

Credit Derivatives and Firm Investment

George Batta and Fan Yu¹

Current Version: November 17, 2016

¹Batta and Yu are from Claremont McKenna College (gbatta@cmc.edu and fyu@cmc.edu). We are grateful to our colleagues at the CMC brownbag seminar for helpful comments. We also thank the Markit Group for supplying the CDS data used in this research.

Credit Derivatives and Firm Investment

Abstract

We examine the effect of credit default swap (CDS) introduction on firm investment, finding evidence of a decline in overall asset growth post-CDS trading driven primarily by a decrease in net debt issuance and M&A activities. Although we confirm Saretto and Tookes (2013)'s finding of higher firm leverage post-CDS, our analysis suggests that the expansion of credit supply by banks due to their CDS hedging is dominated by firms cutting back on debt financing for M&A activities in response to the empty creditor problem. These findings are largely robust to propensity score matching, instrumenting CDS introduction using lenders' FX hedging activities, and accounting for the possibility that CDS introduction is timed with M&A transactions.

1 Introduction

We revisit the finding in Saretto and Tookes (2013, ST hereafter) that firm leverage increases following the introduction of credit default swap (CDS) trading. ST argue that the existence of a CDS market facilitates lenders' transfer of credit risk to market participants, which can expand firms' access to credit. This expansion of credit should, in principle, allow firms to increase investment. However, we find that asset growth actually declines following CDS introduction, with most of the decline attributed to a sharp drop in mergers and acquisitions (as measured by cash paid for acquisitions, changes in goodwill, non-cash changes in capital stock, merger likelihood, merger count, and dollar value of mergers). We also find that net debt issuance falls following CDS introduction. These results, obtained using differences-in-differences estimation, are mostly robust to propensity score matching and instrumenting for CDS introduction. They do not seem to fit the simple view that the presence of CDS leads to an expansion in firms' credit supply.

Why are firms less inclined to issue debt and invest following CDS introduction? Hu and Black (2008a, 2008b) point out that lenders, by purchasing credit insurance, become "empty creditors" who are incentivized during debt renegotiation to push borrowers into bankruptcy or liquidation. While this might cause firms to pull back from issuing debt, Bolton and Oehmke (2011, BO hereafter) recognize that the presence of these hard-bargaining creditors actually reduces the likelihood that borrowers will engage in strategic default, which can increase firms' debt capacity. BO argue that debt outcomes primarily depend on whether "creditors are excessively tough even after factoring in these ex ante commitment benefits of CDS." To that end, they present conditions under which lenders will over-insure relative to the socially optimal amount of credit insurance, thus becoming "excessively tough." One scenario (BO's Corollary 4) has the creditor over-insure in order to capture the high expected renegotiation surplus in the event of a liquidity default. Another scenario (BO's Proposition 6) has multiple creditors over-insure in order to improve their positions against each other during debt renegotiation.

To see how these additional considerations might help explain our results, especially the sharp drop in M&A, we speculate that these deals typically require a large number of

creditors to finance, especially if they involve corporate bond issuance. Also, M&A deals are frequently motivated by an expectation of large synergy, which might imply a significant difference between the continuation and liquidation values of the acquired assets. In other words, these characteristics are associated with lenders' propensity to over-insure using CDS according to BO's analysis, which can lead to a more severe empty creditor problem. Firms then choose to cut back on debt issuance and M&A activities in anticipation of excessively tough-bargaining lenders post-CDS introduction.

Beyond these speculations, we conduct cross-sectional tests to disentangle the various effects as outlined above. First, we follow ST in using state-level debt defaults to measure portfolio shocks to lenders within the state in which the sample firm is headquartered. Presumably, the role of CDS in expanding firms' access to credit is likely more important just as these adverse shocks are hitting the local lenders. Second, we test BO's prediction that the ex ante commitment benefits are largest for firms with mostly intangible assets, among which creditors' bargaining position is weak and strategic defaults are likely to occur. Third, we focus on a subset of firms whose industry average Tobin's Q is high—the wedge between the market value and replacement value of assets, measured at the industry level, can be considered as a proxy for the renegotiation surplus in the event of a liquidity default. These firms are likely to have lenders who over-insure with CDS, thereby exacerbating the empty creditor problem. We find empirical evidence from net debt issuance consistent with the credit expansion hypothesis and the empty creditor hypothesis, but not the ex ante commitment benefit hypothesis. Unconditionally, though, the empty creditor concern seems to play a dominant role in explaining the effect of CDS introduction on net debt issuance.

To see how the presence of CDS trading influences the relation between debt financing and M&A activities, we examine the change in firm leverage around mergers. As expected, firm leverage typically increases after mergers, indicating that most mergers utilize some form of debt financing (either the issuance of new debt or the assumption of existing debt). However, this increase becomes much smaller after the beginning of CDS trading. Meanwhile, we document a post-CDS shift towards stock-based mergers. Combined with earlier results on the declining frequency and dollar value of M&A post-CDS trading, this finding suggests that the presence of CDS impacts corporate investment primarily by making debt less appealing

as a form of financing for M&A activities.

In further robustness tests, we examine the financing and investment variables separately for the partial year of CDS introduction and post-introduction years. We find some evidence of M&A activities and debt levels rising during the CDS introduction year, suggesting that the demand for CDS trading could be anticipating impending M&A deals. However, debt issuance and M&A activities become lower during the post-introduction years, and remain so after controlling for lagged M&A. Meanwhile, firm leverage is higher during the CDS introduction year and stays higher during the post-introduction years, consistent with ST's findings.

Our paper contributes to an expanding literature on the corporate finance implications of having a CDS market.¹ On credit pricing, Ashcraft and Santos (2009) highlight the tension between the CDS market's price discovery role in reducing information asymmetry, which can yield a lower cost of debt, and lenders' reduced monitoring incentive as a result of their CDS hedging, which can cause the cost of debt to rise.² They find that CDS introduction decreases (increases) the borrowing cost for lower (higher) risk borrowers, suggesting that the informational role of CDS dominates when bank monitoring is less of a concern. Consistent with this idea, Batta, Qiu, and Yu (2016) find that analysts' forecast error and dispersion decrease following CDS introduction. Kim (2015) finds that firms more likely to default strategically (e.g., high shareholder bargaining power, high liquidation costs, and low renegotiation frictions) see a larger reduction in credit spreads following CDS introduction, lending support to the ex ante commitment benefits of CDS as hypothesized by BO.

More closely related to our paper is the consistent body of evidence showing that bankruptcies and rating downgrades are more likely (Subrahmanyam, Tang, and Wang, 2014, STW14 hereafter), lenders are less willing to participate in distressed debt exchanges (Dannis, 2015) and more likely to loosen the collateral and net worth requirements on bank loans (Shan, Tang, and Winton, 2015), and borrowers are responding by saving more cash

¹A more complete review of this literature can be found in Augustin, Subrahmanyam, Tang, and Wang (2014).

²Das, Kalimipalli, and Nayak (2014) find that corporate bond market efficiency, quality, and liquidity decline following CDS introduction, which they attribute to a demographic shift of large institutional traders migrating from the bond market to the CDS market.

(Subrahmanyam, Tang, and Wang, 2016) and reducing the timeliness of their earnings in recognizing losses (Martin and Roychowdhury, 2015) following the inception of CDS trading. In accordance with these studies, our findings on curtailed debt issuance and M&A activities contribute to our understanding of the consequences of the empty creditor problem.

It is worth noting that Danis and Gamba (2015) extend the BO analysis to a dynamic setting while adding optimal debt/equity choice. Using simulation-based evidence, they find that under most scenarios, the availability of CDS leads to an increase in real investment. Although their result stands in contrast to our findings, we note that Danis and Gamba also project an increase in firm leverage that is much larger than that found by ST.³ It is possible that Danis and Gamba’s setup overweights the ex ante commitment benefit of CDS while underweights the ex post cost of inefficient debt renegotiation. For example, they do not consider the presence of multiple creditors, while BO have demonstrated that this feature significantly worsens the over-insurance problem in the CDS market.

Our study is also similar to Lemmon and Roberts (2010)’s analysis of the effect of a contracting credit supply on corporate financing and investment.⁴ They find that net investment falls nearly one-for-one with a drop in net long-term debt issuance, with no substitution into other forms of financing such as short-term debt and equity. Consequently, firms’ leverage ratios remain unchanged. In contrast, we find that the credit expansion brought on by lenders’ improved ability to hedge borrowers’ credit risk does not trigger an increase in debt issuance and investment. Instead, both debt issuance and investment are slowing down, with asset growth dropping as well, which results in increasing leverage. What prevents us from replicating Lemmon and Roberts’ simple result (albeit in the opposite direction) appears to be borrowers’ concern for the empty creditor problem when lenders purchase too much credit insurance.

Finally, Shan, Tang, and Yan (2015a) find that firms receive larger bank loans after they become CDS referenced, and the effect is primarily driven by cases where the lead

³ST (page 1192) estimate the increase in leverage ratio following CDS introduction to be between 0.9 and 5.5 percentage points. By comparison, the increase in market leverage in Danis and Gamba (2015) ranges between 7 and 17 percentage points depending on the different numerical scenarios.

⁴They exploit the collapse of Drexel Burnham Lambert Inc. in 1989 and its effect on the below-investment-grade credit supply as a natural experiment.

lender actively trades CDS. Since our measure of net debt issuance includes all forms of credit in firms' capital structures, such as publicly and privately placed bonds as well as bank loans, our evidence of a drop in net debt issuance complements Shan, Tang, and Yan's finding of larger bank loans. Specifically, it suggests that the various trade-offs brought by the introduction of CDS are likely to have differential impact on the components of firms' capital structure.⁵

The rest of our paper is organized as follows. Section 2 develops several hypotheses related to the effect of CDS introduction on firms' debt issuance and operating investment. Section 3 outlines the construction of the dataset and summarizes the variables used in the analysis as well as the methodologies. Section 4 presents the empirical results. Section 5 concludes.

2 Hypotheses

According to the extant literature, there are several ways in which the existence of a CDS market can affect debt market outcomes, which can include price-related terms such as yield spreads and bond liquidity, as well as non-price terms such as the amount of debt issued, debt maturity, and debt covenants. In this paper, we focus on the impact of CDS trading on the quantity of debt used as measured by a firm's net debt issuance, and how this affects the firm's operating investment.

ST offer an extensive discussion of the role of capital supply in firms' capital structure and investment decisions. The main reason why CDS trading can increase the supply of debt capital for borrowers, according to their discussion, is that purchasing CDS can provide regulatory capital relief to lenders. For example, the risk-weight for BBB-rated corporate bonds is 100 percent according to the standardized approach of Basel II (BCBS, 2001), while hedging with CDS sold by AA-rated counterparties will bring the risk-weight down to only 20 percent. This can dramatically boost lenders' profitability even after factoring in the CDS premiums that they have to pay.⁶ To empirically test this conjecture, ST

⁵This is echoed by ST, who find that most of the impact of CDS on firms' leverage ratios happens through corporate bonds rather than bank loans, thus reconciling their results with that of Hirtle (2009), who finds only weak evidence of CDS increasing the quantity of bank loans.

⁶Consistent with this argument, Shan, Tang, and Yan (2015b) find that banks' total assets increase, but

exploit the observation that a local bias is present in the preferences of both borrowers and lenders (Bharath, Dahiya, Saunders, and Srinivasan, 2007; Massa, Yasuda, and Zhang, 2013). Therefore, an increase in defaults among firms headquartered in the same state as the sample firm can be considered as a negative portfolio shock to local lenders that will reduce their willingness to lend to the sample firm.⁷ Under such a scenario, the ability to use CDS for regulatory capital relief is particularly helpful to the local lenders. Therefore, we hypothesize that:

H1a. The change in firms’ net debt issuance due to CDS introduction is more positive when their local lenders have experienced negative portfolio shocks.

Another potential reason why firms’ debt capacity might expand post-CDS is that buying credit protection acts as an “outside option” that enhances the bargaining power of creditors and reduces borrowers’ propensity to default strategically. This is what BO term the “ex ante commitment benefit of CDS.” When the amount of credit insurance that the lender purchases is chosen by the borrower, BO (Corollary 3) show that the presence of CDS increases the set of projects that can receive financing, and eliminates strategic default for some projects that can be financed even in the absence of CDS. For cross-sectional predictions, since intangible assets are costly to liquidate, we expect the ex ante commitment benefit of CDS to be particularly large for firms with a lot of intangible assets, among which the problem of strategic default could be severe in the absence of CDS. This leads to the following hypothesis:

H1b. The change in firms’ net debt issuance due to CDS introduction is more positive among those with a higher proportion of intangible assets.

In the same analysis, BO also note that there is an important difference between the amount of credit insurance chosen by the borrower for its lender and that chosen by the lender for itself. In the latter case, the lender has incentives to over-insure because by doing so, it can capture the bulk of the renegotiation surplus when it happens to be high, while the foregone surplus when renegotiation fails is only partially borne by the lender. BO also show that

their risk-weighted assets shrink, after they start using CDS.

⁷It is important to exclude the defaults of firms in the same industry as the sample firm. Otherwise, the measure of local credit supply shock could be directly influenced by the sample firm’s own credit quality.

having multiple creditors can exacerbate the over-insurance problem, because each creditor is seeking to strengthen its own bargaining position relative to other creditors as well as the firm, and now the cost of failed debt renegotiation is shared among an even larger group of claimholders. This tendency to over-insure, also called the “empty creditor problem,” seems to be responsible for the increasing likelihood of bankruptcies and failed debt renegotiations post-CDS that other researchers have found (see earlier discussions in the introduction). Naturally, it reduces firms’ demand for debt capital after CDS introduction. For cross-sectional implications, BO argue in their Corollary 4 that over-insurance is more severe when the average renegotiation surplus is high or the “upside potential” in the renegotiation surplus is high in the event of a liquidity default. To us, these characteristics can be proxied by the industry median Q ratios, since the wedge between market value and book/replacement value captures the likelihood and magnitude of high cash flows in the continuation state in BO’s model.⁸ Therefore, we hypothesize that:

H1c. The change in firms’ net debt issuance due to CDS introduction is more negative for those with a higher industry median Q ratio.

