# Does a Market for Credit Protection Increase Employment Risk?

Guo Chen

Priyank Gandhi

Simi Kedia[1]

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**Abstract**

This paper looks at the introduction of Credit Default Swaps (CDS) and its effect on employment. CDS allow lenders to hedge their credit exposure making them tough negotiators in default. This increases the firm's likelihood of bankruptcy and increases employment risk that leads to employee attrition. Presence of tough creditors also gives incentives to firm to follow conservative policies to mitigate the increased likelihood of distress. This disciplining effect results in firms decreasing employment to contain operating costs. We find that growth in employment is 55% lower in the years after CDS trading relative to the unconditional mean in a matched sample. This decrease in employment is not accompanied by a decrease in capital expenditures. The lower employment growth is sustained over the long term and predominantly in firms with high yield debt. Firms with CDS trading are more likely to undertake efficiency increasing layoffs and experience an increase in capital intensity along with increases in labor and total factor productivity.

Keywords: CDS, Employment Risk, Layoffs, Financial Distress, Labor Productivity

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[1] Preliminary. Please do not cite, quote or circulate without the authors permission. All authors are from Rutgers University. Guo Chen can be reached at gc675@scarletmail.rutgers.edu. Priyank Gandhi can be reached at Priyank.gandhi@business.rutgers.edu and Simi Kedia can be reached at skedia@business.rutgers.edu. We thank John Wald and seminar participants at University of Kansas and University of Texas at San Antonio for their comments. We gratefully acknowledge the research support from the Whitcomb Center at Rutgers. All errors are ours.

Technological innovation changes the share of factor inputs, that is capital and labor, in the production process and impacts labor demand. A growing literature over the past decade has helped increase understanding of how technical progress and automation impacts labor outcomes. Financial innovation aims to reduce frictions in financial markets and alleviate financing constraints for firms. By potentially increasing access to capital for firms it can also impact labor outcomes. However, less is known about if and how financial innovation impacts labor outcomes.

In this paper, we examine the initiation of Credit Default Swaps (CDS) a major financial innovation in recent decades on the firm's employment. CDS allow creditors to hedge their credit risk alleviating financing frictions. The CDS market grew rapidly since its inception in the late nineties reaching a peak of about 60 trillion in 2007 and was about $30 trillion in notional value in 2022. Though the role of CDS in the Great Recession has sparked debate and regulation there is little known about its effect on firm's employment. [2]

The initiation of CDS trading impacts labor through potentially two related channels. As creditors can purchase CDS that entitle them to payoffs when the borrower default's they have fewer incentives to make debt renegotiations work making them tough bargainers during times of financial distress. These "empty creditors" as referred to by Hu and Black (2008) may even have incentive to push borrowers into default. Subrahmanyam, Tang and Wang (2014) empirically examine the introduction of CDS and document that firms with CDS trading see a decline in their credit ratings and an increase in the likelihood of bankruptcy.

[2] See for example "CFTC Chief Calls for new Credit Derivatives Rules" by Sarah N. Lynch and Brian Baskin on March 10, 2010 in the Wall Street Journal.

An increase in the likelihood of financial distress increases employment risk. Employees face substantial losses when their firms are in financial distress and go through bankruptcy. Matsa (2018) argues that increased employment risk from higher leverage and financial distress causes employees to leave the firm and demand higher wages to compensate for the increased risk. As CDS initiation increases the likelihood of bankruptcy there is likely to be greater employee attrition after the introduction of CDS. We refer to this as -the *Distress* channel. This impact on employees is exemplified by the case of YRC worldwide. YRC looking to restructure its debt after its economic troubles in the 2008 recession found that a small group of investors, that held CDS contracts would not consent to the restructuring. The restructuring was eventually successful after Teamsters, the labor union got involved by protesting outside the office of New York hedge fund Brigade capital one of the alleged holdouts.[3] By one account, Hoffa, president of the Teamsters Union "pulled out all the political stops" and put very public pressure on several financial institutions to stop purchases of CDS on YRC.[4]

Another implication of having "empty creditors" is that the borrowers are aware that creditors will be tough bargainers in financial distress and thus have greater incentive to avoid states that require such renegotiations. This ex-ante disciplining role of CDS contracts wherein borrowers put in greater effort to avoid poor outcomes emerges from theoretical models of Bolton and Oehmke (2011) and Campello and Matta (2013). This disciplining role of CDS has not been explored much in prior literature with the exception being Subrahmanyam, Tang and Wang (2017) who document that CDS initiation results in firms becoming more conservative and increasing their cash holding to boost liquidity. This channel, referred to as *Disciplining* channel

[3] See "YRC and the Street's Appetite for Destruction" by Dennis K. Berman published in the WSJ on Jan 5, 2010. The article is available at https://www.wsj.com/articles/SB10001424052748704350304574638750418217422
[4] See "Crisis at YRC having ripple effect on Labor" by Mark B. Solomon on April 5, 2010. Available at https://www.dcvelocity.com/articles/24956-crisis-at-yrc-having-ripple-effect-on-labor

implies that firms with CDS trading have greater incentives to reduce employment to decrease operating costs. As CDS trading continues once initiated, the *Disciplining* effects firm's employment decisions over the firm's life

We examine the effect of CDS initiation on employment. The sample includes all firms from Compustat that meet our data requirements over the period 1995 to 2022. The data on CDS is from Markit and includes initiation of CDS trading over the 2001 to 2020 period. We use data on the number of employees from Compustat to calculate the *Change in Log Employment* and the *Hire Rate*. To capture the effect of CDS initiation we include *CDS Trading*, a dummy variable that takes the value of one if the firm has CDS trading in that year and zero otherwise. We include year fixed effects to control for economy wide factors like recession, firm fixed effects to control for time invariant firm characteristics along with time varying firm level factors that might influence employment. We find significantly slower employment growth after the initiation of CDS trading. We supplement data on total number of employees with hand collected data on layoffs from Capital IQ Key and continue to similar results, that is, firms are more likely to announce a layoff after CDS initiation.

