                      | (0.022)                      | (0.033)                      |
| Highly UnConstrained         | -0.200 ***                   | -0.383 ***                   | 0.183 ***                    |
|                              | (0.018)                      | (0.015)                      | (0.022)                      |
| Highly Constrained           | -0.696 ***                   | -0.429 ***                   | -0.266 ***                   |
|                              | (0.044)                      | (0.034)                      | (0.052)                      |
| Withdrawn M&A                |                               |                               |                               |
| UnConstrained                | -0.221                       | -0.366 ***                   | 0.145                        |
|                              | (0.076)                      | (0.074)                      | (0.103)                      |
| Constrained                  | -0.386 ***                   | -0.320 ***                   | -0.066                       |
|                              | (0.136)                      | (0.101)                      | (0.155)                      |
| ConsDID Acquirer Firms       |                               |                               |                               |
| (i)                          | (ii)                         | (iii)                        | (iv)                         |
| Effective M&A                | -0.230 ***                   | -0.320 ***                   | 0.099 ***                    |
|                              | (0.013)                      | (0.011)                      | (0.016)                      |
| Constrained                  | -0.523 ***                   | -0.346 ***                   | -0.177 ***                   |
|                              | (0.025)                      | (0.018)                      | (0.029)                      |
| Highly UnConstrained         | -0.184 ***                   | -0.319 ***                   | 0.136 ***                    |
|                              | (0.015)                      | (0.013)                      | (0.019)                      |
| Highly Constrained           | -0.600 ***                   | -0.351 ***                   | -0.177 ***                   |
|                              | (0.039)                      | (0.027)                      | (0.045)                      |
| Withdrawn M&A                | -0.136 **                    | -0.278 ***                   | 0.142 **                     |
|                              | (0.058)                      | (0.052)                      | (0.084)                      |
| Constrained                  | -0.269 ***                   | -0.261 ***                   | -0.008                       |
|                              | (0.098)                      | (0.072)                      | (0.116)                      |
| ConsDID                      |                               |                               |                               |
| (i)                          | (ii)                         | (iii)                        | (iv)                         |
| Effective M&A                | -0.291 ***                   | -0.421 ***                   | 0.130 ***                    |
|                              | (0.015)                      | (0.013)                      | (0.019)                      |
| Constrained                  | -0.621 ***                   | -0.450 ***                   | -0.171 ***                   |
|                              | (0.026)                      | (0.022)                      | (0.054)                      |
| Highly UnConstrained         | -0.239 ***                   | -0.425 ***                   | 0.186 ***                    |
|                              | (0.017)                      | (0.015)                      | (0.023)                      |
| Highly Constrained           | -0.702 ***                   | -0.475 ***                   | -0.226 ***                   |
|                              | (0.044)                      | (0.034)                      | (0.054)                      |
| Withdrawn M&A                | -0.210 ***                   | -0.406 ***                   | 0.196 **                     |
|                              | (0.069)                      | (0.062)                      | (0.098)                      |
| Constrained                  | -0.349 ***                   | -0.467 ***                   | 0.118                        |
|                              | (0.132)                      | (0.102)                      | (0.153)                      |