As two of the hypothesized effects expand the credit supply and one shrinks the credit demand, it becomes an empirical issue as to the direction of the overall effect on debt issuance. Since much of the available empirical evidence related to CDS introduction has underscored the empty creditor problem, we conjecture that the overall effect on debt issuance is negative. In other words, we suspect that the empty creditor channel plays a dominant role in determining debt outcomes:

H2. Firms’ net debt issuance declines after CDS introduction.

Lemmon and Roberts (2010) find a nearly one-for-one decline in net investment with the decline in net debt issuance given an exogenous contraction of credit supply, and that there is little substitution into alternative sources of capital such as internal reserves, trade credit, and equity. Therefore, we think that the preceding hypothesis regarding net debt

⁸Using the industry average allows this measure to be insensitive to the Q ratio of the sample firm, which can be negatively correlated with its likelihood of liquidity default. Presumably, a lower likelihood of liquidity default will diminish the empty creditor effect on firms’ capital structure and investment decisions.

issuance would apply just as well to corporate investment. However, all investments are not the same—certain types of investments, if financed by debt, will be particularly sensitive to the empty creditor problem. Notably, M&A activities usually involve debt financing with multiple creditors, and the acquired assets typically have higher expected value as part of the combined entity than on a standalone basis. If firms are concerned about excessively tough creditors emboldened by their CDS positions to capture most of the surplus during debt renegotiations, they are likely to cut back on these types of activities first and foremost. Therefore, we hypothesize that:

H3. Firms’ M&A activities fall after CDS introduction.

3 Data and Methodology

3.1 Data

Since we analyze the effect of CDS trading on firms’ financing and investment decisions, our sample is based on the standard non-financial Compustat/CRSP universe supplemented with CDS introduction dates obtained from Markit Group’s CDS database. Specifically, we obtain daily composite CDS premiums on five-year contracts written on senior unsecured obligations of North American reference entities. This process results in 554 CDS firms during the sample period between January 2001 and December 2013. The first date on which we have a five-year CDS premium observation for a given firm is defined as the date of CDS introduction for that firm.⁹ If CDS trading has already started on January 2 or January 3, 2001, then the CDS introduction date is treated as an unobserved earlier date. In addition to these CDS firms, our sample also includes 6,295 non-CDS firms that never experienced CDS trading during the sample period.¹⁰

Table 1 contains the definitions of all variables used in our analysis. Among the main variables of interest, CDSActive is a dummy variable equal to one if a firm has active CDS

⁹We base this characterization on five-year CDS premium observations because five-year contracts are typically the most liquid CDS maturity.

¹⁰Batta, Qiu, and Yu (2016) use a similar sample construction procedure, resulting in 739 CDS firms and 6,115 non-CDS firms. They have a shorter sample period (January 2001 to September 2010), but include financial firms and require I/B/E/S coverage due to their focus on price discovery in the CDS market and its effect on analyst forecasts.

trading by year t , and zero otherwise.¹¹ We measure firms' financing decisions using net debt issuance, changes in debt, and changes in cash holdings, and their investment decisions using net investment and changes in employee count. Following Lemmon and Roberts (2010), we divide net investment into three categories: net capital expenditure, cash paid for acquisitions, and other investment. Since investment generally results in asset growth, we also examine the changes in total assets.

An important category of net investment that we will be focusing on is mergers and acquisitions. To more broadly measure M&A activities, we include changes in goodwill,¹² non-cash changes in capital stock (excluding changes arising from stock-based compensation), and a merger dummy equal to one if cash paid for acquisitions or the non-cash change in capital stock is non-zero and zero otherwise, all of which are from Compustat. In addition, the sum of cash paid for acquisitions and the non-cash change in capital stock is defined as the M&A consideration. We also obtain the number of mergers and the dollar value of all mergers¹³ as reported in Thomson One Banker's M&A database.¹⁴ The unit of observations is a firm-year, since some of these variables are available only annually. To normalize the financing and investment variables, we divide them by the firm's total assets at the end of the period.

The next part of Table 1 contains control variables that have been used in the literature to explain either the likelihood of CDS introduction or corporate investment. For example, to account for the propensity of CDS trading, STW14 include total assets, equity volatility,

¹¹What this means is that if CDS trading began in June 2004, then our CDSActive variable would be equal to one starting from the year of 2005. In later analysis, we will also examine the partial year of CDS introduction (2004 in this example) separately from the post-introduction years.

¹²Changes in goodwill can also result from goodwill writedowns, but our results are robust to adding back goodwill writedowns (untabulated).

¹³We consider the value of all mergers as well as the value of mergers in which the acquirer and target are both publicly-traded firms. We are more confident of the second measure because M&A activities involving private firms are self-reported.

¹⁴While Compustat's cash paid for acquisitions variable provides some indication of M&A activities, Thomson One Banker captures pure stock-based acquisitions and offers a merger count variable. The downside of using Thomson One Banker is that its coverage of M&A activities may be limited—a quick search online shows that it collects data from league tables in the New York Times and the Wall Street Journal, which could imply a bias towards large acquisitions. Numerically, the fraction of firm-years with a merger is 22 percent using Thomson One Banker and 42 percent using cash paid for acquisitions being greater than zero. In any case, we ran all of our regressions with different merger indicators as the dependent variable and the results were very similar.

leverage, EBIT, working capital, cash holdings, asset turnover, retained earnings, PP&E, ROA, excess stock return, whether a firm is rated, and whether the rating is investment-grade. These variables may speak to firms' credit risk and hence investors' demand for CDS as a hedging instrument. Also, Chen and Chen (2012) use firms' cash flow and cash holdings, as well as Tobin's Q, to explain corporate investment.

The remainder of Table 1 includes a measure of lenders' FX hedging activities, conditioning variables used in cross-sectional tests to disentangle the channels in which CDS trading affects financing and investment (intangible assets, median industry Q, and state defaults), and lastly, variables used by ST in their examination of leverage changes around CDS introduction. We will discuss these variables when the related results are presented.

Panel B of Table 2 shows the number of firms that began CDS trading during each year of our sample period of 2001-13. The bulk of CDS initiations occurred during the years before the great financial crisis. The overall time-series pattern of CDS introductions is quite similar to that of Subrahmanyam, Tang, and Wang (2016). Their 901 CDS introductions over the 1997-2009 period include both financial and non-financial firms, while we exclude financial firms.

Panel A of Table 2 presents the summary statistics of all variables across CDS firm and non-CDS firms. Although we should always be cautious about over-interpreting univariate comparisons, a quick glance reveals that CDS firms tend to be much larger in terms of total assets, and are much more likely to be endowed with an investment-grade credit rating. They operate at a higher leverage and greater profitability (as measured by EBIT, ROA, and retained earnings), although the volatility of their stock returns is lower. Also, Tobin's Q is lower among firms with CDS than without. Overall, these univariate comparisons are consistent with the notion that the CDS firms are the more mature ones among the universe of all firms. Turning to the investment and financing variables, we do not see a distinct pattern when comparing the means of these variables across the CDS and non-CDS firms. Some measures of M&A activities, such as the non-cash change in capital stock and the value of M&A, are indeed lower among the CDS firms.

3.2 Methodology

To conduct a more rigorous analysis of the effect of CDS introduction on firms' investment and financing decisions, we estimate the following baseline regression specification:

$$y_{i,t} = \alpha_i + \beta_t + \gamma \text{CDSActive}_{i,t} + \theta' X_{i,t} + \epsilon_{i,t}, \quad (1)$$

where i and t represent firm and year, respectively. Among the included variables, y denotes various investment and financing measures, α firm fixed effects, β year fixed effects, X firm-level control variables, and ϵ the i.i.d. residual term.

This specification would allow us to correctly infer γ under the assumption that CDS introduction is exogenous to the left hand side variable y . To the extent that CDSActive is correlated with the residual ϵ , however, the estimate of γ cannot be interpreted as a causal effect. We address this concern in three ways. First, by including a large number of control variables related to both CDS introduction and firms' investment and financing decisions (collectively referred to as X above), the risk of having omitted variables driving both outcomes is reduced. Second, we adopt a well-documented instrumental variable for CDS introduction—the usage of FX derivatives by banks that served as lenders or underwriters for the sample firm during the preceding five years. Intuitively, banks that use one type of derivatives (FX) to hedge their risks are more likely to employ all types of derivatives (including CDS) for hedging. Moreover, factors that motivate FX hedging should be largely unrelated to firm-specific reasons for financing and investment. Therefore, we have in principle a strong IV that also satisfies the exclusion restriction.¹⁵ Third, to the extent that CDS introduction could be timing impending M&A transactions, we include an introduction-year dummy (CDS Partial Year) in addition to CDSActive (which equals one for all post-introduction years). This helps to parcel out the endogenous part of the relation between CDS introduction and the left hand side variable from the pre- and post-introduction observations.

Another concern with the baseline specification arises from earlier summary statistics showing that the CDS sample is quite different from the non-CDS sample, especially in terms of firm size. These large differences cast doubt on whether they can be adequately

¹⁵See Minton, Stulz, and Williamson (2009), ST, and STW14 for additional discussions regarding this instrumental variable.

controlled for with a linear specification. To address this issue, we use propensity score matching to identify control firms that have a similar likelihood of CDS introduction as the treatment firms, but did not actually experience CDS trading at the time of treatment. The matched and presumably more balanced sample is then used to perform the same panel regression.

Finally, we augment the baseline specification by interacting CDSActive with certain firm characteristic Z ; this is intended to disentangle the various channels through which CDS trading affects firms' investment and financing decisions:

$$y_{i,t} = \alpha_i + \beta_t + (\gamma_0 + \gamma_1 Z_{i,t}) \text{CDSActive}_{i,t} + \delta Z_{i,t} + \theta' X_{i,t} + \epsilon_{i,t}. \quad (2)$$

4 Empirical Results

4.1 Baseline Regressions

We begin our analysis by examining firms' investment and financing decisions using the panel regression setup of (1). We include as control variables those from STW14 for explaining CDS introduction and those from Chen and Chen (2012) for explaining corporate investment. The results are presented in Table 3.

First, we find that annual net debt issuance declines by an average of 1.2 percent of total assets after the beginning of CDS trading, and this estimate is significant at the one-percent level. It represents an economically significant effect as well, given that the sample average of net debt issuance is only 0.9 percent for CDS firms from Table 2. It suggests that firms are letting some of their debt mature without refinancing it with new debt. This result is not what we would expect to see if the main effect of CDS trading is to expand the credit supply. In spite of this drop in debt issuance, the annual *change* in firms' cash holdings increases by 1.1 percent of total assets post-CDS (also significant at the one-percent level), which is consistent with Subrahmanyam, Tang, and Wang (2016)'s finding that the *level* of cash holdings, measured as a percentage of total assets, increases by around 2.6 percent after CDS introduction.¹⁶ They explain their results by drawing on the Bolton, Chen, and Wang

¹⁶The average level of cash holdings of CDS firms, as a percentage of total assets, is 9.6 percent according to Table 2. This is quite close to the 8.5 percent cash ratio for CDS firms in Subrahmanyam, Tang, and Wang (2016)'s sample.

(2011) model of firm liquidity and risk management, conjecturing that CDS-referenced firms adopt more conservative liquidity policies to avoid negotiating with tough-bargaining empty creditors.

Second, we find that corporate investment generally falls after CDS introduction. Net investment, which is equal to the sum of net capital expenditure, cash paid for acquisitions, and other investments, falls by a moderate 0.4 percent of total assets after CDS trading begins. Among the components of net investment, while net capital expenditure shows a statistically significant increase, it is more than offset by the steeper decline in cash paid for acquisitions, which amounts to around one percent of total assets and is highly significant at the one-percent level. This is also economically significant with cash paid for acquisitions averaging only 2.3 percent of total assets for CDS firms. Apart from these direct measures of investment, we also find that firms cut back on hiring after CDS introduction (the change of employee count scaled by total assets decreases by 0.0001 and is significant at the one-percent level), which is consistent with the decline of a broadly interpreted corporate investment.

Third, since asset growth can be attributed to corporate investment in general and M&A activities in particular, we expect to see a decline in asset growth given the decrease of net investment and cash paid for acquisitions. A similar argument can be made given the importance of debt financing to asset growth. The first column of Table 3 confirms this, with the annual change of total assets being lower by 1.7 percent (significant at the five-percent level) during the post-CDS years. This is more than one third of the average value of asset growth for CDS firms, which equals 4.5 percent in Table 2.

Turning our attention to the included control variables, we find that firms generally issue more debt, increase cash holdings faster, invest more (including pursuing more M&A activities), and their assets grow faster, when they are more profitable (with higher EBIT and excess stock returns) and their default risk is lower (with lower leverage and stock return volatility and investment-grade credit rating).

Because of the rather prominent post-CDS decline in cash paid for acquisitions, we decide to examine firms' M&A activities in greater detail, using a range of variables from Compustat as well as Thomson One Banker's M&A database. These results are presented in Table 4.

In the first four columns of Table 4, we examine variables from Compustat: changes

in goodwill, which are typically associated with premiums paid in acquisitions; non-cash changes in capital stock, which may reflect stock-based acquisitions; and a merger dummy equal to one if either the cash paid for acquisitions or the non-cash change in capital stock is non-zero. For the merger dummy, either a linear probability model or a conditional logit model is estimated. In the next three columns we use variables from Thomson One Banker: the merger count; the value of all M&A transactions; and the value of M&A transactions in which both parties are publicly-traded firms.