CDS initiation is not random and firm characteristics that are related to the initiation of CDS trading may also influence the hiring practices of firms. In line with the prior literature that has examined the impact of CDS initiation, we estimate the model in a propensity score matched sample. We continue to find similar results and the effect is economically significant. The estimated coefficient of *Hire Rate* in the matched sample implies that employment growth after the initiation of CDS trading is 55% lower than the unconditional mean. The results are robust to alternate matching criteria as well as to an instrumental variable estimation.

The lower growth rate of employment could potentially arise if investment opportunities decline after CDS initiation. We therefore estimate a model for investment, captured by the ratio of capital expenditures to property, plant and equipment (referred to as *CAPX/ PPE*) and find no evidence of a decline in investment after the initiation of CDS trading. As the lower employment growth after CDS initiation is not accompanied by any decline in the growth of physical capital the results are unlikely to be due to a decline in firm's investment opportunities.

Prior literature that has examined the effect of financial distress on labor examines credit events like violation of debt covenants or bankruptcy to document its effect on employment. CDS initiations differ from credit events in two aspects. First, in contrast to credit events which occur during times of economic distress, CDS initiation is not confined to firms in economic hardship. Several firms with investment grade debt also see the initiation of CDS on their debt. Consistent with CDS initiations not impacting the likelihood of financial distress for investment grade firms materially, we see no evidence of employment declines in these firms. Secondly, once initiated CDS trading continues impacting the firm over the long term and in line with this we find sustained lower growth of employment over the life of the firm.

The *Disciplining* effect whereby firms follow conservative policies to avoid states that require debt renegotiation implies that reduction in employment will be more proactive and responsive to economic conditions. A text analysis of the layoff announcement shows that firms with CDS trading do not differ from control firms in undertaking layoffs to address lower demand but are significantly more likely to implement efficiency and reorganization related layoffs. We also examine and find that employment decision in firms with CDS trading are more sensitive to growth especially in downturns. They reduce employment faster than control firms in downturns and do not differ from control firms in periods of high growth. Consistent with CDS

firm's reducing employment but not capital, we find that the firm's capital intensity increases after the introduction of CDS. Further, we find that both labor productivity and total factor productivity (TFP) increases after CDS initiation and this evidence of more efficient utilization of inputs supports the *Disciplining* effect from CDS trading. Robustness tests with alternate matching procedures, excluding years of the financial crisis among others provide similar results.

The paper makes several contributions. First, we are among a few that examine the impact of financial innovation on labor. Our results suggest that financial innovation that strengthens the position of capital providers is associated with slower employment growth and an increase in capital intensity over time. The evidence in the paper suggests that the discipline arising from CDS leads to an increase in labor productivity as well as an increase in TFP. The paper also contributes to the emerging literature that has examined the implication of CDS trading on capital structure and other firm policies. This literature, discussed later, has examined the effect of CDS initiation on debt policy, payout and disclosure policies among others. Our paper is the first to examine the implication of CDS trading on labor and among very few that examine the potential disciplining role of CDS. The paper also contributes to the literature that has examined the effect of financial distress on labor. Using CDS initiation to capture an increase in the likelihood of financial distress allows us to examine the effect of sustained increase in financial distress for a range of firms that vary in their proximity to economic distress in the long term.

The rest of the paper is as follows. The next section discusses the related literature, followed by Section 3 that discusses the data and presents the base empirical results. Section 4 controls for endogeneity, Section 5 examines the dynamics of employment decline, Section 6

examines the implication of the disciplining effect on firm employment, Section 7 does robustness tests and Section 8 concludes.

## 2. Literature Review

CDS allow lenders to hedge their credit exposure and alleviate financial frictions (Duffee and Zhou (2001), Parlour and Winton (2013)). Hedging of credit risk reduces creditor's incentives to renegotiate debt when firms face financial distress. These insured creditors receive payoffs when the firm defaults and have less to lose from the failure of debt renegotiations. If creditors are overinsured, that is receive higher payoffs in default than the value of their claims, they may even be willing to push the firm into bankruptcy (See Hu and Black (2008) and Bolton and Oehmke (2011)). Insured creditors that are less impacted by failed debt renegotiations increase the likelihood of bankruptcy. Consistent with this Danis (2016) finds that participation rates in distressed exchange offers reduce after CDS introduction making out of court debt restructuring more difficult. Subrahmanyam, Tang, and Wang (2014) also document that the credit rating of the firm declines and the likelihood of bankruptcy increases after CDS initiation. This increase in the likelihood of bankruptcy is further aggravated by the possibility that some CDS purchasers are not the firm's creditors and may have other conflicting incentives.[5]

This increased likelihood of bankruptcy increases employment risk. Employees face substantial losses when their firms are in financial distress and go through bankruptcy. Labor market frictions complicate transition to another job resulting in large losses for employees that are displaced (See Davis and von Wachter (2011) among others). Brown and Matsa (2013)

[5] Wirz et. al. (2014) discusses the case of Forest Oil Corp., that was struggling and proposed to merge with a healthier competitor Sabine Oil and Gas. Investors who had purchased CDS contracts were building an equity stake in the firm to vote down the merger and push the firm towards default (See https://www.wsj.com/articles/credit-default-swaps-get-activist-new-look-1419379954?mod=Searchresults_pos17&page=1 ).

document that firms going through distress find it difficult to attract employees and show that this reduction is tied to a loss of job security. Matsa (2018) argues that increased employment risk arising from a higher likelihood of financial distress causes employees to leave the firm and demand higher wages to compensate for the increased risk.[6] Graham, Kim, Si and Qiu (2023) report that 76% of workers separate from bankrupt firms within three years of a bankruptcy filing.[7] If the likelihood of bankruptcy increases after CDS introduction, then there will be higher attrition of employees after the initiation of CDS trading – referred to as the *Distress* Channel.