Table VI: Change in financing constraints for alternative measures of financial constraints, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between each respective financial constraints measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. For the Whited and Wu (2006) index and for the Hadlock and Pierce (2010) size-age index, firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of that index one year prior to M&A. For the payout ratio, firms are classified as unconstrained (constrained) if it falls into the top (bottom) tercile one year prior to M&A. Panels B through D reports the difference in each respective financial constraints measure between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: FCMeasure 2-Qrts Post | Panel B: FCMeasure 4-Qrts Post |
|---------------------------------|---------------------------------|
| - FCMeasure 1-Yr Prior          | - FCMeasure 1-Yr Prior          |
| Acquirer - Matched Firms       | Acquirer - Matched Firms       |
| (i)                            | (i)                            |
| (ii)                           | (ii)                           |
| (iii)                          | (iii)                          |
| (iv)                           | (iv)                           |
| Whited and Wu (2006) Index     | Whited and Wu (2006) Index     |
| UnConstrained                  | UnConstrained                  |
| -0.001                         | -0.007***                     |
| (0.001)                        | (0.001)                       |
| 0.006***                      | -0.003***                     |
| (0.001)                        | (0.001)                       |
| Constrained                    | Constrained                    |
| -0.023***                     | -0.008***                     |
| (0.002)                        | (0.001)                       |
| -0.016***                    | -0.022***                     |
| (0.002)                        | (0.002)                       |
| Hadlock and Pierce (2010) Size-Age Index | Hadlock and Pierce (2010) Size-Age Index |
| UnConstrained                  | UnConstrained                  |
| -0.058***                     | -0.092***                     |
| (0.001)                        | (0.002)                       |
| 0.035***                      | -0.073***                     |
| (0.002)                        | (0.002)                       |
| Constrained                    | Constrained                    |
| -0.197***                     | -0.108***                     |
| (0.007)                        | (0.005)                       |
| -0.090***                    | -0.124***                     |
| (0.008)                        | (0.006)                       |
| Payout Ratio                   | Payout Ratio                   |
| UnConstrained                  | UnConstrained                  |
| -0.191***                     | 0.012                         |
| (0.021)                        | (0.008)                       |
| -0.203***                    | -0.199***                     |
| (0.022)                        | (0.020)                       |
| Constrained                    | Constrained                    |
| 0.061***                      | 0.011                         |
| (0.006)                        | (0.007)                       |
| 0.050***                     | 0.253***                      |
| (0.009)                        | (0.021)                       |
| Panel C: FCMeasure 6-Qrts Post | Panel D: FCMeasure 8-Qtrs Post |
| - FCMeasure 1-Yr Prior          | - FCMeasure 1-Yr Prior          |
| Acquirer - Matched Firms       | Acquirer - Matched Firms       |
| (i)                            | (i)                            |
| (ii)                           | (ii)                           |
| (iii)                          | (iii)                          |
| (iv)                           | (iv)                           |
| Whited and Wu (2006) Index     | Whited and Wu (2006) Index     |
| UnConstrained                  | UnConstrained                  |
| -0.002*                       | -0.009***                     |
| (0.001)                        | (0.001)                       |
| 0.008***                      | -0.003***                     |
| (0.001)                        | (0.001)                       |
| Constrained                    | Constrained                    |
| -0.024***                     | -0.010***                     |
| (0.002)                        | (0.001)                       |
| -0.015***                    | -0.022***                     |