Focusing on the coefficients of CDSActive, we identify a rather uniform decline in all of the M&A measures during the post-CDS years. For example, the annual change in goodwill drops by 1.1 percent of total assets, which is significant at the one-percent level. Somewhat smaller than the decline in cash paid for acquisitions, we find that the non-cash change in capital stock drops by around 0.5 percent of total assets, which is nonetheless significant at the five-percent level and compares substantially with the average of non-cash change in capital stock of 2.1 percent among CDS firms. Similarly, in both the linear probability model and the conditional logit model, the likelihood of mergers experiences highly significant reductions. For instance, the likelihood of mergers decreases by 0.091 in the linear probability model, relative to an average of 0.361 for the merger dummy among CDS firms.¹⁷

From Thomson One Banker, the merger count decreases by 0.18 but is not significant. The value of all M&A transactions decreases by 2.5 percent of total assets and is significant at the five-percent level. Lastly, the value of public-public M&A declines by a whopping 12.5 percent of total assets and is significant at the one-percent level. Both of these reductions in the dollar value of mergers are substantial when compared to their respective sample means for CDS firms.¹⁸ These three variables are measured on an annual basis, and are coded as missing if no merger was found during the year. Because of this, the sample sizes associated with these variables are much smaller compared to those using the Compustat variables. Still, we find that M&A activities can be explained by the included control variables in

¹⁷We also evaluate the marginal effect of the CDSActive coefficient in the conditional logit model, setting all other covariates to their sample means, except Rated and Investment-grade, which are set to their modal values. This shows that the probability of a merger decreases by 0.097, similar to the LPM-based result.

¹⁸Table 2 shows that among CDS firms, the average merger count is 2.2, the average value of all mergers is 9.3 percent of total assets, and the average value of public-public mergers is 15.7 percent of total assets, suggesting that the latter ones are potentially much larger deals than the average merger.

much of the same way that they explain debt issuance and investment in Table 3. Notably, firms with higher profitability (EBIT), higher excess stock returns, and larger cash holdings, as well as lower default risk (leverage and stock return volatility), are associated with higher M&A activities.

4.2 Propensity Score Matching

In this subsection, we repeat the preceding baseline panel regressions using propensity score matched samples. Specifically, the propensity scores are computed according to a probit model of CDS introduction, using most of the variables included by ST and STW14.¹⁹ For each CDS firm observed before its CDS initiation year (treatment), we identify its nearest neighbor in terms of propensity score (control) among either non-CDS firms or CDS firms that have experienced CDS introduction only after that year. As the summary statistics of Table 2 show, CDS and non-CDS firms are quite different in terms of size, leverage, profitability, and credit rating, among other dimensions. By including other CDS firms in the matching procedure, the matching performance is likely to be improved.²⁰ Indeed, 28.7 percent of our nearest-neighbor matches are CDS firms. When a match is found (with replacement), we include its entire time-series of observations in the matched sample.

In Table 5, we evaluate the performance of the propensity score matching procedure. In Panel A, we compare the model estimates using either the pre-matching or post-matching sample. From the pre-matching sample, we find that larger firms with investment-grade ratings and higher leverage ratios are more likely to experience CDS introduction, consistent with the findings of ST and STW14. When using the post-matching sample, the estimated coefficients decrease in magnitude and statistical significance, and the pseudo- R^2 drops precipitously, suggesting that firms in the post-matching sample are more homogeneous. Further indication that the matching is effective can be found in Panel B, which shows that the propensity scores are very similar across the treatment and control observations. In the same panel, we also compare the firm characteristics across the two groups. In contrast

¹⁹In this probit model, the dependent variable is equal to 0 before CDS introduction for CDS firms, 1 at CDS introduction, and treated as missing afterwards. For non-CDS firms, the dependent variable is always 0.

²⁰Note that both ST and STW14 consider only non-CDS firms in their matching procedure, although ST restrict their overall sample to S&P 500 firms only.

to the summary statistics across CDS and non-CDS firms in Table 2, there is no longer a statistically significant difference among any of the firm characteristics.

In Table 6, we replicate the analysis presented in Table 3 pertaining to the effect of CDS introduction on firms' debt financing and investment decisions. It shows that net debt issuance, cash paid for acquisitions, the change in employee count, and asset growth continue to be lower post-CDS trading. Although the declines are a bit smaller in magnitude (except for that of asset growth), they remain highly significant. In Table 7, we replicate the in-depth analysis of M&A transactions in Table 4. The conclusion here is also unchanged: post-CDS trading, the change in goodwill, the non-cash change in capital stock, the likelihood and count of mergers, as well as the dollar value of public-public mergers, are all significantly lower. The magnitude of these decreases is similar to those in Table 4. Overall, our previous findings of lower debt issuance, corporate investment (specifically M&A activities), and asset growth are robust to using a propensity score matched sample.

4.3 Instrumental Variable Regressions

Next, we use an instrumental variable regression approach to address the possible endogeneity of CDS introduction to firms' financing and investment activities. We thank Dragon Tang for sharing his lender FX usage variable, which we explained in Section 3.2. Since his data only extends to the end of 2009, we limit our analysis in this subsection to the sample period of 2001-09, instead of using our original sample period of 2001-13.

In the first stage of the procedure, we need to generate a predicted value for CDSActive, which is itself a dichotomous variable that takes the value of 1 post-CDS and 0 before. Therefore, we estimate a probit model of CDS trading and present the results in the appendix. There are a few subtle differences between this probit model and the one we estimated in the propensity score matching procedure. First, the sample period here is limited to 2001-09. Second, this version includes the lender FX usage (the instrument) as one of the explanatory variables. Third, we are predicting the likelihood of CDS trading (CDS continues to trade past its initiation year) here, while in the PSM probit model we are predicting the likelihood of CDS introduction (the data are truncated after CDS initiation). From the results in the appendix, we find that lender FX usage is positively related to CDS trading and the

coefficient is significant at the one-percent level, confirming lender FX usage as a strong instrument. The results are otherwise similar to those from predicting CDS introduction in Table 5.

The second stage results are then presented in Table 8, in which we combine the investment and financing variables from Tables 3 and 4, dropping some of the variables due to the limitation of page width.²¹ With the exception of the non-cash change in capital stock and the merger count, all of the variables exhibit a statistically significant decline after the beginning of CDS trading. Most of these estimates are actually larger in size than their counterparts from Tables 3 and 4. For example, the estimated decrease for net debt issuance, cash paid for acquisitions, the change in total assets, the merger likelihood (LPM), and the value of M&A are 4.1, 3.0, 2.8, 16.8, and 12 percent, respectively. These estimates can be compared with those from Tables 3 and 4, which are 1.2, 1.0, 1.7, 9.1, and 2.5 percent, respectively. Therefore, our results are also robust to the use of instrumental variable regressions.

4.4 Cross-Sectional Tests

Even though we have demonstrated that debt issuance and M&A transactions are falling after the inception of CDS trading, we still need to disentangle the specific mechanisms through which CDS trading affects firms' financing and investment decisions. As discussed in Section 2, we consider three separate mechanisms: credit supply expansion due to the role of CDS in providing regulatory capital relief to lenders; the ex ante commitment benefit of CDS in reducing strategic default by borrowers; and creditors who over-insure with CDS and are willing to push borrowers into bankruptcy and liquidation. To test each of these possibilities, we estimate panel regressions specified in (2), with net debt issuance as the left hand side variable as well as a conditioning characteristic Z selected to delineate a specific mechanism.²²

First, we let Z be an indicator that equals one if a firm's ratio of intangible assets to total

²¹The ones being dropped are other investments, the change in cash, the merger dummy (conditional logit), and the dollar value of public-public mergers.

²²In additional untabulated results, we include several investment measures as the dependent variable and the findings are similar to what we present below on net debt issuance.

assets is above the 75th percentile of all firm-years, and zero otherwise. We use the 75th percentile to set the partition because the median level of intangible assets is zero. Such firms are prone to strategic default because they are likely to face high liquidation costs. The ex ante commitment benefit of CDS implies that these firms would see an increase of debt capacity post-CDS. However, the interaction between the conditioning variable and CDSActive is not significant in either of the first two columns of Table 9.²³

Second, we let Z be a dummy variable equal to one if a firm-year’s median industry Q is above the median of median industry Q across all firm-years. As the median industry Q proxies for the expected renegotiation surplus in a liquidity default, the creditors of such firms are likely to over-insure their positions, turning them into empty creditors and increasing the firms’ probability of bankruptcy. In the third and fourth columns of Table 9, we find that the interaction between the conditioning variable and CDSActive has a negative coefficient significant at the one-percent level. Comparing its magnitude with the coefficient on CDSActive, we see that it more than doubles the decline of net debt issuance after CDS introduction. This is therefore an economically significant effect as well.

Third, we define Z as the ratio of defaulted debt over all debt for firms incorporated in the same state as the sample firm (see Table 1 for the more detailed definition). A higher value of Z would represent a more severe shock to in-state lenders’ loan portfolios. To the extent that the sample firm borrows primarily from in-state lenders, the credit expansionary effect of CDS will be particularly large when Z is high. The last two columns of Table 9 confirm this conjecture, although the interaction between Z and CDSActive is only marginally significant.²⁴ Moreover, the weakly positive estimate is not large enough to overcome the highly significant negative coefficient on CDSActive itself.

Considering the results of all three tests, it seems that both the empty creditor and the credit supply expansion mechanisms are at work in our sample, although the former plays a dominant role, causing net debt issuance to be lower during post-CDS years.

²³Due to the difficulties in explaining the behavior of zero-leverage firms (Strebulaev and Yang, 2013), we perform one regression for the entire sample and another with zero-leverage firms removed.

²⁴Our State Default measure uses information on defaulted debt from Moody’s Default and Recovery Database only up to 2010. In contrast to ST’s Bloomberg data, we only include the defaults of rated companies and these amount to a quarter of the defaults considered by ST. This difference could have accounted for our weaker results.

4.5 Leverage Change around Mergers

Mergers are typically associated with a significant increase in firm leverage, which indicates the importance of debt financing in fueling M&A activities. This is also consistent with an increase in debt capacity following mergers, perhaps as a result of the coinsurance effect lowering the default risk of the merged firm (Ghosh and Jain, 2000). In this subsection, we will examine the change of firm leverage around M&A activities, and compare the changes before and after the introduction of CDS trading.

Table 10 presents the related results, with either (net) book or (net) market leverage as the dependent variable. We include the total M&A consideration (defined as the sum of cash paid for acquisitions and the non-cash change in capital stock) as a control of the size of mergers, since deal size could be different pre- and post-CDS and smaller deals presumably do not rely as much on debt financing. We first notice that the coefficient on the merger dummy (defined as one if either cash paid for acquisitions or the non-cash change in capital stock is nonzero) is positive and highly significant, as is the coefficient on total M&A consideration. This confirms that firm leverage generally increases after mergers and the increase is larger for bigger deals. Then, we find that the coefficient on the interaction between the merger dummy and CDSActive is negative and significant. When market leverage is used, the sum of these two coefficients, reflecting the change in leverage around mergers in the presence of CDS trading, remains positive. When book leverage is used instead, the sum of the two coefficients turns negative. In one interpretation, these results are consistent with CDS trading reducing the attractiveness of debt as a form of financing for mergers. Alternatively, CDS trading diminishes the extent to which debt capacity expands following mergers.

In the last column of Table 10, we examine the share of M&A consideration that is attributed to non-cash changes in capital stock as a dependent variable. The conjecture is that firms would favor stock-based mergers if the empty creditor concern due to the presence of CDS is reducing the appeal of debt financing for M&A transactions. The results indicate that this is indeed the case, with the share of total M&A consideration due to non-cash changes in capital stock increasing by about 3.5 percentage points post-CDS trading.²⁵ As

²⁵In untabulated results, we find that cash paid for acquisitions is most closely correlated with net debt issuance (with a correlation of 0.3), while its correlation with the change in cash is -0.07, and its correlations

a point of reference, Table 2 shows that this share averages 39 percent for CDS firms in our sample.

4.6 CDS Introduction Year vs Post-Introduction Years

In our analysis, we define CDSActive as equal to one for post-introduction years, while ST define their CDS Trading as one if there is active CDS trading during a given year. The reason why we define our variable this way is that the effect of CDS trading on firms' financing and investment decisions may take a while to appear as borrowers and lenders respond to the availability of CDS. On the other hand, if the demand for CDS trading reflects investors' anticipation of forthcoming corporate investment decisions, such as debt issuance and M&A, CDS introduction and these firm decisions could become concurrent. To sort out these effects, we include a partial year dummy corresponding to the year of CDS introduction in addition to the original CDSActive indicator.

Panel A of Table 11 presents the results of these estimations. We notice that during the year of CDS introduction, net investment, cash paid for acquisitions, the value of M&A transactions, and the change in debt are all increasing significantly relative to the pre-introduction baseline. Although we cannot offer any definitive proof, this is at least consistent with CDS being introduced to time impending M&A events.²⁶ Turning now to the post-introduction dummy of CDSActive, we find that cash paid for acquisitions, the merger likelihood (LPM), net debt issuance, and the change in debt have all declined post-CDS, similar to our earlier findings.

To the extent that firms' financing and investment decisions are influenced by past M&A

with current and lagged equity issuance, as well as lagged debt issuance are much lower. This suggests that the cash used to pay for acquisitions is coming from existing cash holdings and, more importantly, proceeds from debt issuance in the current fiscal year. Also, the correlation of the non-cash change in capital stock with the value of M&A (the Thomson One measure) is 0.48, while the correlation of the value of M&A with cash paid for acquisitions is 0.45. This suggests that our measures are indeed capturing the different M&A components as we intended. In any event, we re-estimate this regression while controlling for the change in cash and current and lagged equity issuance as well as lagged net debt issuance. Note that we deliberately leave out the contemporaneous net debt issuance. The results on the M&A stock share remain virtually unchanged.