This effect on employment arising from increased likelihood of financial distress is related to a prior and emerging literature that has examined the effect of financial distress on labor. This prior literature has examined financial distress triggered by credit events. As credit events are often accompanied by economic distress the challenge for this literature is the need to control for economic conditions as firms going through economic downturn are both more likely to face financial distress and have lower demand for labor. Agarwal and Matsa (2013) use change in state unemployment insurance laws to identify an exogenous decrease in employee unemployment risk and find that it results in an increase in corporate leverage. Falato and Liang (2016) use regression discontinuity and examine the effect of covenant violations to document that it causes loss of employment at the firm. We contribute to this literature by using CDS trading to capture an increase in financial distress. In contrast to credit events, CDS initiation is not restricted to firms experiencing economic downturns. This allows us to identify an increase

[6] Labor market frictions that make job loss and unemployment costly for labor imply that firms take these into account in their capital structure decision. Titman (1984) and Berk, Stanton and Zechner (2010) model the effect of labor market frictions on firm's capital structure decisions.

[7] Studies have also examined the effect of financial distress on the quality of the labor force. Brown and Matsa (2016) find that firms in distress are unable to attract higher quality employees. Baghai et. al. (2012) document that firms lose workers with the highest skill in bankruptcy. We do not study the effect of CDS introduction on the quality of the labor force.

in the likelihood of financial distress over a range of firms that vary in their proximity to default. Further unlike credit events, CDS trading continues after its initiation and captures sustained increase in likelihood of financial distress rather than a discrete spike. This allows us to study the long-term effect of an increase in the likelihood of financial distress on employment.

CDS trading and the consequent increased bargaining power of creditors also effects firm policies and impacts employment through these policies. Bolton and Oehmke (2011) and Campello and Matta (2021) model the effect of CDS trading and document an ex-ante disciplining effect of CDS trading. In the presence of tough creditors firms, aware of the increased difficulty in debt renegotiations, follow conservative policies to reduce the likelihood of such renegotiations. In line with this disciplining effect, Subrahmanyam, Tang and Wang (2017) document that firms increase cash holdings to improve liquidity after the introduction of CDS and Dai et. al. (2023) find that firm's reduce cost stickiness to mitigate risk after CDS initiation. If firms with CDS trading are motivated to mitigate the risk of a higher likelihood of bankruptcy they may reduce employment to contain operating costs.

Though the presence of tough insured creditors creates incentives for firms to follow conservative policies, a lack of monitoring by these insured creditors also creates incentives for risk shifting. Prior studies have examined this potential for increased risk taking with Martin and Roychowdhury (2015) finding that firms follow less conservative accounting policies and Chang et. al. (2019) documenting that firm take on more risky and original innovations, though not more R&D expenditures after CDS introduction.[8] This evidence, seemingly at odds with the disciplining effect of Bolton and Oehmke (2011) may arise because accounting policies are less

[8] Papers also explore how reduced monitoring by debtholders changes the incentives of equity holders. Kim et. al. (2018) find that equity holders ask for and get more voluntary disclosures from firms after CDS initiation. Lee and Oh (2021) and Landsman et. al. (2022) find that firms increase payouts to shareholders after CDS introduction.

likely to increase operating risk.[9] Further, Gilje (2016) examines risk taking behavior as firms approach distress and finds that in contrast to risk shifting theories firm reduce risk through their investment decisions. Andrade and Kaplan (1998) also do not find any evidence of risky investments in a sample of financially distressed firms. These studies further suggest that firms with CDS trading are likely to mitigate risk by following conservative policies – referred to as the *Disciplining* Channel.

An implication of the *Disciplining* Channel is that CDS firms wanting to reduce operating costs may be more proactive in reducing employment. The focus on decreasing operating leverage to mitigate the risk from increasing likelihood of distress may make employment decision more sensitive to economic conditions, especially in downturns. Conservative hiring policies may also induce firms to take steps to increase labor productivity. We examine these implications of the *Disciplining* Channel later in the paper.

**3. Data and Base Model**

The data on CDS initiations is from Markit and spans the period from 2001 to 2020. Majority of the CDS initiations happened over the 2001 to 2004 period (See Table 1) with firms being added slowly and steadily over the later part of the sample. The CDS firms are distributed across industries with higher numbers from Oil and Gas Extraction, Chemicals and Allied Products, and Business Services (See Appendix Table 1).

We get data for firms that have CDS initiations and other firms from Compustat over the period 1995 to 2022 so that we have data for at least five years before CDS initiation and as

[9] Cheng et. al. (2019) find no significant increase in total R&D expenditures. However, if risk shifting incentives dominate incentives for conservative policies then this will further increase the likelihood of bankruptcy and unemployment risk, and continue to have a negative effect on employment through the *Distress* channel.

many years after as possible. In line with prior papers that have examined CDS initiations we remove financial firms and utilities. Consistent with Falato and Liang (2016) that examine the effect of covenant violations on employment we remove firm years with less than 10 employees and those where absolute asset growth is greater than 100%.