| (0.002)                        | (0.002)                       |
| Hadlock and Pierce (2010) Size-Age Index | Hadlock and Pierce (2010) Size-Age Index |
| UnConstrained                  | UnConstrained                  |
| -0.088***                     | -0.143***                     |
| (0.001)                        | (0.002)                       |
| 0.054***                      | -0.103***                     |
| (0.002)                        | (0.003)                       |
| Constrained                    | Constrained                    |
| -0.231***                     | -0.131***                     |
| (0.008)                        | (0.005)                       |
| -0.100***                    | -0.157***                     |
| (0.009)                        | (0.009)                       |
| Payout Ratio                   | Payout Ratio                   |
| UnConstrained                  | UnConstrained                  |
| -0.227***                     | 0.036***                      |
| (0.020)                        | (0.009)                       |
| -0.263***                    | -0.205***                     |
| (0.022)                        | (0.022)                       |
| Constrained                    | Constrained                    |
| 0.076***                      | 0.010                         |
| (0.008)                        | (0.007)                       |
| 0.065***                     | 0.328***                      |
| (0.011)                        | (0.022)                       |
Table VII: Change in financing constraints controlling for relative size differentials, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the FC5Pred composite financing constraint measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Firms are classified as Low (High) Size Change if their relative size differential sorts below (above) the median. Relative size differential is calculated by taking ratio of the change in total assets between 2-quarters post-acquisition and one year prior to acquisition over total assets one year prior to acquisition. Only observations where both the actual acquirer and its matched non-acquiring firms sort into the same half are retained. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: FC5Pred 2-Qrts Post | Panel B: FC5Pred 4-Qrts Post | Panel C: FC5Pred 6-Qrts Post | Panel D: FC5Pred 8-Qtrs Post |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                             | Acquirer Firms | Matched Firms | Matched Firms | Matched Firms | Acquirer Firms | Matched Firms | Matched Firms | Matched Firms | Acquirer Firms | Matched Firms | Matched Firms | Matched Firms | Acquirer Firms | Matched Firms | Matched Firms | Matched Firms |
|                             | (i)            | (ii)           | (iii)          | (iv)           | (i)            | (ii)           | (iii)          | (iv)           | (i)            | (ii)           | (iii)          | (iv)           | (i)            | (ii)           | (iii)          | (iv)           |
| Low Size Change              |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |
| UnConstrained               | -0.134***      | -0.109***      | -0.026         | -0.161***      | -0.149***      | -0.011         | -0.205***      | -0.207***      | 0.001          | -0.235***      | -0.225***      | -0.099         | -0.203***      | -0.554***      | 0.251***       | 0.001          |
| (0.019)                     | (0.012)        | (0.021)        | (0.017)        | (0.011)        | (0.021)        | (0.017)        | (0.021)        | (0.028)        | (0.027)        | (0.021)        | (0.028)        | (0.027)        | (0.021)        | (0.028)        | (0.024)        | (0.024)        |
| Constrained                 | -0.230***      | -0.077***      | -0.126***      | -0.228***      | -0.103***      | -0.125***      | -0.303***      | -0.144***      | -0.138***      | -0.330***      | -0.174***      | -0.156***      | -0.303***      | -0.554***      | 0.251***       | 0.001          |
| (0.036)                     | (0.021)        | (0.039)        | (0.031)        | (0.021)        | (0.021)        | (0.031)        | (0.021)        | (0.028)        | (0.044)        | (0.037)        | (0.027)        | (0.045)        | (0.037)        | (0.028)        | (0.024)        | (0.024)        |
| High Size Change            |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |
| UnConstrained               | -0.201***      | -0.400***      | 0.198***       | -0.288***      | -0.495***      | 0.207***       | -0.303***      | -0.554***      | 0.251***       | -0.356***      | -0.629***      | 0.273***       | -0.303***      | -0.554***      | 0.251***       | 0.001          |