²⁶Since a large fraction of CDS introductions took place in the first half of the year, this is also consistent with an expansion of credit supply in the second half of the year due to the presence of CDS trading, albeit this effect is only limited to the partial CDS introduction year and seems to be reversed in subsequent years, as we document below.

activities, we include up to three lags of M&A considerations in our regressions and present the results in Panel B. Here, we find that cash paid for acquisitions and the non-cash change in capital stock are negatively related to past M&A. On the other hand, the change in debt is positively related to past M&A. Controlling for these patterns seems to weaken the CDS introduction year effects, while the coefficients on CDSActive remain negative and significant for cash paid for acquisitions, the merger dummy, net debt issuance, and the change in debt.

4.7 Replicating ST’s Results on Post-CDS Leverage Changes

The last set of results we present are replications of ST’s leverage regressions using book leverage and market leverage. In light of our evidence documenting the reduction of net debt issuance and M&A activities, as well as the slowdown in asset growth, it remains unclear how firm leverage will respond to CDS trading. Nonetheless, ST have shown extensively that firm leverage increases after CDS introduction. Therefore, we attempt to replicate their results on leverage by following closely their regression specification.

Specifically, we regress book or market leverage on a list of explanatory variables largely the same as those used by ST. The definitions of these variables can be found near the end of Table 1. The only ones from their list that we do not include are whether the firm has a commercial paper program, and the principal-weighted average maturity of the firm’s debt. To this list, we add up to three lags of past M&A considerations, as well as the CDS introduction year dummy and CDSActive.

Table 12 shows that firm leverage increases sharply during the CDS introduction year by around 2-3 percentage points relative to the pre-introduction baseline. There is also a similar increase during the post-introduction years, but this increase is somewhat smaller and less significant. Our estimates are quite close in magnitude to the differences-in-differences estimates of leverage changes given in ST’s Table 6.

5 Conclusion

Motivated by ST’s credit supply expansion hypothesis and their finding of higher firm leverage following CDS introduction, we examine how CDS trading affects corporate investment

and financing decisions. Yet we find that firms' net debt issuance and M&A activities fall and their asset growth slows down post-CDS introduction. These results survive regressions using propensity score matched samples as well as instrumental variable regressions. Further analysis reveals that the expansion of firms' debt capacity following mergers is weakened by the presence of CDS trading. Moreover, cross-sectional tests are consistent with CDS expanding firms' credit supply as well as CDS engendering a concern for empty creditors, with the latter playing a dominant role in determining how CDS trading influences corporate investment and debt financing. While we are able to replicate ST's results on leverage increasing following CDS introduction, our other results suggest that this occurred when asset growth falls as a result of firms cutting back on debt financing and M&A activities.

References

- [1] Augustin, P., M. Subrahmanyam, D. Tang, and S. Wang. 2014. Credit default swaps (CDS): A survey. *Foundations and Trends in Finance* 9(1-2):1-196.
- [2] Ashcraft, A., and J. Santos. 2009. Has the CDS market lowered the cost of corporate debt? *Journal of Monetary Economics* 56:514-523.
- [3] Batta, G., J. Qiu, and F. Yu. 2016. Credit derivatives and analyst behavior. *Accounting Review* 91:1315-1343.
- [4] BCBS. 2001. The standardised approach to credit risk. Bank of International Settlement, Basel, Switzerland.
- [5] Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan. 2007. So what do I get? The bank's view of lending relationships. *Journal of Financial Economics* 85:368-419.
- [6] Bolton, P., H. Chen, and N. Wang. 2011. A unified theory of Tobin's q , corporate investment, financing, and risk management. *Journal of Finance* 66:1545-1578.
- [7] Bolton, P., and M. Oehmke. 2011. Credit default swaps and the empty creditor problem. *Review of Financial Studies* 24:2617-2655.
- [8] Chen, H., and S. Chen. 2012. Investment-cash flow sensitivity cannot be a good measure of financial constraints: Evidence from the time series. *Journal of Financial Economics* 103:393-410.
- [9] Danis, A. 2015. Do empty creditors matter? Evidence from distressed exchange offers. Working Paper. Georgia Institute of Technology. Forthcoming in *Management Science*.
- [10] Danis, A., and A. Gamba. 2015. The real effects of credit default swaps. Working Paper. Georgia Institute of Technology.
- [11] Das, S., M. Kalimipalli, and S. Nayak. 2014. Does CDS trading improve the market for corporate bonds? *Journal of Financial Economics* 111:495-525.

- [12] Ghosh, A., and P. C. Jain. 2000. Financial leverage changes associated with corporate mergers. *Journal of Corporate Finance* 6:377-402.
- [13] Hirtle, B. 2009. Credit derivatives and bank credit supply. *Journal of Financial Intermediation* 18:125-150.
- [14] Hu, H. T. C., and B. Black. 2008a. Debt, equity, and hybrid decoupling: Governance and systemic risk implications. *European Financial Management* 14:663-709.
- [15] Hu, H. T. C., and B. Black. 2008b. Equity and debt decoupling and empty voting II: Importance and extensions. *University of Pennsylvania Law Review* 156:625-739.
- [16] Kim, G. H. 2015. Credit derivatives as a commitment device: Evidence from the cost of corporate debt. Working Paper. Warwick Business School.
- [17] Lemmon, M., and M. R. Roberts. 2010. The response of corporate financing and investment to changes in the supply of credit. *Journal of Financial and Quantitative Analysis* 45:555-587.
- [18] Martin, X., and S. Roychowdhury. 2015. Do financial market developments influence accounting practices? Credit default swaps and borrowers' reporting conservatism. *Journal of Accounting and Economics* 59:80-104.
- [19] Massa, M., A. Yasuda, and L. Zhang. 2013. Supply uncertainty of the bond investor base and the leverage of the firm. *Journal of Financial Economics* 110:185-214.
- [20] Minton, B., R. Stulz, and R. Williamson. 2009. How much do banks use credit derivatives to hedge loans? *Journal of Financial Services Research* 35:1-31.
- [21] Saretto, A., and H. E. Tookes. 2013. Corporate leverage, debt maturity, and credit supply: The role of credit default swaps. *Review of Financial Studies* 26:1190-1247.
- [22] Shan, S., D. Tang, and A. Winton. 2015. Market versus contracting: Credit default swaps and creditor protection in loans. Working Paper. Shanghai Advanced Institute of Finance.

- [23] Shan, S., D. Tang, and H. Yan. 2015a. When is CDS trading innocuous? Working Paper. Shanghai Advanced Institute of Finance.
- [24] Shan, S., D. Tang, and H. Yan. 2015b. Regulation-induced financial innovation: The case of credit default swaps and bank capital. Working Paper. Shanghai Advanced Institute of Finance.
- [25] Strebulaev, I. A., and B. Yang. 2013. The mystery of zero-leverage firms. *Journal of Financial Economics* 109:1-23.
- [26] Subrahmanyam, M., D. Tang, and S. Wang. 2014. Does the tail wag the dog? The effect of credit default swaps on credit risk. *Review of Financial Studies* 27:2927-2960.
- [27] Subrahmanyam, M., D. Tang, and S. Wang. 2016. Credit default swaps, exacting creditors, and corporate liquidity management. Working Paper. University of Hong Kong. Forthcoming in the *Journal of Financial Economics*.

Table 1: Definitions of variables

Variable	Definition
CDSActive	A dummy variable equal to one starting the first full fiscal year in which a firm has CDS trading, and for all fiscal years thereafter. The variable is equal to zero otherwise.
CDS Partial Year	A dummy variable equal to one for the first fiscal year in which a firm has CDS trading, and equal to zero otherwise.
Δ Assets	The year-over-year change in assets (at), scaled by assets (at).
Net Investment	Capital expenditures (capx) less PPE sales (sppe) plus cash paid for acquisitions (aqc) plus increase in investments (ivch) less sale of investments (siv), scaled by assets (at).
Net Capex	Capital expenditures (capx) less PPE sales (sppe), scaled by assets (at).
Cash for Acquisitions	The cash paid for acquisitions, from the cash flow statement, scaled by assets (at).
Other investment	Increase in investment (ivch) less sale of investment (siv), scaled by assets (at).
Δ Cash	Change in cash and cash equivalents and short-term investments (che), scaled by (at).
Δ Employees	Change in employee count (emp), scaled by assets (at).
Net Debt Issuance	Debt issuance (dltis) less debt repayments (dltr) plus change in short-term debt (dlcch), scaled by assets (at).
Δ Debt	Change in the sum of debt in current liabilities (dlc) and long-term debt (dltt), scaled by assets (at).
Δ Goodwill	The change in goodwill, scaled by assets (at).
Δ Noncash Capital Stock	The change in shareholders equity (ceq) less the change retained earnings, minus sale of common and preferred stock (sstk), less purchase of common and preferred stock (prstkc), less stock-based compensation expense (stkco), scaled by assets (at), with negative values coded as zero.
Merger dummy	A dummy equal to one if Cash for Acquisitions or Noncash Δ in Capital Stock is greater than zero, and equal to zero otherwise.
Merger count	The number of mergers reported in ThomsonOne Banker during the fiscal year. Coded as missing if no mergers were found.
Value of M&A	Value of all M&A transactions reported in ThomsonOne Banker during the fiscal year in which the acquiring firm retained majority control, scaled by total assets.
Value of M&A, public-public	Value of M&A transactions reported in ThomsonOne Banker during the fiscal year in which the acquiring firm retained majority control, and where both parties were publicly-traded firms, scaled by total assets.
M&A Consideration	The sum of Cash for Aqc. and Noncash Δ in Capital Stock.
$\ln(\text{Assets})$	The natural logarithm of total assets (at) of a firm, in billions of dollars.
Net PPE	Net Property, plant, and equipment (ppent), scaled by assets.
Book Leverage	The book value of debt (dlc + dltt) divided by total assets (at).
EBIT	Earnings before interest and taxes (pi + xint), scaled by assets (at).
Working Capital	Current assets (act) less current liabilities (lct), scaled by assets (at).
Cash	Cash holdings (che), scaled by assets (at).
Asset Turnover	Sales (sale), scaled by assets (at).
Retained Earnings	Retained earnings (ret), scaled by assets (at).
ROA	Net income before extraordinary items and discontinued operations (ib), scaled by assets (at).
Volatility	Annualized standard deviation of trailing 252-day stock returns, as of the month before current year earnings are announced.
Excess Stock Return	Compounded 12-month stock returns less the compounded 12-month returns from the CRSP value-weighted index.
Investment-grade	A dummy variable equal to one if a firm has a long-term S&P issuer-level credit rating above BB+, and zero otherwise.
Rated	A dummy variable equal to one if a firm has an active long-term S&P issuer-level credit rating, and zero otherwise.
Q	Tobin's Q, as defined in Chen and Chen (2012). Computed as (market capitalization (from CRSP) + lt + pstk - txditc - (at - ppent)) / ppent.
Lender FX Usage	The amount of foreign exchange derivatives used for hedging (not trading) purposes relative to total assets of the bank holding companies that a firm has done business with

	during the past five years. The final variable is computed as the average across all banks that have served either as bond underwriter (based on the Mergent FISD database) or a lead syndicate member (based on Dealscan) over the past five years.
Above 75th percentile intangibles	A dummy variable equal to one if a firm's intangibles to assets is above the 75 th percentile of all firm-years, and zero otherwise
Above Median of Median Industry Q	A dummy variable equal to one if a firm-year's Median Industry Q is above the median of Median Industry Q for all firm-years, and zero otherwise.
Median Industry Q	The median of Q for each firm-year, by GICS industry.
State Defaults	The sum of defaulted total debt (dltt + dlc) for all Compustat firms headquartered in the firm's state each year, less the defaulted debt for all firms in the same SIC 3-digit industry headquartered in that state in that year, divided by the sum of total debt for all Compustat firms headquartered in the firm's state each year. The default data is obtained from Moody's Default and Recovery Database, through fiscal 2010.
Δ Book Leverage	The annual change in book leverage.
Δ Net Book Lev.	The annual change in net book leverage, equal to total debt (dltt + dlc) less cash and short-term investments (che) divided by total assets (at).
Δ Market Lev.	The annual change in net market leverage, equal to total debt (dltt + dlc), divided by total debt plus market capitalization (from CRSP).
Δ Net Market Lev.	The annual change in net market leverage, equal to total debt (dltt + dlc), less cash and short-term investments (che), divided by total debt plus market capitalization (from CRSP).
M&A Stock Share	Δ Noncash Capital Stock over the sum of Δ Noncash Capital Stock plus Cash for Acquisitions, and coded as missing for firm-years where Merger Dummy equals zero.
Earnings Volatility	The five-year standard deviation of past annual changes in net income (ib), divided by total assets (at).
Abnormal Earnings	The change in EPS (epspx), divided by the year-end share price (from CRSP).
Tax Credits	Tax credits (itcb) divided by total assets (at).
Loss Carryforwards	Tax loss carryforwards (tlcf) divided by total assets (at).
Median Industry Market Leverage	The median if the SIC 3-digit market leverage for each year.
Median Industry Book Leverage	The median if the SIC 3-digit book leverage for each year.
Market to Book	Market capitalization as of fiscal year-end (from CRSP), divided by total assets (at) minus total liabilities (lt).

Table 2, Panel A: Summary statistics

This table presents the summary statistics for the variables used in our study. The sample period is from 2001 to 2013. The definitions of the variables are provided in Table 1.