We capture change in employment by the annual *Change in Log Employment*. We also calculate the *Hire Rate*, which is the change in employment scaled by the average number of employees in the year of and the prior year.[10] The *Hire Rate*, also used by Belo, Lin and Bazdresch (2014) captures the percentage change in the number of employees. On average, the *Hire Rate* for firms over the sample period is 3.33% (see Table 2)

*3.1 Full Sample Estimation*

We begin by reporting a model for employment change after CDS initiation in the full sample. To capture the effect of CDS trading we create a dummy variable *CDS Trading* that takes the value of one in all years, not including the year of initiation, that the firm has CDS trading and zero in the years that there is no CDS trading. For Non CDS firms *CDS Trading* is always zero. We estimate an OLS model where the dependent variable is *Change in Log Employment* or *Hire Rate*.

We first estimate a model with no control variables and with year and firm fixed effects. Year fixed effects capture economy wide factors like a recession while firm fixed effects capture time invariant firm level characteristics. As can be seen in Model 1 of Table 3, the coefficient of *CDS Trading* is negative and significant, both for *Change in Log Employment* (Panel A) and *Hire Rate* (Panel B).

[10] Specifically, *Hire Rate* $= H_t / [0.5 \times (N_t + N_{t-1})]$ where $H_t = N_t - N_{t-1}$ and $N_t$ is the number of employees in year t.

We then include firm characteristics, specifically log of total assets and return on assets (ROA) to control for size and profitability. We control for growth opportunities, as firms that are growing are more likely to hire employees, by including the *Market to Book* ratio and *Sales Growth*. As the prior literature shows that CDS initiation impacts firm *Leverage*, we include the ratio of long-term debt to assets, and *Tangibility* the ratio of fixed assets to total assets. We also include the *Stock Volatility* of stock return to capture business uncertainty. We continue to include year and firm fixed effects. As seen in Model 2, including time varying firm characteristics improves the fit of the model slightly but does not make a material difference to the estimated coefficient of *CDS Trading* which continues to negative and significant.

In model 3, we include industry fixed effects (two digit SIC) along with year fixed effects. We find that the inclusion of industry fixed effects does not materially impact the estimated coefficient of *CDS Trading* which continues to be negative and highly significant. The coefficients of other variables are as expected and in line with prior papers. Larger firms grow employment more slowly while profitable firms hire at a higher rate. Firms with higher leverage and greater stock volatility hire at a slower pace. As the overall fit of the model is better with firm fixed effects, going forward the estimation includes year and firm fixed effects.

A smaller change in employment for firms after CDS initiation could be due to lower investment opportunities for these firms rather than the presence of CDS trading. To examine this, we model investment in capital by the ratio of capital expenditures to beginning year gross PPE, referred to as *CAPX/ PPE*. As seen in the last column of Table 3, there is no significant change in capital expenditures for firms after CDS initiation. As the lower employment growth after CDS introduction is not accompanied by lower capital expenditures it is not consistent with declining investment opportunities.

Firms report the number of employees annually and the Compustat based measures capture the net change in the number of employees. We create an alternate measure of employment loss by searching for firm level layoff information. Layoff information is manually collected from the Key Development Section in Capital IQ. We collect data on all news items that have layoff related information.[11] We create *Layoffs* a dummy that takes the value of one if the firm announces a layoff in the year.

The results for *Layoffs* are reported in Table 4. Model 1 reports the results of an OLS estimation that includes the control variables discussed above along with year and firm fixed effects. The coefficient of *CDS Trading* is positive and significant, that is firms are more likely to announce layoffs after the initiation of CDS trading. The results are materially similar when we include industry fixed effects (Model 2) and estimate a logit model (Model 3). Going forward we use the logit model with industry fixed effects as our base specification for layoffs and OLS model with industry fixed effects when we estimate models with interaction effects.

**4. Controlling for selection into CDS Initiation**

As initiation of CDS trading is likely not random but a function of firm characteristics, in this section we control for endogeneity of CDS initiation. In line with prior studies that have examined the effect of CDS initiations we create a propensity score matched sample and estimate models for employment growth in the matched sample. We also estimate an Instrument Variable (IV) model both of which are discussed below.

[11] We search for layoff information by keywork search that include words like layoff, laying off, dismissed, firing, redundant, retrenchment, discharge, axed, sacking among others. We collect the number of news articles that had a layoff announcement in the year as well as manually collected the number of employees that were to be laid off. We use a *Layoffs* dummy rather than the number of employees laid off as this ensures that a few extreme observations do not account for the results. However, the results are qualitatively similar if we use the number of employees, or the number of layoff news items to capture layoffs.

*4.1 Propensity Score Matched Sample*

To estimate the likelihood of CDS initiation, we estimate a probit where the dependent variable is *CDS Trading* that takes the value of one in the years with CDS trading. We exclude years after the initiation year of CDS firms from the estimation. Non CDS firms are included for the full sample period (See Subrahmanyam, Tang and Wang (20140 and Chang et. al (2019) among others).

We include firm characteristics that the prior literature has included in the probit model to predict CDS initiation. Specifically, we include *Rated* a dummy variable that takes the value of one if the firm has an S&P rating on its debt and zero otherwise. We also include *Investment Grade*, a dummy that takes the value of 1 if the firm's debt is deemed investment grade by S&P that is rated BB+ or higher. We also include Log of total assets, ROA, leverage, tangibility, market to book, sales growth, and stock volatility as explanatory variables in the probit. We do not match the variables of interest that is employment or change in employment. We include year and industry fixed effects in the probit estimation. The results of the probit model are in Appendix Table 2. In line with prior studies, we find that larger firms, those with higher leverage and those who have debt that is rated are more likely to have CDS initiation. Stock volatility negatively impact the likelihood of CDS initiation.