| (0.020)                     | (0.016)        | (0.023)        | (0.019)        | (0.015)        | (0.024)        | (0.020)        | (0.021)        | (0.028)        | (0.044)        | (0.037)        | (0.027)        | (0.045)        | (0.037)        | (0.028)        | (0.024)        | (0.024)        |
| Constrained                 | -0.626***      | -0.393***      | -0.432***      | -0.670***      | -0.469***      | -0.201***      | -0.756***      | -0.535***      | -0.473***      | -0.771***      | -0.592***      | -0.179***      | -0.756***      | -0.535***      | -0.473***      | 0.001          |
| (0.030)                     | (0.027)        | (0.039)        | (0.029)        | (0.023)        | (0.028)        | (0.034)        | (0.025)        | (0.028)        | (0.044)        | (0.034)        | (0.028)        | (0.046)        | (0.034)        | (0.028)        | (0.044)        | (0.046)        | (0.050)        |
Table VIII: Change in financing constraints, using the propensity-score matched sample requiring control firms to have net equity issuances. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Furthermore, we place the additional restriction that all controls must also have net equity issuance over the matched quarter. This ensures we are comparing actual acquirers to their matched firms that are issuing equity over the same quarter. Panel A reports the average difference between the FC5Pred composite financing constraint measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Firms are classified as highly unconstrained (constrained) if it falls into the bottom (top) quintile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: FC5Pred 2-Qrts Post M&A - FC5Pred 1-Yr Prior | Panel B: FC5Pred 4-Qrts Post M&A - FC5Pred 1-Yr Prior |
|-------------------------------------------------------|-------------------------------------------------------|
| Acquirer (i) Matched Firms (SEO) - Matched Firms (SEO) | Acquirer (i) Matched Firms (SEO) - Matched Firms (SEO) |
| UnConstrained | Constrained | Highly UnConstrained | Highly Constrained |
| -0.171 *** (0.015) | -0.501 *** (0.028) | -0.138 *** (0.018) | -0.574 *** (0.012) |
| -0.331 *** (0.015) | -0.368 *** (0.024) | -0.336 *** (0.018) | -0.349 *** (0.015) |
| 0.160 *** (0.019) | -0.133 *** (0.035) | 0.198 *** (0.023) | -0.225 *** (0.051) |
| ConsDID (iv) | ConsDID (iv) | ConsDID (iv) | ConsDID (iv) |
| -0.221 *** (0.014) | -0.528 *** (0.027) | -0.189 *** (0.016) | -0.582 *** (0.041) |
| -0.397 *** (0.015) | -0.455 *** (0.025) | -0.395 *** (0.018) | -0.423 *** (0.035) |
| 0.176 *** (0.020) | -0.070 *** (0.035) | 0.206 *** (0.023) | -0.158 *** (0.052) |

| Panel C: FC5Pred 6-Qrts Post M&A - FC5Pred 1-Yr Prior | Panel D: FC5Pred 8-Qrts Post M&A - FC5Pred 1-Yr Prior |
|-------------------------------------------------------|-------------------------------------------------------|
| Acquirer (i) Matched Firms (SEO) - Matched Firms (SEO) | Acquirer (i) Matched Firms (SEO) - Matched Firms (SEO) |
| UnConstrained | Constrained | Highly UnConstrained | Highly Constrained |
| -0.248 *** (0.017) | -0.593 *** (0.031) | -0.202 *** (0.020) | -0.669 *** (0.049) |
| -0.469 *** (0.017) | -0.519 *** (0.027) | -0.473 *** (0.020) | -0.489 *** (0.039) |
| 0.221 *** (0.022) | -0.074 * (0.039) | 0.271 *** (0.026) | -0.180 *** (0.059) |
| ConsDID (iv) | ConsDID (iv) | ConsDID (iv) | ConsDID (iv) |
| -0.288 *** (0.016) | -0.614 *** (0.031) | -0.240 *** (0.018) | -0.663 *** (0.049) |
| -0.503 *** (0.017) | -0.5-94 *** (0.028) | -0.504 *** (0.021) | -0.508 *** (0.046) |
| 0.215 *** (0.023) | -0.066 *** (0.041) | 0.264 *** (0.027) | -0.154 *** (0.061) |
| -0.281 *** (0.044) | | | -0.418 *** (0.060) |
Table IX: Change in financing constraints for single acquirers, first acquisitions of serial acquirers, and subsequent acquisitions of serial acquirers, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the FC5Pred composite financing constraint measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirer and its matched non-acquirers. Single Acquirer are acquirers who only acquired once in our sample and Serial Acquirer are those who made more than one acquisition in our sample, with the first and subsequent acquisitions partitioned. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: FC5Pred 2-Qtrs Post | Panel B: FC5Pred 4-Qtrs Post |
|------------------------------|------------------------------|
| FC5Pred 1-Yr Prior | FC5Pred 1-Yr Prior |
| **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** |
| (i) | (ii) | (iii) | (iv) | (i) | (ii) | (iii) | (iv) | (i) | (ii) | (iii) | (iv) | (i) | (ii) | (iii) | (iv) |
| **Single Acquirer** | | | | | | | | | | | | | | | |