	Non-CDS Firm (n = 41,202)					CDS Firm (n = 6,362)				
	mean	sd	p25	p50	p75	mean	sd	p25	p50	p75
ΔAssets	0.001	0.331	-0.076	0.041	0.150	0.045	0.189	-0.021	0.043	0.113
Net Investment	0.072	0.102	0.015	0.044	0.102	0.076	0.077	0.030	0.058	0.099
Net Capex	0.049	0.062	0.012	0.029	0.061	0.052	0.048	0.021	0.039	0.067
Cash for Aqc.	0.021	0.057	0.000	0.000	0.006	0.023	0.054	0.000	0.000	0.017
Other Investment	0.001	0.046	0.000	0.000	0.000	0.001	0.030	0.000	0.000	0.001
Δ Cash	-0.012	0.177	-0.040	0.001	0.047	0.008	0.062	-0.010	0.003	0.026
Δ Employees	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Net Debt Issuance	0.006	0.099	-0.021	0.000	0.016	0.009	0.078	-0.024	0.000	0.033
Δ Debt	0.006	0.099	-0.021	0.000	0.016	0.012	0.089	-0.023	0.000	0.040
Δ Goodwill	0.008	0.068	0.000	0.000	0.003	0.011	0.062	0.000	0.000	0.010
Δ Noncash Capital										
Stock	0.031	0.092	0.000	0.001	0.014	0.021	0.062	0.000	0.002	0.010
Merger Dummy	0.195	0.396	0.000	0.000	0.000	0.361	0.480	0.000	0.000	1.000
Merger Count	1.640	1.410	1.000	1.000	2.000	2.158	1.916	1.000	2.000	3.000
Value of M&A	0.169	0.200	0.039	0.103	0.227	0.093	0.144	0.011	0.040	0.117
Value of M&A										
(Public-Public)	0.276	0.293	0.088	0.195	0.376	0.157	0.233	0.021	0.086	0.208
M&A consideration	0.053	0.113	0.000	0.006	0.046	0.043	0.087	0.001	0.009	0.042
Ln(Assets)	5.564	1.931	4.193	5.514	6.813	8.815	1.140	7.975	8.755	9.634
Net PPE	0.256	0.243	0.065	0.166	0.382	0.348	0.244	0.135	0.296	0.542
Book Leverage	0.191	0.212	0.002	0.127	0.316	0.310	0.182	0.186	0.286	0.404
EBIT	-0.033	0.306	-0.065	0.053	0.113	0.084	0.105	0.049	0.084	0.129
Working Capital	0.244	0.264	0.000	0.198	0.431	0.111	0.146	0.000	0.081	0.201
Cash	0.241	0.249	0.042	0.146	0.371	0.096	0.117	0.018	0.055	0.132
Asset Turnover	0.999	0.796	0.444	0.820	1.347	0.944	0.666	0.467	0.794	1.196
Retained Earnings	-0.680	2.217	-0.552	0.037	0.281	0.141	0.725	0.041	0.203	0.377
ROA	-0.066	0.298	-0.076	0.025	0.071	0.039	0.093	0.017	0.044	0.078
Volatility	0.577	0.359	0.326	0.497	0.744	0.395	0.214	0.251	0.343	0.478
Excess Returns	0.086	0.616	-0.259	-0.021	0.256	0.102	0.450	-0.149	0.037	0.254
Investment-grade	0.052	0.222	0.000	0.000	0.000	0.643	0.479	0.000	1.000	1.000
Rated	0.150	0.357	0.000	0.000	0.000	0.932	0.251	1.000	1.000	1.000
Q	21.653	64.031	0.920	2.926	12.386	6.217	15.39	1.185	2.198	5.822
Lender FX Usage	0.000	0.002	0.000	0.000	0.000	0.001	0.008	0.000	0.000	0.000
Above 75th										
percentile										
intangibles	0.259	0.438	0.000	0.000	1.000	0.397	0.489	0.000	0.000	1.000
Above median of										
Median industty Q	0.529	0.499	0.000	1.000	1.000	0.287	0.452	0.000	0.000	1.000
Median industry Q	12.877	50.951	1.464	3.234	8.857	3.818	7.743	1.273	1.939	3.514
State Defaults	0.010	0.032	0.000	0.001	0.007	0.008	0.029	0.000	0.001	0.005
Δ Book Leverage	0.006	0.100	-0.026	0.000	0.021	0.001	0.071	-0.031	-0.005	0.024
Δ Net Book Lev.	0.011	0.159	-0.062	-0.001	0.070	-0.001	0.092	-0.044	-0.008	0.033
Δ Market Lev.	0.005	0.116	-0.030	0.000	0.030	-0.001	0.101	-0.047	-0.005	0.037
Δ Net Market Lev.	-0.002	0.224	-0.080	-0.003	0.078	-0.004	0.114	-0.053	-0.008	0.040
M&A Stock Share	0.368	0.357	0.039	0.235	0.678	0.391	0.340	0.069	0.306	0.677
Earnings Volatility	0.130	0.237	0.020	0.049	0.127	0.050	0.099	0.011	0.022	0.048
Abnormal Earnings	-0.013	0.420	-0.038	0.004	0.038	-0.016	0.308	-0.019	0.005	0.022

Tax Credits	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Loss Carryforwards	0.382	1.178	0.000	0.000	0.128	0.060	0.223	0.000	0.000	0.035
Median Industry										
Market Leverage	0.164	0.187	0.017	0.087	0.252	0.267	0.192	0.103	0.242	0.414
Median Industry										
Book Leverage	0.157	0.152	0.034	0.099	0.257	0.233	0.136	0.125	0.244	0.340
Market to Book	2.712	4.274	0.894	1.700	3.155	2.783	3.798	1.303	2.020	3.254

Table 2, Panel B

This table shows the fiscal year of CDS introduction for CDS sample firms.

Year	Introductions	Percent of total
2001	10	1.81
2002	152	27.44
2003	94	16.97
2004	99	17.87
2005	79	14.26
2006	49	8.84
2007	21	3.79
2008	29	5.23
2009	5	0.90
2010	3	0.54
2011	4	0.72
2012	6	1.08
2013	3	0.54
554		

Table 3: CDS introduction, capital expenditures, and financing: differences-in-differences estimations

This table presents the results of regressions of investment and financing variables on a dummy for the years in which a firm has active CDS trading and control variables. All variables are defined in Table 1. All independent variables are from the prior fiscal year. All regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Assets	Net Investment	Net Capex	Cash for Aqc.	Other Inv.	Δ Cash	Δ Employees	Net Debt Issuance
CDSactive	-0.0167** (-2.29)	-0.00431 (-1.58)	0.00421*** (2.96)	-0.0103*** (-5.43)	0.00116 (0.81)	0.011*** (3.51)	-0.0001*** (-2.72)	-0.0122*** (-3.90)
Ln(Assets)	-0.138*** (-23.75)	-0.0088*** (-5.04)	-0.0027*** (-2.77)	-0.0058*** (-5.73)	0.000646 (0.86)	-0.04*** (-14.46)	-0.0005*** (-16.26)	-0.0134*** (-7.46)
PPE	0.214*** (6.62)	0.0330*** (3.53)	-0.00421 (-0.66)	0.0247*** (4.94)	0.0174*** (4.66)	-0.00876 (-0.61)	-0.0005*** (-2.90)	0.0678*** (6.60)
Book Lev.	-0.171*** (-9.09)	-0.0815*** (-14.38)	-0.0324*** (-11.57)	-0.0326*** (-9.25)	-0.0082*** (-2.92)	-0.08*** (-7.60)	-0.0005*** (-5.26)	-0.256*** (-32.13)
EBIT	0.257*** (5.48)	0.0911*** (7.66)	0.0320*** (4.95)	0.0482*** (7.30)	0.00704 (1.18)	0.094*** (3.53)	0.00099*** (3.79)	0.0445*** (2.59)
Work. Cap.	0.0843*** (3.30)	0.0311*** (5.29)	0.00437* (1.69)	0.0153*** (4.45)	0.00904*** (2.82)	0.0306** (2.16)	7.63e-05 (0.62)	0.0325*** (4.00)
Cash	-0.117*** (-4.05)	0.0758*** (10.00)	0.0111*** (3.42)	0.0519*** (11.56)	0.00702 (1.61)	-0.60*** (-36.76)	0.00051*** (3.60)	-0.0546*** (-6.23)
Turnover	0.0480*** (5.80)	0.00564*** (2.86)	0.00265** (2.22)	0.000976 (0.78)	0.00242** (2.33)	0.017*** (4.30)	-0.0006*** (-9.39)	0.00156 (0.64)
Ret. Earn.	-0.0294*** (-8.52)	0.000678 (1.01)	0.001*** (3.18)	0.00090** (2.48)	-0.0010*** (-2.67)	-0.02*** (-8.49)	-1.27e-06 (-0.10)	-0.00186** (-2.25)
ROA	-0.142*** (-2.94)	-0.0728*** (-6.10)	-0.0254*** (-3.95)	-0.0375*** (-5.65)	-0.00821 (-1.32)	-0.09*** (-3.28)	-8.67e-05 (-0.32)	-0.0539*** (-3.09)
Volatility	-0.096*** (-10.83)	-0.022*** (-9.45)	-0.0059*** (-5.16)	-0.0152*** (-11.08)	-0.0002 (-0.19)	-0.008* (-1.70)	-0.0002*** (-2.90)	-0.022*** (-8.21)
Excess Ret's	0.0589*** (25.55)	0.0106*** (13.84)	0.00476*** (13.72)	0.0023*** (4.93)	0.00279*** (6.46)	0.020*** (13.89)	0.00017*** (12.06)	0.00424*** (5.25)
Inv.-grade	0.0136* (1.88)	0.00900*** (3.02)	0.00146 (1.00)	0.00325 (1.59)	0.00278** (2.08)	0.00152 (0.43)	-5.31e-06 (-0.10)	0.00492 (1.47)
Rated	0.0298*** (3.40)	-0.00881** (-2.45)	0.000393 (0.22)	-0.007*** (-2.99)	-0.000741 (-0.48)	0.018*** (4.77)	5.06e-05 (1.00)	0.00736* (1.95)
Q	0.00062*** (9.27)	1.81e-05 (1.22)	0.05*** (-5.96)	-4.66e-06 (-0.50)	0.05*** (4.70)	0.000414*** (9.48)	5.83e-07*** (2.85)	1.46e-05 (0.81)
Constant	0.824*** (17.81)	0.110*** (8.16)	0.0657*** (8.67)	0.0508*** (6.61)	-0.0152*** (-2.58)	0.357*** (15.69)	0.00402*** (15.74)	0.142*** (10.33)
Obs.	47,564	47,564	47,564	47,564	47,564	47,563	46,315	47,564
Adj. R ²	0.193	0.071	0.057	0.044	0.011	0.216	0.060	0.126
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4: CDS introduction and merger activity: differences-in-differences estimations

This table presents the results of regressions of merger activity variables on a dummy for the years in which a firm has active CDS trading and control variables. All variables are defined in Table 1. All independent variables are from the prior fiscal year. All regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

			Linear Prob.	Cond. Logit			
	Δ Goodwill	Δ Noncash Capital Stock	Merger Dummy	Merger Dummy	Merger Count	Value of M&A	Value of M&A (only public- public)
CDSactive	-0.0109*** (-4.69)	-0.00513** (-2.02)	-0.0907*** (-5.56)	-0.571*** (-5.50)	-0.176 (-1.63)	-0.0247** (-2.06)	-0.125*** (-3.01)
Ln(Assets)	-0.0131*** (-11.20)	-0.0148*** (-8.56)	0.0395*** (5.72)	0.289*** (5.60)	0.0992* (1.90)	-0.0820*** (-7.03)	-0.118** (-2.44)
PPE	0.0869*** (15.12)	0.0146 (1.58)	-0.0368 (-1.08)	-0.505* (-1.73)	-0.0688 (-0.27)	0.0462 (0.79)	0.214 (1.02)
Book Lev.	-0.00772** (-1.97)	0.0377*** (4.96)	-0.123*** (-5.90)	-0.925*** (-5.30)	-0.805*** (-4.56)	-0.0445 (-1.33)	0.228 (1.58)
EBIT	0.0105 (0.88)	0.0641*** (3.26)	0.238*** (4.92)	2.019*** (4.85)	1.421** (2.56)	0.274** (2.38)	0.911 (1.20)
WC	0.0452*** (10.00)	-0.0350*** (-3.78)	0.0233 (0.98)	0.371* (1.66)	0.239 (1.09)	0.115** (2.10)	0.000401 (0.00)
Cash	0.0666*** (11.90)	0.0573*** (6.01)	0.126*** (4.27)	0.976*** (3.82)	0.0758 (0.30)	0.179*** (3.02)	0.345 (1.47)
Turnover	0.0110*** (6.83)	0.00434* (1.87)	0.00239 (0.28)	0.0503 (0.73)	-0.0794 (-1.23)	0.0170 (1.01)	0.00706 (0.08)
Ret. Earn.	-0.000852 (-1.48)	0.00249** (2.00)	-0.00246 (-1.08)	0.0567** (2.07)	-0.0284 (-1.32)	0.0381*** (3.51)	0.128*** (3.02)
ROA	-0.00511 (-0.41)	-0.0877*** (-4.27)	-0.201*** (-4.03)	-1.539*** (-3.61)	-1.199** (-2.17)	-0.222* (-1.77)	-0.724 (-0.99)
Volatility	-0.0055*** (-3.03)	0.009*** (3.02)	-0.071*** (-7.13)	-0.620*** (-6.78)	-0.248** (-2.54)	0.0175 (0.82)	0.232* (1.89)
Ex. Ret	0.00517*** (9.46)	0.00354*** (4.33)	0.0198*** (6.61)	0.155*** (6.72)	0.113*** (3.83)	0.0118 (1.57)	0.0303 (1.08)
Inv.-grade	0.00367 (1.55)	0.00511** (1.99)	0.0189 (1.00)	0.0708 (0.61)	-0.0837 (-0.55)	0.0181 (1.19)	0.101* (1.67)
Rated	-0.00455* (-1.75)	-0.00351 (-1.43)	-0.0372** (-2.40)	-0.196** (-2.02)	0.0689 (0.54)	-0.00954 (-0.48)	-0.0606 (-0.81)
Q	4.18e-05*** (4.03)	0.00012*** (5.04)	-1.11e-05 (-0.23)	2.50e-05 (0.05)	6.40e-05 (0.11)	8.54e-05 (0.66)	-0.000190 (-0.32)
Constant	0.0364*** (4.09)	0.0913*** (6.88)	-0.000147 (-0.00)		1.255*** (2.97)	0.636*** (6.66)	0.898* (1.89)
Obs.	47,564	42,623	47,593	31,217	9,240	6,369	1,054
Adj. R ²	0.070	0.032	0.018		0.019	0.118	0.312
Pseudo R ²				0.033			
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5: Propensity score matching samples