We match every CDS firm to a Non CDS firm that has the closest likelihood of CDS initiation in the year prior to the initiation. We match with replacement and allow firms that begin CDS trading six years or later to be matched as control firms. To ensure that we have good matches we require the matched firm to be from the same two digit SIC as the reference firm. This leads to a match for 684 CDS firms. Panel A of Table 5 lists the difference in firm characteristics between CDS and Non CDS firms in the year prior to initiation. Like prior

literature we find that there are differences between the two sample though the overall propensity for CDS initiation is not significantly different.

We do not include our variable of interest in the probit for CDS initiation. We check and find that overall employment is higher at CDS firms which is not surprising since these tend to be larger firms that have more employees and are also more likely to get CDS initiation. Though total employment is higher, the rate of change of employment as captured by *Change in Log Employment*, *Hire Rate* and *Layoff* dummy is not different between the two groups. As we study the change in employment after CDS initiation the treatment firms do not have any pre trend in the variable of interest. To address concerns that the selection criteria may account for the results we also implement a stricter and less strict matching criteria that we discuss later in the robustness section.

We estimate the response of employment to CDS initiation in the propensity matched sample. We include all years for the CDS firm that was successfully matched along with all the years of the matched control firms. As for the full sample, *CDS Trading* takes the value of one for all years with CDS trading. Change in employment is captured by *Change in Log Employment, Hire Rate* and *Layoff Dummy* that are defined as before. We include the same control variables and fixed effects.

The results are reported in Table 6. The coefficients of *Change in Log Employment* and *Hire Rate* are negative and significant. The estimated magnitude is smaller than that in the full sample. The coefficient of *CDS Trading* in Model 2 is -0.017 implying that *Hire Rate* in the years with CDS trading is 55% lower than the unconditional mean for this sample.[12] Overall, the

[12] The mean *Hire Rate* for the propensity matched sample of firm years is 3.05%.

fit of the model and the significance of the different firm characteristics in explaining employment changes is qualitatively similar to that of the full sample model presented in Table 3. The logit estimation for the *Layoff* dummy in Model 3 also shows a significantly higher likelihood of layoffs after CDS initiation. The significantly slower growth in employment is not accompanied by a decline in capital expenditures (Model 4). This is consistent with results from the full sample that lower employment growth after CDS initiation is not accompanied with lower capital expenditures.

*4.2 The IV Estimation*

We also estimate an IV model for robustness. As banks that hedge one component of their portfolio are more likely to hedge other components of their portfolio, Saretto and Tookes (2013) instrument the likelihood of CDS trading by the foreign exchange (FX) derivative usage of the firms lead bankers and underwriters. FX derivative positions of the firm's bankers and underwriters should be related to the likelihood of hedging with CDS contracts (meeting the relevance condition) and should not be directly related to firm's employment decision (meeting the exclusion restriction). In line with Saretto and Tookes (2013) we construct *Bank FX* as an instrument for CDS initiation.[13]

As seen in Table 7, Model 1 the coefficient of *Bank FX* is positive and significant in the first stage. Firms with creditors that use FX derivatives for hedging are more likely to have CDS traded on their debt. In the second stage, the coefficient of the *Instrumented CDS Trading*

[13] For all firms in our full sample, we obtain data on the lead syndicate banks from Dealscan. From FISD we obtain data on the firm's bond underwriters. We then link the data to the Federal Reserve's Call Bank Holding Company data to get data on the notional value of foreign exchange derivatives positions not for trading. The instrument, *Bank FX*, is the average fraction of FX derivatives to total assets for all bank holding company that have served as lead bank or bond underwriters in the last five years. We lose observations in matching Compustat/ CRSP data to Dealscan and FISD and also due to missing values of FX derivatives.

is negative and significant in the estimation of *Change in Log Employment* and *Hire Rate*, and positive and significant in the estimation of *Layoffs* . These results show that after controlling for the endogenous decision to begin CDS trading, CDS trading results in lower employment growth. The coefficient of the *Instrumented CDS Trading*, in the model for *CAPX/ PPE* (Model 4) is positive and marginally significant implying that firms with CDS trading increase capital expenditures. These results reaffirm prior results that the slower employment growth is not accompanied with lower capital expenditures.

## 5. Employment Dynamics with CDS Initiation

The above results show that initiation of CDS trading is followed with slower employment growth. This is consistent with prior studies that have examined the effect of financial distress on labor by studying credit events like violation of debt covenants (Falato and Liang (2016)), bankruptcy (Graham et. al (2023) and roll over risk during the Great Depression (Benmelech et. al. (2019)). As discussed above CDS initiations are different from credit events in that they do not always accompany economic distress and the increase in likelihood of financial distress continues over the life of the firm. In this section, we examine the implications of these differences.

### *5.1 CDS Initiations and Economic Distress*

CDS initiations do not always target firms in economic distress and are often initiated on firms that are healthy with their debt having an investment grade rating. As firms with an investment grade credit rating have an ex-ante low likelihood of financial distress any increase in the likelihood of financial distress arising from the introduction of CDS is likely to be small and unlikely to have a large impact on employment. The effect of CDS introduction is likely to be

larger for firms that are riskier and who experience increases in the likelihood of financial distress to levels that are material for employment risk. We create an *Investment Grade* (*High Yield*) dummy that takes the value of one if the firm's debt rating was (not) investment grade in the year prior. We then examine the response of *Investment Grade* and *High Yield* firms to *CDS Trading* by including their interaction in the estimation. As seen in Panel A of Table 8, lower employment growth is seen only for the *High Yield* group with no significant impact on the *Investment Grade* group.