| UnConstrained | -0.156 *** | -0.245 *** | 0.089 *** | -0.208 *** | -0.311 *** | 0.103 *** |
| | (0.020) | (0.016) | (0.024) | (0.019) | (0.016) | (0.025) |
| Constrained | -0.481 *** | -0.324 *** | -0.157 *** | -0.246 *** | -0.496 *** | -0.382 *** | -0.114 *** | -0.218 *** |
| | (0.038) | (0.029) | (0.046) | (0.047) | (0.038) | (0.027) | (0.044) | (0.047) |
| **Serial Acquirer: First Acquisition** | | | | | | | | | | | | | | | |
| UnConstrained | -0.150 *** | -0.236 *** | 0.066 *** | -0.224 *** | -0.306 *** | 0.082 ** |
| | (0.027) | (0.021) | (0.031) | (0.025) | (0.022) | (0.033) |
| Constrained | -0.535 *** | -0.249 *** | -0.286 *** | -0.371 *** | -0.566 *** | -0.328 *** | -0.238 *** | -0.320 *** |
| | (0.040) | (0.030) | (0.046) | (0.054) | (0.039) | (0.027) | (0.046) | (0.055) |
| **Serial Acquirer: Subsequent Acquisitions** | | | | | | | | | | | | | | | |
| UnConstrained | -0.201 *** | -0.275 *** | 0.073 ** | -0.237 *** | -0.347 *** | 0.109 *** |
| | (0.026) | (0.023) | (0.031) | (0.024) | (0.020) | (0.029) |
| Constrained | -0.478 *** | -0.332 *** | -0.146 * | -0.220 *** | -0.491 *** | -0.216 *** | -0.325 *** |
| | (0.065) | (0.065) | (0.078) | (0.075) | (0.054) | (0.052) | (0.067) | (0.069) |
| **Panel C: FC5Pred 6-Qtrs Post** | | | | | | | | | | | | | | | |
| FC5Pred 1-Yr Prior | | | | | | | | | | | | | | | |
| **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** | **Acquirer** | **Matched Firms** |
| (i) | (ii) | (iii) | (iv) | (i) | (ii) | (iii) | (iv) | (i) | (ii) | (iii) | (iv) |
| **Single Acquirer** | | | | | | | | | | | | | | | |
| UnConstrained | -0.229 *** | -0.362 *** | 0.134 *** | -0.275 *** | -0.409 *** | 0.134 *** |
| | (0.023) | (0.019) | (0.028) | (0.022) | (0.018) | (0.028) |
| Constrained | -0.586 *** | -0.444 *** | -0.142 *** | -0.276 *** | -0.600 *** | -0.475 *** | -0.125 ** | -0.259 *** |
| | (0.044) | (0.032) | (0.051) | (0.054) | (0.045) | (0.031) | (0.052) | (0.054) |
| **Serial Acquirer: First Acquisition** | | | | | | | | | | | | | | | |
| UnConstrained | -0.248 *** | -0.385 *** | 0.137 *** | -0.321 *** | -0.435 *** | 0.114 *** |
| | (0.031) | (0.025) | (0.038) | (0.029) | (0.026) | (0.039) |
| Constrained | -0.634 *** | -0.362 *** | -0.272 *** | -0.409 *** | -0.648 *** | -0.423 *** | -0.224 *** | -0.338 *** |
| | (0.045) | (0.033) | (0.051) | (0.062) | (0.043) | (0.033) | (0.053) | (0.064) |
| **Serial Acquirer: Subsequent Acquisitions** | | | | | | | | | | | | | | | |
| UnConstrained | -0.294 *** | -0.398 *** | 0.104 *** | -0.289 *** | -0.429 *** | 0.140 *** |
| | (0.028) | (0.025) | (0.034) | (0.026) | (0.024) | (0.034) |
| Constrained | -0.544 *** | -0.409 *** | -0.135 * | -0.239 *** | -0.617 *** | -0.438 *** | -0.179 ** | -0.319 *** |
| | (0.060) | (0.076) | (0.080) | (0.082) | (0.063) | (0.077) | (0.089) | (0.084) |
Table X: Change in financing constraints between diversifying and non-diversifying acquisitions, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the FC5Pred composite financing constraint measure two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Diversifying M&A’s are acquisitions in which target is in a different 3-digit SIC industry than the acquirer and Non-Diversifying M&A’s are acquisitions in which both the acquirer and target are in the same 3-digit SIC industry. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

|                  | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID |
|------------------|----------------|---------------|-----------------|---------|----------------|---------------|-----------------|---------|----------------|---------------|-----------------|---------|
|                  | (i)            | (ii)          | (iii)           | (iv)     | (i)            | (ii)          | (iii)           | (iv)     | (i)            | (ii)          | (iii)           | (iv)     |
| Diversifying M&A | UnConstrained  | -0.133 ***    | -0.206 ***      | 0.075 *** | -0.185 ***     | -0.254 ***    | 0.069 ***        |
|                  |                | (0.021)       | (0.014)         | (0.024)  | (0.019)        | (0.013)       | (0.023)          |
|                  | Constrained    | -0.691 ***    | -0.200 ***      | -0.491 ***| -0.565 ***     | -0.721 ***     | -0.237 ***       | -0.484 ***| -0.553 ***     | -0.237 ***     | -0.484 ***       | -0.553 ***|
|                  |                | (0.053)       | (0.029)         | (0.056)  | (0.052)        | (0.053)       | (0.028)          | (0.060)  | (0.052)        | (0.028)       | (0.060)          | (0.052)  |
| Non-Diversifying M&A | UnConstrained | -0.148 ***    | -0.215 ***      | 0.067 **  | -0.197 ***     | -0.254 ***    | 0.057 **         |