This table summarizes the propensity score matched samples for firms initiating CDS trading. Panel A shows the results of propensity score estimation, using the pre-matching and matched samples. All variables are defined in Table 1. All independent variables are from the fiscal year prior to the treatment firm-year. NN1 uses one-nearest-neighbor matching based on the propensity score, using matching with replacement. All regressions include year and industry (using Fama-French 12-industry categories) fixed effects, and *t*-statistics are calculated using standard errors clustered at the firm level. Panel B shows propensity score summary statistics for both treatment and matching/control firm-years, for the year in which the match was made. Panel C presents tests of mean differences in lagged predictor variables between treatment and matching/control firm-years, for the year in which the match was made. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Pre- and post-matching propensity score parameters		
	Pre-matching	Post –matching
		NN1
Ln(Assets)	0.259*** (12.29)	0.0937*** (3.71)
Capex	-0.0735 (-0.12)	0.784 (1.21)
PPE	-0.156 (-1.01)	-0.373** (-2.25)
Book Leverage	0.871*** (5.36)	0.525*** (2.96)
EBIT	-0.563 (-0.68)	0.286 (0.31)
Working Capital	0.0988 (0.44)	0.0910 (0.37)
Cash	-0.402 (-1.45)	-0.554* (-1.77)
Asset Turnover	0.0300 (0.65)	-0.0784 (-1.52)
Retained Earnings	-0.0442 (-1.18)	-0.0282 (-0.69)
ROA	0.456 (0.50)	-0.577 (-0.57)
Volatility	-0.296* (-1.79)	-0.132 (-0.73)
Excess Returns	0.00309 (0.06)	0.0206 (0.35)
Investment-grade	0.331*** (4.98)	0.0929 (1.30)
Rated	0.956*** (10.22)	0.385*** (3.09)
Constant	-6.187*** (-17.47)	-3.328*** (-9.18)
Observations	39,629	5,533
Pseudo R ²	0.391	0.105
Year F.E.	Yes	Yes
Firm F.E.	Yes	Yes

Panel B: Propensity score summary statistics: treatments and controls

	mean	sd	min	p5	p25	p50	p75	p95	max
Treatment	0.13635	0.08624	0.00022	0.01291	0.07325	0.12327	0.18784	0.29786	0.46090
Controls	0.13635	0.08635	0.00022	0.01292	0.07352	0.12300	0.18738	0.29772	0.48200
Absolute Difference	0.00033	0.00102	0.00000	0.00001	0.00005	0.00014	0.00034	0.00107	0.02110

	NN1			
	Treatments	Controls	Difference	T-stat
Ln(Assets)	8.759	8.681	0.078	1.23
Capex	0.054	0.056	-0.002	-0.73
PPE	0.350	0.367	-0.018	-1.43
Book Leverage	0.328	0.331	-0.003	-0.28
EBIT	0.074	0.077	-0.002	-0.43
Working Capital	0.094	0.091	0.003	0.44
Cash	0.086	0.085	0.001	0.21
Asset Turnover	0.925	0.909	0.016	0.42
Retained Earnings	0.115	0.133	-0.018	-0.57
ROA	0.029	0.034	-0.005	-0.98
Volatility	0.385	0.376	0.009	0.90
Excess Returns	0.136	0.141	-0.005	-0.17
Investment-grade	0.679	0.719	-0.040	-1.59
Rated	0.967	0.976	-0.009	-0.89

Table 6: CDS introduction, capital expenditures, and financing: differences-in-differences estimations with propensity score matching

This table presents the results of regressions of investment and financing variables on a dummy for the years in which a firm has active CDS trading and control variables, using propensity score matched samples for firms initiating CDS trading. All variables are defined in Table 1. All independent variables are from the prior fiscal year. Propensity scores are based on one-nearest-neighbor matching, using matching with replacement. All regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Assets	Net Investment	Net Capex	Cash for Aqc.	Other Inv.	Δ Cash	Δ Employees	Net Debt Issuance
CDSactive	-0.0225*** (-3.21)	-0.00410 (-1.43)	0.000280 (0.20)	-0.0058*** (-2.84)	0.000497 (0.33)	-0.00035 (-0.14)	-0.0001*** (-3.05)	-0.00800** (-2.40)
Ln(Assets)	-0.120*** (-10.78)	-0.0142*** (-3.70)	-0.000360 (-0.17)	-0.0140*** (-5.32)	0.000789 (0.54)	-0.02*** (-6.24)	-0.0004*** (-7.72)	-0.0280*** (-7.24)
PPE	0.206*** (3.61)	0.0759*** (4.80)	0.0402*** (4.08)	0.0175 (1.54)	0.0145** (2.16)	0.00961 (0.68)	-0.00041** (-2.15)	0.0793*** (4.67)
Book Lev.	-0.111*** (-3.87)	-0.0619*** (-5.08)	-0.0276*** (-5.35)	-0.0307*** (-3.23)	-0.000436 (-0.07)	-0.04*** (-4.13)	-0.0006*** (-3.53)	-0.245*** (-14.96)
EBIT	0.317*** (3.20)	0.116*** (3.35)	0.0536*** (3.56)	0.0672*** (3.00)	-0.00755 (-0.37)	0.0143 (0.34)	0.000530 (1.42)	0.166*** (3.74)
Work. Cap.	0.121*** (2.68)	0.0693*** (4.37)	0.0133** (2.44)	0.0453*** (4.31)	0.00445 (0.45)	0.079*** (4.85)	0.000146 (0.78)	0.0344* (1.84)
Cash	-0.166*** (-2.76)	0.0900*** (3.67)	0.00521 (0.80)	0.0791*** (5.47)	0.00290 (0.16)	-0.53*** (-16.06)	9.28e-05 (0.37)	-0.0965*** (-4.29)
Turnover	0.0496*** (3.87)	0.0146*** (3.33)	0.00295 (1.40)	0.00896*** (3.23)	0.00259 (0.97)	0.0095** (2.41)	-0.0003*** (-3.56)	0.00286 (0.50)
Ret. Earn.	-0.0179 (-1.05)	0.0125*** (4.03)	0.000642 (0.60)	0.00770*** (4.19)	0.00364** (2.00)	-0.0059* (-1.87)	7.06e-05 (1.55)	0.00297 (0.80)
ROA	-0.0873 (-0.71)	-0.0605 (-1.43)	-0.0362** (-2.10)	-0.0420* (-1.73)	0.0185 (0.72)	-0.0274 (-0.61)	0.000192 (0.44)	-0.126** (-2.41)
Volatility	-0.074*** (-3.74)	-0.027*** (-4.00)	-0.008*** (-2.88)	-0.019*** (-4.16)	0.0023 (0.72)	0.025*** (3.40)	-0.0003** (-4.39)	-0.011 (-1.17)
Excess Ret's	0.0454*** (8.54)	0.00959*** (4.48)	0.00320*** (4.47)	0.00480*** (3.08)	0.000769 (0.85)	0.005*** (2.95)	0.00014*** (5.95)	0.00632*** (2.59)
Inv.-grade	0.0217** (2.41)	0.0117*** (3.39)	0.00237 (1.53)	0.00410* (1.74)	0.00420*** (2.89)	0.000368 (0.12)	3.94e-05 (0.82)	0.00959** (2.38)
Rated	-0.00753 (-0.43)	-0.0219*** (-3.10)	-0.00569* (-1.74)	-0.00920** (-2.00)	-0.00583* (-1.70)	0.00914 (1.48)	-0.0002** (-2.22)	0.00876 (1.04)
Q	0.00083*** (3.22)	-5.81e-05 (-0.69)	3.10e-05 (0.80)	-0.0002*** (-4.41)	0.000110* (1.74)	0.001*** (3.48)	-7.39e-07 (-1.48)	7.24e-05 (0.63)
Constant	1.052*** (8.85)	0.174*** (4.49)	0.0484** (2.22)	0.136*** (5.12)	-0.0137 (-0.98)	0.223*** (6.76)	0.00424*** (8.42)	0.302*** (7.48)
Obs.	10,330	10,330	10,330	10,330	10,330	10,329	10,059	10,330
Adj. R ²	0.185	0.106	0.080	0.073	0.012	0.223	0.068	0.147
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: CDS introduction and merger activity: differences-in-differences estimations with propensity score matching

This table presents the results of regressions of merger activity variables on a dummy for the years in which a firm has active CDS trading and control variables, using propensity score matched samples for firms initiating CDS trading. All variables are defined in Table 1. All independent variables are from the prior fiscal year. Propensity scores are based on one-nearest-neighbor matching, using matching with replacement. All regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

			Linear Prob.	Cond. Logit			
	Δ Goodwill	Δ Noncash Capital Stock	Merger Dummy	Merger Dummy	Merger Count	Value of M&A	Value of M&A (only public- public)
CDSactive	-0.00950*** (-3.71)	-0.0085*** (-3.36)	-0.0593*** (-3.25)	-0.399*** (-3.31)	-0.228* (-1.85)	-0.0117 (-0.87)	-0.0850** (-2.20)
Ln(Assets)	-0.0149*** (-5.41)	-0.0127*** (-4.17)	0.0205 (1.05)	0.196 (1.59)	0.120 (1.03)	-0.110*** (-4.51)	-0.182*** (-3.39)
PPE	0.0659*** (5.44)	0.0296** (2.46)	-0.0978 (-1.01)	-1.067 (-1.51)	-0.626 (-1.02)	0.0706 (0.85)	0.236 (0.62)
Book Lev.	-0.0111 (-1.21)	-0.000961 (-0.06)	-0.127** (-1.98)	-0.760* (-1.76)	-0.917** (-2.07)	-0.00349 (-0.06)	0.220 (1.53)
EBIT	0.0406 (1.51)	0.0758*** (2.61)	0.351* (1.81)	1.651 (1.19)	1.735 (1.06)	0.130 (0.75)	0.710 (0.92)
WC	0.0570*** (4.02)	-0.00295 (-0.21)	0.0433 (0.47)	0.150 (0.24)	-0.0130 (-0.02)	0.103 (1.38)	0.205 (0.72)
Cash	0.0608*** (3.58)	0.0683*** (2.96)	0.00476 (0.04)	0.0329 (0.04)	0.0301 (0.03)	0.0775 (0.78)	0.182 (0.59)
Turnover	0.00918** (2.31)	0.0175*** (2.83)	0.0212 (0.78)	0.262 (1.45)	-0.149 (-0.97)	0.0181 (0.61)	-0.00477 (-0.04)
Ret. Earn.	0.00467* (1.71)	0.0168** (1.96)	0.0390** (2.14)	0.299 (1.37)	-0.0945 (-1.50)	0.102*** (10.32)	0.203*** (13.59)
ROA	-0.0255 (-0.91)	-0.0869* (-1.93)	-0.338 (-1.60)	-1.417 (-0.88)	-1.230 (-0.74)	0.0366 (0.20)	-0.439 (-0.68)
Volatility	0.0016 (0.30)	0.0011* (1.80)	-0.101*** (-2.85)	-0.725*** (-2.92)	-0.613* (-1.69)	0.064 (1.55)	-0.085 (-0.74)
Ex. Ret	0.0114*** (6.30)	0.00580*** (2.71)	0.0497*** (5.02)	0.336*** (5.19)	0.100 (1.22)	0.0143 (1.17)	0.00301 (0.09)
Inv.-grade	0.00639** (2.22)	0.00146 (0.50)	0.00930 (0.43)	-0.00920 (-0.07)	-0.0997 (-0.57)	0.0338 (1.30)	0.117* (1.84)
Rated	-0.00523 (-0.98)	-0.00316 (-0.53)	-0.0470 (-1.37)	-0.261 (-1.24)	-0.187 (-0.52)	-0.0453 (-0.97)	-0.115 (-1.18)
Q	-6.50e-05 (-1.04)	0.000240 (1.35)	-0.000685* (-1.70)	-0.00442* (-1.70)	-0.00198 (-0.45)	0.000101 (0.38)	-6.53e-05 (-0.25)
Constant	0.103*** (3.71)	0.0938*** (3.19)	0.210 (1.06)		2.066 (1.61)	1.018*** (4.03)	1.702*** (2.89)
Obs.	10,330	9,301	10,333	8,008	2,880	1,947	536
Adj. R ²	0.073	0.048	0.035		0.010	0.221	0.515
Pseudo R ²				0.052			
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: Instrumental Variable Regressions