*5.2 Short vs. Long Term effect on Employment*

Any effect of CDS initiations on firm employment in not just confined to the years after initiation but sustains over the long run. The variable *Short Term* (*Long Term*) take the value of one if the firm has CDS trading and is less than three (three or more) years from CDS initiation. As seen in Panel B of Table 8, we find that the *Short Term* employment reaction is muted. The coefficient for *Change in Log Employment* and *Hire rate* both are not significant in the short term and the coefficient of *Layoff*s being marginally significant. However, in the long term, there is strong significant evidence of lower employment growth and a continued higher incidence of layoffs. The muted short-term response is not unexpected as CDS initiation on average does not accompany economic or financial distress reducing the need for an immediate employment response. However, for firms with *High Yield* debt who may face higher likelihood of financial distress after CDS initiation there is a significant short-term response along with a long term response (See Appendix Table 3).

*5.3 Unionization*

We also examine if unionization impacts the effect of CDS initiation on employment. Unions provide employees with greater job security which may mitigate the increase in employment risk arising from an increase in the likelihood of financial distress. In contrast, firms may use the presence of tough insured creditors to bargain for employment reduction from unions (See Matsa (2010)).[14]

To examine the role of unionization, we follow prior literature and use industry unionization rates to proxy for power of unions at the firm level (see for example Falato and Liang (2016) and Klasa, Maxwell and Ortiz-Molina (2009)).[15] Matsa (2006) documents that using firm or industry level data to examine the effect of unions on firm corporate policy gives similar results. We use union membership to proxy for union power.[16] Union membership is the percent of employed workers that are members of unions. We construct *High* (*Low*) *Union* dummy that takes the value of one if the CDS firm belonged to an industry that had greater than the median union membership in the prior year.[17] As seen in Panel C of Table 8, both the high and low union groups experience significantly lower employment growth. The coefficient of *Layoffs* is positive for both groups but significant only for the *High Union* group that is consistent with prior literature that finds a higher propensity of layoffs for unionized firms.[18]

[14] Matsal (2010) among others finds that firm use leverage to improve their bargaining position with unions.
[15] Klasa et. al. (2009) finds that firms facing strong unions strategically hold less cash reserves to improve their bargaining position against unions.
[16] Data for industry unionization rate from https://www.unionstats.com/. This data is maintained by Barry T. Hirsh, David A. Macpherson and William E. Even from data published by the Bureau of Labor Statistics. For the period 1998 to 2002, we use the CIC to SIC link file to obtain data for SIC of our sample firms. From 2003 onwards, the data is matched at the NAICS level. Note that non union members may be part of collected bargaining agreements.
[17] For this test we categorize firms into High and Low Union groups every year.
[18] See for example Baumol et. al. (2003) and Lalonde et. al. (1996). However, Tinsley (2004) does not find significant evidence that unions impact employment.

## 6. Disciplining Effect of CDS Trading

As discussed earlier, CDS initiations are likely to make firm policies more conservative to reduce the likelihood of financial distress. Firms following conservative policies are likely to increase cash holdings (see Subrahmanyam et. al, (2017)) and may be more proactive in reducing operating costs and employment. In this section, we examine changes in firm's employment policies after CDS initiations.

### *6.1 Nature of Layoffs*

Firm usually announce layoffs when faced with deteriorating economic conditions and in more recent times have also been increasingly engaging in efficiency related layoffs (See Farber and Hallock (2009). Firms with CDS trading with tough creditors are likely to undertake layoffs more proactively and before economic conditions worsen, that is engage in efficiency related layoffs. Firms with CDS trading looking to reduce operating costs are more likely to restructure and adopt cost cutting measures even outside of recessions and downturns. To examine the motivation behind the layoffs, we do a text analysis of the layoff announcement. We create the variable *Demand Layoff* that takes the value of one if the firm announces a layoff in response to declining demand. The variable *Efficiency (Restructuring) Layoff* takes the value of one if the layoff aims to reduce costs and improve efficiency (restructure and reorganize). We also combine the efficiency and restructuring motivated layoffs as both often aim to streamline operations to create a joint category referred to as *Efficiency and Restructuring Layoffs*.[19] In our

[19] We classify a layoff as motivated by declining demand if the announcement contained words like "decline in", "poor performance", "recession", "slump" among others. We classify a layoff as motivated by efficiency if the announcement contained words like cost, efficiency, streamline, strategic, competitive among others. Layoff announcements that contained words like restructure, reorganize, relocate, close among others were classified as restructuring Layoffs. For a list of all words see Appendix A.

sample, about 10% of layoffs are classified as *Demand* and about 20.1% (28.4%) are classified as *Efficiency* (*Efficiency and Restructuring Layoffs)*.

As seen in Panel A of Table 9, there is no difference between firms with *CDS Trading* and control firms in the likelihood of a *Demand Layoff*. However, firms with *CDS Trading* are significantly more likely to have *Efficiency* and *Efficiency and Restructuring* related layoffs. The results also hold in the full sample (Panel B). The results suggest that after CDS initiation firms implement layoffs not only in response to reduced demand but more actively to achieve efficiencies and reduce operating costs.