|                  |                | (0.023)       | (0.016)         | (0.026)  | (0.022)        | (0.015)       | (0.026)          |
|                  | Constrained    | -0.587 ***    | -0.229 ***      | -0.368 ***| -0.434 ***     | -0.588 ***     | -0.311 ***       | -0.277 ***| -0.334 ***     | -0.311 ***     | -0.277 ***       | -0.334 ***|
|                  |                | (0.052)       | (0.031)         | (0.057)  | (0.056)        | (0.054)       | (0.033)          | (0.061)  | (0.057)        | (0.033)       | (0.061)          | (0.057)  |
|                  | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID | Acquirer Firms | Matched Firms | - Matched Firms | - UnCDID |
|                  | (i)            | (ii)          | (iii)           | (iv)     | (i)            | (ii)          | (iii)           | (iv)     | (i)            | (ii)          | (iii)           | (iv)     |
| Diversifying M&A | UnConstrained  | -0.189 ***    | -0.305 ***      | 0.116 *** | -0.212 ***     | -0.350 ***    | 0.138 ***        |
|                  |                | (0.023)       | (0.016)         | (0.026)  | (0.021)        | (0.015)       | (0.025)          |
|                  | Constrained    | -0.812 ***    | -0.333 ***      | -0.479 ***| -0.595 ***     | -0.833 ***     | -0.342 ***       | -0.491 ***| -0.629 ***     | -0.342 ***     | -0.491 ***       | -0.629 ***|
|                  |                | (0.060)       | (0.034)         | (0.065)  | (0.059)        | (0.060)       | (0.032)          | (0.065)  | (0.058)        | (0.032)       | (0.065)          | (0.058)  |
| Non-Diversifying M&A | UnConstrained | -0.233 ***    | -0.311 ***      | 0.077 **  | -0.283 ***     | -0.341 ***    | 0.058 **         |
|                  |                | (0.027)       | (0.019)         | (0.032)  | (0.025)        | (0.017)       | (0.031)          |
|                  | Constrained    | -0.669 ***    | -0.395 ***      | -0.274 ***| -0.351 ***     | -0.641 ***     | -0.443 ***       | -0.198 ***| -0.256 ***     | -0.443 ***     | -0.198 ***       | -0.256 ***|
|                  |                | (0.062)       | (0.044)         | (0.072)  | (0.069)        | (0.060)       | (0.042)          | (0.071)  | (0.067)        | (0.042)       | (0.071)          | (0.067)  |
Table XI: Change in long-term debt issuance, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the natural log of long-term debt issuance (LTDebtIssue) two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Firms are classified as highly unconstrained (constrained) if it falls into the bottom (top) quintile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: Ln(LTDebtIssue) 2-Qrts Post - Ln(LTDebtIssue) 1-Yr Prior | Panel B: Ln(LTDebtIssue) 4-Qrts Post - Ln(LTDebtIssue) 1-Yr Prior |
|---------------------------------------------------------------|---------------------------------------------------------------|
| Acquirer Firms | Matched Acquirer Firms | Matched Acquirer Firms | UnCDID | Acquirer Firms | Matched Acquirer Firms | Matched Acquirer Firms | UnCDID |
| Effective M&A UnConstrained | 0.111 ** | 0.048 *** | 0.064 | -0.060 | 0.017 | -0.076 |
| | (0.052) | (0.015) | (0.054) | (0.050) | (0.015) | (0.052) |
| Constrained | 0.109 *** | 0.035 ** | 0.074 *** | 0.011 | 0.070 *** | -0.020 | 0.090 *** | 0.166 ** |
| | (0.021) | (0.016) | (0.026) | (0.070) | (0.022) | (0.016) | (0.027) | (0.068) |
| Highly UnConstrained | 0.067 | 0.047 *** | 0.020 | -0.129 ** | 0.016 | -0.146 ** |
| | (0.068) | (0.018) | (0.070) | (0.065) | (0.018) | (0.067) |
| Highly Constrained | 0.097 *** | 0.073 *** | 0.023 | 0.003 | 0.066 *** | -0.025 | 0.091 *** | 0.237 ** |
| | (0.022) | (0.022) | (0.031) | (0.103) | (0.024) | (0.022) | (0.033) | (0.098) |

| Panel C: Ln(LTDebtIssue) 6-Qrts Post - Ln(LTDebtIssue) 1-Yr Prior | Panel D: Ln(LTDebtIssue) 8-Qrts Post - Ln(LTDebtIssue) 1-Yr Prior |
|---------------------------------------------------------------|---------------------------------------------------------------|
| Acquirer Firms | Matched Acquirer Firms | Matched Acquirer Firms | UnCDID | Acquirer Firms | Matched Acquirer Firms | Matched Acquirer Firms | UnCDID |
| Effective M&A UnConstrained | -0.109 ** | -0.012 | -0.097 * | -0.156 *** | -0.034 ** | -0.122 ** |
| | (0.052) | (0.015) | (0.053) | (0.053) | (0.015) | (0.054) |
| Constrained | 0.048 *** | -0.072 *** | 0.120 *** | 0.217 *** | 0.034 | -0.104 *** | 0.138 *** | 0.260 *** |
| | (0.022) | (0.017) | (0.028) | (0.070) | (0.022) | (0.017) | (0.027) | (0.071) |
| Highly UnConstrained | -0.155 ** | -0.011 | -0.144 ** | -0.200 *** | -0.031 * | -0.169 ** |
| | (0.068) | (0.019) | (0.069) | (0.069) | (0.019) | (0.070) |