This table presents the results of instrumental variable regressions of investment, financing, and merger activity variables on the predicted probability of CDS trading from a first-stage model (Appendix). The instrument used is banks' foreign exchange hedging. All variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Assets	Net Investment	Net Capex	Cash for Acq.	Δ Employees	Net debt issuance	Δ Goodwill	Δ Noncash Capital Stock	Merger Dummy	Merger Count	Value of M&A
CDSactive	-0.0284* (-1.76)	-0.02*** (-3.66)	0.01*** (2.74)	-0.03*** (-8.08)	-0.0003*** (-3.60)	-0.041*** (-7.17)	-0.023*** (-4.92)	0.000614 (0.11)	-0.168*** (-4.76)	-0.266 (-0.90)	-0.120*** (-4.03)
Ln(Assets)	-0.166*** (-22.08)	-0.01*** (-5.18)	-0.002** (-2.07)	-0.01*** (-6.21)	-0.0006*** (-15.92)	-0.017*** (-7.74)	-0.015*** (-10.15)	-0.02*** (-9.47)	0.0398*** (4.84)	0.0610 (1.05)	-0.0877*** (-5.58)
PPE	0.229*** (5.87)	0.0192* (1.70)	-0.03*** (-3.62)	0.032*** (5.24)	-0.0007*** (-3.36)	0.0743*** (5.86)	0.0976*** (13.95)	0.0148 (1.23)	-0.0174 (-0.43)	-0.129 (-0.39)	0.0803 (1.13)
Leverage	-0.164*** (-7.24)	-0.09*** (-12.85)	-0.03*** (-10.01)	-0.03*** (-8.20)	-0.0005*** (-4.52)	-0.294*** (-31.72)	-0.00553 (-1.17)	0.046*** (4.97)	-0.117*** (-5.01)	-0.955*** (-4.87)	-0.0826** (-2.17)
EBIT	0.240*** (4.42)	0.08*** (6.18)	0.029*** (4.10)	0.044*** (5.96)	0.00086*** (2.75)	0.0414** (1.98)	0.00334 (0.25)	0.063*** (2.64)	0.199*** (3.75)	1.730** (2.57)	0.204 (1.43)
Working Cap.	0.103*** (3.43)	0.04*** (5.40)	0.005* (1.74)	0.02*** (5.09)	0.000101 (0.69)	0.0273*** (2.96)	0.0520*** (9.73)	-0.04*** (-3.29)	0.0464* (1.76)	0.122 (0.48)	0.133** (2.07)
Cash	-0.105*** (-3.17)	0.08*** (9.51)	0.012*** (3.24)	0.056*** (10.83)	0.0006*** (3.87)	-0.058*** (-5.88)	0.0732*** (11.05)	0.058*** (5.07)	0.148*** (4.54)	0.339 (1.18)	0.174*** (2.63)
Turnover	0.0562*** (5.70)	0.008*** (3.34)	0.003*** (2.58)	0.00205 (1.43)	-0.0006*** (-8.53)	0.00236 (0.80)	0.0120*** (6.19)	0.00330 (1.13)	0.00255 (0.26)	-0.0367 (-0.47)	0.0242 (1.18)
Ret. Earn.	-0.033*** (-8.39)	0.00101 (1.25)	0.001*** (3.45)	0.001*** (2.88)	-2.02e-06 (-0.12)	-0.00154 (-1.62)	-0.000995 (-1.40)	0.005*** (3.18)	-0.00126 (-0.49)	-0.0195 (-0.82)	0.0448*** (3.67)
ROA	-0.119** (-2.12)	-0.07*** (-5.06)	-0.03*** (-3.44)	-0.04*** (-4.69)	6.86e-05 (0.21)	-0.0514** (-2.40)	0.000924 (0.07)	-0.09*** (-3.44)	-0.177*** (-3.23)	-1.509** (-2.25)	-0.143 (-0.92)
Volatility	-0.091*** (-9.58)	-0.02*** (-8.72)	-0.01*** (-4.89)	-0.02*** (-10.28)	-0.0002*** (-2.83)	-0.022*** (-7.79)	-0.004** (-2.03)	0.007** (2.00)	-0.070*** (-6.54)	-0.29** (-2.39)	0.027 (1.06)
Excess Ret.	0.0527***	0.01***	0.005***	0.002***	0.00016***	0.0033***	0.0046***	0.003***	0.0180***	0.0962***	0.0121

	(21.59)	(11.56)	(12.19)	(3.52)	(9.73)	(3.67)	(7.44)	(3.62)	(5.44)	(2.91)	(1.43)
Inv. Grade	0.0209**	0.01***	4.74e-05	0.007***	5.40e-05	0.0116***	0.0082***	0.00566*	0.0196	-0.140	0.0427**
	(2.18)	(3.08)	(0.03)	(3.09)	(0.86)	(2.93)	(2.73)	(1.89)	(0.95)	(-0.75)	(2.25)
Rated	0.0316***	-0.00636	-0.00116	-0.00299	9.89e-05	0.0134***	-0.00162	-0.00138	-0.0150	0.101	0.00399
	(2.85)	(-1.43)	(-0.56)	(-1.01)	(1.48)	(2.83)	(-0.47)	(-0.45)	(-0.81)	(0.64)	(0.15)
Q	0.0007***	2.57e-05	-3.20e-05***	-6.92e-08	6.00e-07**	8.26e-06	5.14e-05***	0.000***	-3.82e-05	0.000229	0.000132
	(9.38)	(1.44)	(-5.25)	(-0.01)	(2.36)	(0.38)	(4.00)	(3.92)	(-0.67)	(0.29)	(0.92)
Constant	0.968***	0.120***	0.064***	0.063***	0.00472***	0.162***	0.0375***	0.132***	0.0334	1.538***	0.654***
	(16.80)	(7.78)	(7.28)	(6.79)	(15.31)	(9.67)	(3.40)	(7.59)	(0.56)	(3.34)	(5.36)
Observations	38,105	38,105	38,105	38,105	36,984	38,105	38,105	33,947	38,133	7,303	5,124
Overall R ²	0.218	0.079	0.066	0.053	0.066	0.152	0.076	0.034	0.021	0.023	0.133
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: CDS introduction and net debt issuance: cross-sectional tests

This table presents the results of regressions of net debt issuance on a dummy for the years in which a firm has active CDS trading, control variables, and interactive partition dummy variables. All variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Above 75 th percentile, intangibles	Above 75 th percentile, intangibles, restrict to lagged book leverage>0	Above median of industry- year Q	Above median of industry- year Q, restricted to lagged book leverage >0	State Defaults	State Defaults, restrict to book leverage>0
CDSactive	-0.013*** (-3.51)	-0.011*** (-2.87)	-0.009*** (-2.71)	-0.0065** (-1.97)	-0.0140*** (-4.18)	-0.012*** (-3.50)
conditioning variable	0.000723 (0.33)	0.00376 (1.46)	0.0067*** (4.02)	0.0067*** (3.29)	-0.0151 (-0.93)	-0.0209 (-1.09)
CDSactive x conditioning variable	0.00207 (0.49)	0.00128 (0.30)	-0.011*** (-2.80)	-0.011*** (-2.82)	0.0511 (1.46)	0.0661* (1.84)
Ln(Assets)	-0.014*** (-7.37)	-0.019*** (-8.23)	-0.014*** (-7.50)	-0.018*** (-8.28)	-0.018*** (-7.33)	-0.025*** (-8.18)
PPE	0.0707*** (6.38)	0.0847*** (6.73)	0.0678*** (6.60)	0.0795*** (6.80)	0.0795*** (5.80)	0.0888*** (5.67)
Leverage	-0.262*** (-32.64)	-0.262*** (-30.50)	-0.255*** (-32.09)	-0.256*** (-30.18)	-0.291*** (-29.01)	-0.332*** (-32.02)
EBIT	0.0459** (2.57)	0.0618*** (2.91)	0.0438** (2.54)	0.0610*** (2.95)	0.0412* (1.86)	0.0683*** (2.75)
Working Cap.	0.0323*** (3.83)	0.0376*** (3.69)	0.0324*** (4.00)	0.0364*** (3.70)	0.0240** (2.40)	0.0114 (0.99)
Cash	-0.054*** (-6.01)	-0.063*** (-5.55)	-0.055*** (-6.23)	-0.067*** (-5.97)	-0.0556*** (-5.11)	-0.049*** (-3.57)
Turnover	0.00157 (0.62)	0.00177 (0.59)	0.00153 (0.63)	0.00164 (0.57)	0.00409 (1.33)	0.00454 (1.27)
Ret. Earn.	-0.0018** (-2.16)	-0.00114 (-1.02)	-0.0019** (-2.24)	-0.00118 (-1.06)	-0.00135 (-1.37)	-0.0030** (-2.10)
ROA	-0.056*** (-3.11)	-0.072*** (-3.33)	-0.053*** (-3.05)	-0.071*** (-3.32)	-0.0508** (-2.25)	-0.079*** (-3.07)
Volatility	-0.023*** (-8.18)	-0.026*** (-7.75)	-0.023*** (-8.36)	-0.026*** (-7.92)	-0.024*** (-7.94)	-0.026*** (-6.99)
Excess Ret.	0.005*** (5.39)	0.0047*** (4.77)	0.0042*** (5.24)	0.00436*** (4.51)	0.00320*** (3.38)	0.00402*** (3.44)
Inv. Grade	0.00485 (1.39)	0.00405 (1.13)	0.00530 (1.59)	0.00440 (1.28)	0.00464 (1.13)	0.00342 (0.81)
Rated	0.00660* (1.72)	0.00926** (2.28)	0.00728* (1.93)	0.0101** (2.51)	0.0130** (2.54)	0.0126** (2.26)
Q	1.11e-05 (0.58)	5.25e-05 (1.31)	1.35e-05 (0.75)	5.28e-05 (1.42)	7.22e-06 (0.30)	4.07e-05 (0.86)
Constant	0.144*** (10.17)	0.181*** (10.01)	0.139*** (10.16)	0.176*** (10.12)	0.160*** (8.93)	0.223*** (9.74)

Observations	45,696	37,285	47,564	38,794	32,625	26,830
Adj. R ²	0.129	0.130	0.126	0.127	0.149	0.182
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: CDS introduction and merger-related leverage changes

This table presents the results of regressions of yearly leverage changes on a dummy for the years in which a firm has active CDS trading, control variables, and interactive merger dummy variables. It also includes results of a regression of the share of M&A consideration composed of stock issuance on a dummy for the years in which a firm has active CDS trading and control variables, for years in which M&A activity occurred. All other variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Book Leverage	Δ Market Leverage	Δ Net Book Leverage	Δ Net Market Leverage	M&A Stock Share
CDSactive	0.000319 (0.09)	-0.00404 (-1.04)	0.000465 (0.11)	-0.00102 (-0.22)	0.0351* (1.83)
Merger dummy	0.00340** (2.49)	0.00962*** (5.83)	0.0184*** (8.85)	0.0196*** (6.48)	
CDSactive x merger dummy	-0.00871*** (-3.13)	-0.00596* (-1.67)	-0.0211*** (-5.73)	-0.0102** (-2.12)	
Total M&A consideration	0.123*** (12.60)	0.125*** (13.91)	0.323*** (22.23)	0.251*** (15.85)	
Ln(Assets)	0.0133*** (7.27)	0.0176*** (8.89)	0.0313*** (11.13)	0.00744** (2.08)	-0.0483*** (-4.16)
PPE	0.0270*** (2.68)	0.0295*** (2.62)	0.0593*** (3.75)	-0.00216 (-0.11)	-0.00454 (-0.06)
Leverage	-0.337*** (-34.93)	-0.267*** (-32.04)	-0.313*** (-24.93)	-0.305*** (-22.93)	0.158*** (3.89)
EBIT	-0.0333* (-1.76)	0.0301* (1.70)	-0.124*** (-4.30)	-0.0345 (-0.91)	-0.223* (-1.78)
Working Cap.	0.0433*** (4.67)	0.0499*** (5.90)	0.0281** (2.06)	-0.0375** (-2.28)	-0.182*** (-3.44)
Cash	-0.0613*** (-6.19)	-0.0622*** (-6.68)	0.442*** (28.77)	0.370*** (18.16)	-0.102* (-1.65)
Turnover	-0.00241 (-1.01)	-0.00115 (-0.43)	-0.00983*** (-2.60)	-0.0243*** (-4.99)	0.0104 (0.63)
Ret. Earn.	-0.00282** (-2.42)	-0.00550*** (-6.05)	-0.00329* (-1.89)	-0.0104*** (-5.06)	0.0109 (1.45)
ROA	0.0149 (0.76)	-0.0376** (-2.08)	0.135*** (4.53)	0.0142 (0.36)	0.104 (0.79)
Volatility	-0.005* (-1.75)	-0.069*** (-18.71)	-0.017*** (-3.50)	-0.057*** (-8.10)	0.145*** (6.41)
Excess Ret.	-0.00523*** (-6.16)	0.00751*** (7.80)	-0.00963*** (-7.39)	-0.00340* (-1.81)	0.0129** (2.02)
Inv. Grade	-0.00248 (-0.78)	0.0111** (2.50)	-0.00622 (-1.45)	0.00689 (0.99)	-0.0288 (-1.12)
Rated	0.0111***	0.00722	0.0116**	0.0114	0.0594***

	(2.64)	(1.59)	(2.12)	(1.63)	(2.70)
Q	-1.75e-05	-6.93e-06	-6.12e-05*	-0.00068***	0.000439***
	(-0.89)	(-0.43)	(-1.92)	(-14.19)	(3.26)
Constant	-0.0161	-0.0690***	-0.232***	7.72e-05	0.676***
	(-1.12)	(-4.60)	(-10.44)	(0.00)	(6.90)
Observations	42,556	42,545	42,555	42,544	12,497
Adj. R ²	0.187	0.217	0.275	0.0987	0.0349
Year F.E.	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes

Table 11, Panel A: CDS Introduction, including partial-year dummy

This table presents the results of regressions of investment and financing variables on a dummy for the years in which a firm has active CDS trading, a dummy for the (partial year) year of CDS introduction, and control variables. All other variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Assets	Net Investment	Net Capex	Cash for Aqc.	Δ NonCash Capital Stock	Merger Dummy	Value of Transactions	Net Debt Issuance	Δ Debt
CDSactive	-0.00991 (-1.02)	-0.000960 (-0.29)	0.00394** (2.25)	-0.00676*** (-2.85)	-0.00421 (-1.22)	-0.0884*** (-4.38)	-0.00746 (-0.46)	-0.0108*** (-2.72)	-0.0116** (-2.55)
CDS_partial_	0.0167 (1.38)	0.00820* (1.85)	-0.000645 (-0.37)	0.00860** (2.31)	0.00221 (0.49)	0.00568 (0.23)	0.0354* (1.75)	0.00353 (0.74)	0.0100* (1.79)
Ln(Assets)	-0.138*** (-23.77)	-0.00888*** (-5.08)	-0.00269*** (-2.77)	-0.00591*** (-5.79)	-0.0148*** (-8.56)	0.0395*** (5.71)	-0.0829*** (-7.12)	-0.0134*** (-7.47)	-0.019*** (-8.80)
PPE	0.214*** (6.62)	0.0331*** (3.54)	-0.00422 (-0.66)	0.0247*** (4.96)	0.0146 (1.59)	-0.0367 (-1.08)	0.0466 (0.80)	0.0678*** (6.60)	0.0544*** (4.99)
Leverage	-0.171*** (-9.10)	-0.0816*** (-14.39)	-0.0323*** (-11.57)	-0.0326*** (-9.27)	0.0377*** (4.96)	-0.123*** (-5.90)	-0.0445 (-1.33)	-0.256*** (-32.12)	-0.350*** (-40.36)
EBIT	0.257*** (5.48)	0.0911*** (7.66)	0.0320*** (4.95)	0.0482*** (7.30)	0.0641*** (3.26)	0.238*** (4.92)	0.274** (2.37)	0.0445*** (2.59)	0.0393** (2.13)
Working Cap.	0.0843*** (3.30)	0.0311*** (5.29)	0.00437* (1.69)	0.0153*** (4.44)	-0.0350*** (-3.78)	0.0233 (0.98)	0.115** (2.10)	0.0324*** (4.00)	0.0689*** (7.45)
Cash	-0.117*** (-4.05)	0.0758*** (10.01)	0.0111*** (3.42)	0.0519*** (11.56)	0.0573*** (6.01)	0.126*** (4.27)	0.178*** (3.01)	-0.0546*** (-6.23)	-0.080*** (-8.19)
Turnover	0.0480*** (5.79)	0.00562*** (2.84)	0.00265** (2.22)	0.000956 (0.77)	0.00434* (1.87)	0.00238 (0.28)	0.0161 (0.95)	0.00155 (0.64)	-0.00232 (-0.83)
Ret. Earn.	-0.0294*** (-8.51)	0.000690 (1.03)	0.000994*** (3.18)	0.000917** (2.52)	0.00250** (2.00)	-0.00245 (-1.08)	0.0384*** (3.51)	-0.00186** (-2.25)	-0.003*** (-2.89)
ROA	-0.142*** (-2.94)	-0.0728*** (-6.10)	-0.0254*** (-3.95)	-0.0375*** (-5.66)	-0.0877*** (-4.27)	-0.201*** (-4.04)	-0.223* (-1.77)	-0.0540*** (-3.09)	-0.0421** (-2.26)
Volatility	-0.096*** (-10.84)	-0.023*** (-9.47)	-0.006*** (-5.16)	-0.015*** (-11.13)	0.009*** (3.01)	-0.007*** (-7.13)	0.0176 (0.82)	-0.023*** (-8.22)	-0.028*** (-9.28)
Excess Ret.	0.0590*** (25.56)	0.0106*** (13.84)	0.00476*** (13.72)	0.00229*** (4.94)	0.00354*** (4.33)	0.0198*** (6.61)	0.0118 (1.57)	0.00424*** (5.26)	0.0051*** (5.70)
Inv. Grade	0.0133* (1.84)	0.00884*** (2.98)	0.00148 (1.00)	0.00308 (1.51)	0.00506* (1.96)	0.0188 (0.99)	0.0154 (1.00)	0.00486 (1.45)	0.00208 (0.58)

Rated	0.0296*** (3.38)	-0.00888** (-2.47)	0.000399 (0.22)	-0.00705*** (-3.02)	-0.00353 (-1.44)	-0.0372** (-2.40)	-0.0104 (-0.52)	0.00733* (1.94)	0.0120*** (2.80)
Q	0.000621*** (9.27)	1.82e-05 (1.23)	-3.09e-05*** (-5.96)	-4.52e-06 (-0.48)	0.000123*** (5.04)	-1.10e-05 (-0.23)	8.86e-05 (0.68)	1.46e-05 (0.81)	1.64e-05 (0.88)
Constant	0.824*** (17.82)	0.110*** (8.16)	0.0657*** (8.67)	0.0509*** (6.61)	0.0913*** (6.88)	-7.50e-05 (-0.00)	0.640*** (6.71)	0.142*** (10.33)	0.199*** (12.32)
Observations	47,564	47,564	47,564	47,564	42,623	47,593	6,369	47,564	47,481
Adj. R ²	0.193	0.0713	0.0565	0.0444	0.0320	0.0183	0.119	0.126	0.174
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 11, Panel B: CDS Introduction, including partial-year dummy, with M&A transaction lags

This table presents the results of regressions of investment and financing variables on a dummy for the years in which a firm has active CDS trading, a dummy for the (partial year) year of CDS introduction, control variables, and three lags of M&A transaction consideration. All other variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Δ Assets	Net Investment	Net Capex	Cash for Aqc.	Δ NonCash Capital Stock	Merger Dummy	Value of Transactions	Net Debt Issuance	Δ Debt
CDSactive	-0.00953 (-0.93)	-0.000515 (-0.14)	0.00386** (2.02)	-0.00779*** (-2.95)	-0.00586 (-1.59)	-0.093*** (-4.19)	-0.00911 (-0.49)	-0.0078* (-1.91)	-0.0095** (-2.01)
CDS_partial_year	0.0135 (1.08)	0.00528 (1.15)	-0.000431 (-0.25)	0.00553 (1.44)	0.00209 (0.45)	0.00473 (0.18)	0.0361* (1.69)	0.00497 (1.02)	0.0113** (2.06)
Ln(Assets)	-0.133*** (-19.22)	-0.00769*** (-3.56)	-0.00120 (-1.01)	-0.00576*** (-4.30)	-0.0109*** (-5.79)	0.0297*** (3.31)	-0.08*** (-6.03)	-0.01*** (-6.30)	-0.021*** (-7.92)
PPE	0.233*** (5.86)	0.0455*** (4.29)	0.000713 (0.10)	0.0278*** (4.44)	-0.00301 (-0.30)	-0.0318 (-0.74)	0.118* (1.82)	0.093*** (7.67)	0.0838*** (6.44)
Leverage	-0.178*** (-8.55)	-0.0842*** (-12.55)	-0.0327*** (-9.95)	-0.0358*** (-8.37)	0.0239*** (2.90)	-0.126*** (-4.89)	-0.0317 (-0.70)	-0.29*** (-31.28)	-0.367*** (-35.20)
EBIT	0.286*** (5.72)	0.0856*** (6.01)	0.0283*** (3.57)	0.0504*** (6.35)	0.0814*** (3.65)	0.211*** (3.39)	0.267* (1.71)	0.0496** (2.55)	0.0396* (1.87)
Working Cap.	0.0961*** (3.30)	0.0280*** (3.90)	0.00319 (1.05)	0.0155*** (3.55)	-0.0298*** (-2.75)	0.0541* (1.78)	0.0287 (0.44)	0.027*** (2.75)	0.0576*** (5.29)
Cash	-0.144*** (-4.26)	0.0854*** (8.96)	0.0163*** (4.12)	0.0570*** (10.01)	0.0383*** (3.62)	0.171*** (4.56)	0.257*** (3.54)	-0.05*** (-4.60)	-0.067*** (-5.65)
Turnover	0.0513*** (5.43)	0.00862*** (3.79)	0.00535*** (3.38)	0.000725 (0.47)	0.000829 (0.34)	7.41e-05 (0.01)	0.0225 (1.12)	0.00347 (1.20)	0.000709 (0.22)
Ret. Earn.	-0.0279*** (-5.97)	0.000428 (0.49)	0.000609 (1.27)	0.000612 (1.21)	-0.000699 (-0.40)	-0.00321 (-1.02)	0.0452** (2.28)	-0.00130 (-1.09)	-0.00165 (-1.23)
ROA	-0.193*** (-3.61)	-0.0639*** (-4.46)	-0.0212*** (-2.69)	-0.0385*** (-4.83)	-0.0955*** (-4.01)	-0.139** (-2.12)	-0.244 (-1.29)	-0.05*** (-2.68)	-0.0373* (-1.72)
Volatility	-0.082*** (-8.09)	-0.024*** (-8.45)	-0.0075*** (-5.30)	-0.016*** (-9.32)	0.006* (1.96)	-0.084*** (-6.78)	0.0069 (0.30)	-0.03*** (-7.56)	-0.03*** (-7.82)
Excess Ret.	0.0504*** (20.36)	0.00947*** (11.13)	0.00460*** (11.93)	0.00176*** (3.25)	0.00298*** (3.26)	0.0218*** (5.86)	0.0119 (1.27)	0.003*** (3.68)	0.0037*** (3.57)
Inv. Grade	0.00293 (0.35)	0.00686** (2.07)	0.00189 (1.11)	0.00164 (0.71)	0.00342 (1.20)	0.0174 (0.79)	0.0150 (0.81)	0.00576 (1.50)	0.00256 (0.63)

Rated	0.0243** (2.48)	-0.0105** (-2.47)	-0.00102 (-0.48)	-0.00674** (-2.44)	-0.00262 (-1.02)	-0.0369* (-1.94)	-0.00912 (-0.42)	0.00595 (1.31)	0.00964* (1.89)
Q	0.000674*** (7.27)	3.38e-05 (1.57)	-3.34e-05*** (-4.69)	5.40e-07 (0.04)	0.00013*** (4.56)	3.38e-05 (0.47)	0.000113 (0.65)	2.12e-05 (0.76)	4.20e-05 (1.49)
M&A, lag1	0.0337 (1.62)	-0.00908 (-1.62)	0.00963*** (3.72)	-0.0248*** (-6.40)	-0.0265*** (-2.95)	0.159*** (5.61)	-0.0640* (-1.74)	0.00241 (0.30)	0.0150* (1.82)
M&A, lag2	-0.00173 (-0.09)	0.000952 (0.18)	0.00640*** (2.91)	-0.0118*** (-3.16)	-0.0366*** (-5.00)	0.0267 (1.04)	-0.0532 (-1.58)	0.00691 (0.95)	0.0182** (2.36)
M&A, lag3	0.0217 (1.28)	-0.00223 (-0.45)	0.00436** (2.04)	-0.0101*** (-2.85)	-0.0271*** (-4.35)	-0.00868 (-0.38)	-0.0319 (-1.08)	-0.00084 (-0.13)	0.00821 (1.20)
Constant	0.796*** (14.19)	0.0992*** (6.11)	0.0525*** (5.65)	0.0519*** (5.26)	0.0828*** (5.76)	0.0628 (0.96)	0.611*** (5.65)	0.145*** (8.48)	0.209*** (10.34)
Observations	35,319	35,319	35,319	35,319	34,378	35,338	4,715	35,319	35,268
Adj. R ²	0.178	0.073	0.055	0.055	0.033	0.022	0.120	0.146	0.182
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 12: Leverage levels upon CDS introduction, including partial-year dummy, with M&A transaction lags

This table presents the results of regressions of leverage on a dummy for the years in which a firm has active CDS trading, a dummy for the (partial year) year of CDS introduction, and control variables. All other variables are defined in Table 1. All independent variables are from the prior fiscal year. Regressions include year and firm fixed effects. Heteroskedasticity-robust *t*-statistics adjusted for clustering within firms are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	Book Leverage	Market Leverage
CDSactive	0.0201** (2.11)	0.0183 (1.62)
CDS_partial_year	0.0256*** (3.28)	0.0224** (2.25)
Ln(Assets)	0.0274*** (5.76)	0.0601*** (12.25)
PPE	0.129*** (5.73)	0.148*** (6.27)
EBIT	-0.0907*** (-7.16)	-0.115*** (-9.70)
Investment-grade	-0.0288*** (-3.77)	-0.0437*** (-4.82)
Rated	0.0539*** (6.37)	0.0568*** (6.12)
Median Industry Book Leverage	0.234*** (8.59)	
Median Industry Market Leverage		0.242*** (12.42)
Market-to-book	-0.000411 (-0.78)	-0.00199*** (-5.01)
Earnings Volatility	0.0157 (1.01)	-0.00350 (-0.25)
Abnormal Earnings	-0.00288 (-0.94)	-0.00684** (-2.15)
Tax Credits	9.862*** (3.86)	17.40*** (4.93)
Loss Carryforwards	0.000763 (0.17)	0.00560* (1.79)
M&A, lag1	0.0380*** (2.81)	0.00189 (0.16)
M&A, lag2	0.0398*** (3.16)	0.0195 (1.62)
M&A, lag3	0.0164 (1.39)	0.00609 (0.55)
Constant	-0.0309 (-0.89)	-0.256*** (-7.18)
Observations	24,247	24,199
Adj. R ²	0.073	0.187
Year F.E.	Yes	Yes
Firm F.E.	Yes	Yes

Appendix: Probit model for CDS trading/IV first-stage

Capex	-1.310** (-2.00)
Ln(Assets)	0.394*** (13.11)
PPE	0.137 (0.69)
Leverage	0.881*** (4.91)
EBIT	-0.962 (-1.24)
Working Cap.	0.0625 (0.24)
Cash	0.0811 (0.27)
Turnover	0.113** (2.12)
Ret. Earn.	-0.0452 (-0.91)
ROA	0.663 (0.81)
Volatility	-0.297** (-2.47)
Excess Ret.	-0.0202 (-0.69)
Inv. Grade	0.500*** (6.66)
Rated	1.260*** (13.34)
Lender FX	16.58*** (3.88)
Constant	-5.026*** (-15.86)
Observations	37,620
Pseudo R ²	0.535
Year F.E.	Yes
Industry F.E.	Yes