*6.2 Sensitivity to Economic Conditions*

The discipline arising from the presence of tough creditors is likely to make the employment decision more sensitive to firm's growth opportunities. All firms facing lower growth reduce or stop hiring and this sensitivity is likely to be higher for firms with CDS trading especially on the downside as they are likely to be faster in reducing their operating costs when economic prospects begin to decline.

To examine the firm's sensitivity to periods of low and high firm growth we calculate the average sales growth over the past three years, referred to as *Sales Growth (3 Yr)* and include it and its interaction with *CDS Trading* in our estimation.[20] As seen in Panel A of Table 10, the coefficient of *CDS Trading* is negative and significant as firms with *CDS Trading* have lower employment growth. The coefficient of *Sales Growth (3 Yr)* is positive and significant and its interaction with *CDS Trading* is also positive and significant. Firms hiring decisions are positively related to sales growth with firms hiring more during periods of high sales growth.

[20] In this specification we do not include lagged one year sales growth as a control.

The positive significant interaction points to a higher sensitivity of employment to firm's growth prospects for CDS firms.

As firms with *CDS Trading* have incentives to avoid states with poor outcomes, we expect this greater sensitivity to sales growth to be stronger in downturns, that is they should be faster to reduce employment when growth declines relative to hiring when growth is high. We create a *Low* (*High*) dummy that takes the value of one if *Sales Growth (3 Yr)* is (not) in the bottom tercile for all firms in the industry in that year and include its interaction with *CDS Trading*. As seen in Panel B, the coefficient of the interaction term is positive and significant for the low sales growth group but is not significant for the high sales growth group. This asymmetric response of employment to sales growth is consistent with increased discipline due to the initiation of CDS trading. Firms with *CDS Trading* shed labor at a higher rate in response to periods of slow growth relative to control firms and do not differ from control firms in employment decision in periods of high growth. The results are similar when we capture employment changes by *Change in Log Employment* or *Hire Rate*. Though the coefficients are in the right direction they are not significant for the *Layoff* Dummy. *Layoffs* are rare events reducing the power of these tests.[21]

We estimate the same specification for CAPX/PPE and find that it is also more sensitive to firm growth in the presence of *CDS Trading*. However, this greater sensitivity is not seen during low growth period but is coming from the high growth period. In sum, firms with *CDS Trading* shed labor faster during periods of low growth and invest in physical capital faster during periods of high growth relative to control firms.

[21] The results are tabulated from an OLS estimation and not a logit estimation as the specification includes interaction variables.

*6.3 Impact on Productivity*

The results so far show that firms with *CDS Trading* have lower labor growth but similar capital investments relative to control firms. This suggests that capital intensity increases in firms after CDS initiation. We measure *Capital Intensity* as the ratio of average PPE to average number of employees. Average PPE (number of employees) is the average of beginning and end of year values. We estimate a model of *Capital Intensity* and include control variables from prior estimations along with firm and year fixed effects. As expected and consistent with the prior results, we find that *Capital Intensity* increases significantly after CDS initiation both in the matched sample (Panel A) and the full sample (Panel B) as seen in Column 1 of Table 11.

Prior literature documents that financial distress results in suboptimal employment decisions with firms losing their more productive employees (See Caggesse, Cunat and Metzger (2018) and Baghai, Silva, Thell and Vig (2021)). If the employment policy of firms with *CDS Trading* is influenced by heightened *Distress* costs they may lose their more productive employees, who are more likely to find alternative employment, and result in lower labor productivity at the firm. In contrast, the *Disciplining* channel suggests that firms will proactively hire and fire workers to reduce operating costs and increase labor efficiency resulting in higher productivity. We measure *Labor Productivity* as the ratio of sales to average employment and find that *Labor Productivity* significantly increases after CDS initiation consistent with the *Disciplining* Channel (See Column 2).

Lastly, we examine if the increase in labor productivity is accompanied with an increase in total factor productivity that capture the overall effectiveness with which both capital and labor are used in the production process by the firm. As we use Compustat data to calculate total factor productivity, we follow prior literature and calculate three proxies for total factor

productivity. The first measure is straight forward and is the ratio of sales to assets, referred to as *Sales/ Assets*, that has also been used by Bennett, Stulz and Zhang (2020)). The second measure, referred to as *TFP* uses residuals from a regression of sales on capital, labor and inventory (See Campello et. al. (2023)).[22] Lastly, we implement the Ackerberg, Caves and Frazer (2015) correction to the estimation of total factor productivity that accounts for the endogeneity of the investment decision and this measure is referred to as the *TFP (AFC)*.[23] The results with the estimation of these three proxies of total factor productivity are displayed in Table 12. We find that all three measures of total factor productivity significantly increase after CDS trading in the matched sample (Panel A). The coefficient for all three measures of total factor productivity is positive in the full sample (Panel B) but significant only for one measure.

These results suggest that the ex-ante discipline that comes from the presence of tough creditors after the introduction of CDS trading is associated with a slower growth of employment that results in greater labor productivity and some evidence of higher total factor productivity.

## 7. Robustness

In this section, we do some robustness tests to examine if our results are sensitive to the assumptions and empirical decisions made in the estimation.

### *7.1 Criteria for Propensity Score Matching*

[22]Specifically, we estimate the following regression: $Log\ Sales_{it} = Log\ Employees_{it} + Log\ Capital_{it} + Log\ Inventory_{it} + \epsilon_{it}$, where capital is the average value of gross PPE, employees (inventory) is the average number of employees (inventory). Average is over the beginning year and end of year value. Measure of TFP is the residuals from the above estimation.