| Highly Constrained | 0.050 ** | -0.050 ** | 0.100 *** | 0.244 ** | 0.035 | -0.094 *** | 0.130 *** | 0.298 *** |
| | (0.024) | (0.024) | (0.034) | (0.101) | (0.023) | (0.023) | (0.031) | (0.102) |
Table XII: Change in capital expenditure and R&D expense, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the natural log of capital expenditure and R&D expense (CapExRD) two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirers and its matched non-acquirers. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Firms are classified as highly unconstrained (constrained) if it falls into the bottom (top) quintile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

| Panel A: Ln(CapExRD) 2-Qrts Post | Panel B: Ln(CapExRD) 4-Qrts Post |
|---------------------------------|---------------------------------|
| - Ln(CapExRD) 1-Yr Prior        | - Ln(CapExRD) 1-Yr Prior        |
| ----                            | ----                            |
| Acquirer (i)                    | Acquirer (i)                    |
| Matched Firms (ii)              | Matched Firms (ii)              |
| Acquirer (iii)                  | Acquirer (iii)                  |
| Matched (iv)                    | Matched (iv)                    |
| UnConstrained                   | UnConstrained                   |
| **-0.075***                     | **-0.170***                     |
| (0.026)                         | (0.027)                         |
| Constrained                     | Constrained                     |
| **0.074***                      | **0.032**                       |
| (0.014)                         | (0.016)                         |
| Highly UnConstrained            | Highly UnConstrained            |
| **-0.082**                      | **-0.159**                      |
| (0.034)                         | (0.035)                         |
| Highly Constrained              | Highly Constrained              |
| **0.088***                      | **0.049**                       |
| (0.017)                         | (0.019)                         |

| Panel C: Ln(CapExRD) 6-Qrts Post | Panel D: Ln(CapExRD) 8-Qrts Post |
|---------------------------------|---------------------------------|
| - Ln(CapExRD) 1-Yr Prior        | - Ln(CapExRD) 1-Yr Prior        |
| ----                            | ----                            |
| Acquirer (i)                    | Acquirer (i)                    |
| Matched Firms (ii)              | Matched Firms (ii)              |
| Acquirer (iii)                  | Acquirer (iii)                  |
| Matched (iv)                    | Matched (iv)                    |
| UnConstrained                   | UnConstrained                   |
| **-0.279***                     | **-0.361***                     |
| (0.032)                         | (0.032)                         |
| Constrained                     | Constrained                     |
| **-0.042**                      | **-0.086**                      |
| (0.018)                         | (0.018)                         |
| Highly UnConstrained            | Highly UnConstrained            |
| **-0.284**                      | **-0.357**                      |
| (0.042)                         | (0.041)                         |
| Highly Constrained              | Highly Constrained              |
| **0.020**                       | **-0.024**                      |
| (0.021)                         | (0.021)                         |
Table XIII: Change in cash holdings, using the propensity-score matched sample. For each actual acquirer, we use logit analysis (detailed in Appendix C) to find its five closest matches based on propensity score. Panel A reports the average difference between the cash holdings (cash/assets ratio) two quarters post M&A announcement and one-year prior for (i) the actual acquirer and (ii) its matched non-acquirers. Column (iii) reports the difference-in-difference between the actual acquirer and its matched non-acquirers. Column (iv) reports the difference-in-difference-in-difference between the actual constrained acquirer and its matched non-acquirers and the actual unconstrained acquirer and its matched non-acquirers. Firms are classified as unconstrained (constrained) if it falls into the bottom (top) tercile of FC5Pred one year prior to M&A. Firms are classified as highly unconstrained (constrained) if it falls into the bottom (top) quintile of FC5Pred one year prior to M&A. Panels B through D reports the difference in FC5Pred between 4, 6, and 8 quarters post M&A announcement and one year prior, respectively. Significance of each difference at the 10% level is indicated by *, 5% level by **, and 1% level by ***.

![Table XIII: Change in cash holdings, using the propensity-score matched sample.](content)

| Panel A: Cash Holdings 2-Qrts Post | Panel B: Cash Holdings 4-Qrts Post |
|-----------------------------------|-----------------------------------|
| - Cash Holdings 1-Yr Prior        | - Cash Holdings 1-Yr Prior        |
| **Acquirer**                      | **Acquirer**                      |
| (i)                               | (i)                               |
| **Firms**                         | **Firms**                         |
| (ii)                              | (ii)                              |
| **Matched**                       | **Matched**                       |
| (iii)                             | (iii)                             |
| **UnCDID**                        | **UnCDID**                        |
| (iv)                              | (iv)                              |
| Effective M&A                     | Effective M&A                     |
| UnConstrained                     | UnConstrained                     |
| -0.009 ***                        | -0.013 ***                        |
| (0.001)                           | (0.002)                           |
| Constrained                       | Constrained                       |
| -0.058 ***                        | -0.020 ***                        |
| (0.005)                           | (0.002)                           |
| Highly UnConstrained              | Highly UnConstrained              |
| -0.006 ***                        | -0.015 ***                        |
| (0.001)                           | (0.002)                           |
| Highly Constrained                | Highly Constrained                |
| -0.060 ***                        | -0.021 ***                        |
| (0.007)                           | (0.004)                           |

| Panel C: Cash Holdings 6-Qrts Post | Panel D: Cash Holdings 8-Qtrs Post |
|-----------------------------------|-----------------------------------|
| - Cash Holdings 1-Yr Prior        | - Cash Holdings 1-Yr Prior        |
| **Acquirer**                      | **Acquirer**                      |
| (i)                               | (i)                               |
| **Firms**                         | **Firms**                         |
| (ii)                              | (ii)                              |
| **Matched**                       | **Matched**                       |
| (iii)                             | (iii)                             |
| **UnCDID**                        | **UnCDID**                        |
| (iv)                              | (iv)                              |
| Effective M&A                     | Effective M&A                     |
| UnConstrained                     | UnConstrained                     |
| -0.008 ***                        | -0.020 ***                        |
| (0.002)                           | (0.002)                           |
| Constrained                       | Constrained                       |
| -0.063 ***                        | -0.027 ***                        |
| (0.005)                           | (0.003)                           |
| Highly UnConstrained              | Highly UnConstrained              |
| -0.004 **                         | -0.020 ***                        |
| (0.002)                           | (0.002)                           |
| Highly Constrained                | Highly Constrained                |
| -0.067 ***                        | -0.027 ***                        |
| (0.008)                           | (0.005)                           |
Figure 1: Daily buy-and-hold abnormal returns for [-21,21] day window around acquisition announcement date, benchmarked to day -21. Estimation of abnormal returns is based on the four-factor Carhart (1997) model over an estimation window of [-395,-30] days to allow for information leakage in the month prior to acquisition announcement.

Figure 2: Daily buy-and-hold abnormal returns for [-21,21] day window around acquisition announcement date for Constrained and UnConstrained acquirers, benchmarked to day -21. Estimation of abnormal returns is based on the four-factor Carhart (1997) model over an estimation window of [-395,-30] days to allow for information leakage in the month prior to acquisition announcement. Constrained (UnConstrained) firms are those with FC5Pred in the top (bottom) tercile of FC5Pred one year prior to acquisition. Panel A presents the graphs for the Constrained (Unconstrained) portfolios, respectively. Panel B further splits Constrained (UnConstrained) acquirers into those that make a diversifying acquisition (i.e., acquire a target outside of its 3-digit SIC industry) and those that make a focused acquisition (i.e., acquire a target within its 3-digit SIC industry). The difference between focused versus diversifying acquisitions for Constrained and UnConstrained firms are presented in this panel.