[23] The crux of the identification problem is that firms choose labor and capital inputs and these may reflect the firm's knowledge of unobservable productivity shocks making these correlated, and resulting in the inconsistent OLS estimates for the coefficients of labor and capital (See Ackerberg, Caves and Frazer (2015) for further details). We use PRODEST the Stata function that implements the correction. For further details of PRODEST see https://econpapers.repec.org/software/bocbocode/s458239.htm

The result that employment declines in firms after CDS introduction holds in the full sample, in the propensity matched sample as well as in 2SLS estimation as discussed above. However, to ensure that the results are robust to alternate matching criteria we also implement two other matching procedures. The first, that is stricter, requires that the matched Non CDS firm not only be from the same industry but also that the matched firm's overall propensity for CDS initiation be within 10% of the reference firm. This results in a much smaller sample of CDS firms that are matched. As seen in Panel B of Table 5, only 234 CDS firms are matched to Non CDS firms. The tighter match however results in a sample of matched firm that are very similar in firm characteristics. Second, we also implement a one to many match that has the advantage of not eliminating well matched firms because they were not the closest match. Specifically, we require that the matched Non CDS firms are from the same industry but we include the top three matches that qualify. This allows the 684 CDS firms to be matched to 1158 unique Non CDS firms. The difference in firm characteristics between the two groups, that is reported in Panel C of Table 5 is similar to that seen in our base matching criteria. The CDS firms are larger than the Non-CDS firms and also have more total employment than Non CDS firms. However, there is no statistical difference between the two groups in the *Change in Log Employment, Hire Rate* or *Layoff* dummy.

Results in these two matched samples are reported in Table 12. Panel A reports the results of the stricter matching procedure. The estimated coefficients of *CDS Trading* are similar in magnitude to the base matching criteria reported in Table 6. As the sample is smaller the estimated standard errors are larger making the coefficient for *Change in Log Employment* significant only at the 10% level. However, the coefficient of *CDS Trading* is significant at the 1% level for the *Layoff Dummy* even in the smaller stricter matched sample. Panel B reports the

results for the one to many match and the coefficient of *CDS Trading* is negative and significant for all specifications. This mitigate concerns that the results are influenced by the propensity matching procedures.

*7.2 Excluding the Financial Crisis*

The sample period encompasses the financial crisis of 2008-2009 and raises the possibility that the results are due to sharp employment losses during this time period. We estimate our base model excluding the years of 2008 and 2009 and find that results continue to hold and are qualitatively similar (See Panel A, Table 13)

*7.3 Noise in the Initiation of CDS Trading*

The CDS market began in in 1997 and grew rapidly in 2000 and later (See Subrahmanyan et. al. (2014)). As the Markitt data begins in 2001 one concern is that all firms with CDS initiation prior to 2001 may be in the dataset with initiation in January 2001 the earliest possible date. This error classifies some years with CDS trading as potentially non-CDS years. As we examine the long run impact of CDS trading this is less of a concern. To examine if this is impacting our results, we estimate our base model excluding all CDS initiations in January of 2001. As seen in Panel B of Table 14, this does not materially change the results.

**8. Conclusions**

We use CDS initiation as a novel way to identify the increase in the likelihood of financial distress. We find that firms with CDS trading have lower employment growth that is muted in the short term but is significant and persistent over the long term. This lower employment growth is not accompanied by a reduction in capital expenditures and hence is unlikely to be due to lower investment opportunities. Consistent with a disciplining effect of

CDS we find that firms with CDS are more likely to engage in proactive layoffs that involve restructuring to achieve cost efficiencies. Employment in firms with CDS trading is also more sensitive to firm growth especially in downturns. Reduction in the employment growth after CDS initiation increases labor productivity and total factor productivity. We are one of the few paper that study the disciplining effect of CDS and also among the first to examine its effect on firm's employment.

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**Table 1: Time Trend in CDS Initiation**

The table reports the year of CDS initiation in the sample. The data is from Markit. Number of Non-CDS firms are unique firms in that year in Compustat that did not have any CDS trading over the sample period.

| Year | Number of CDS Initiation | Total number of Firms with CDS Trading | Number of Non-CDS firms |
|---|---|---|---|
| 2001 | 236 | 236 | 3114 |
| 2002 | 103 | 339 | 3346 |
| 2003 | 118 | 457 | 3202 |
| 2004 | 107 | 564 | 3001 |
| 2005 | 62 | 626 | 2787 |
| 2006 | 36 | 662 | 2741 |
| 2007 | 61 | 723 | 2581 |
| 2008 | 20 | 743 | 2462 |
| 2009 | 3 | 746 | 2544 |
| 2010 | 6 | 752 | 2416 |
| 2011 | 15 | 767 | 2302 |
| 2012 | 15 | 782 | 2296 |
| 2013 | 6 | 788 | 2269 |
| 2014 | 8 | 796 | 2233 |
| 2015 | 13 | 809 | 2169 |
| 2016 | 4 | 813 | 2192 |
| 2017 | 16 | 829 | 2221 |
| 2018 | 11 | 840 | 2182 |
| 2019 | 8 | 848 | 2159 |
| 2020 | 7 | 855 | 2213 |
| 2021 | 0 | 855 | 2219 |
| 2022 | 0 | 855 | 2232 |

## Table 2: Summary Statistics for the Full Sample

The data is from 1995 to 2022 for all firms that meet the selection criteria. *Change in Log Employment* is the change in the log of the number of employees from prior year. *Hire Rate* is change in the number of employees divided by the average number of employees in the prior year and current year. *Layoffs* is a dummy that takes the value of one if the firm announced a layoff in the year. *Return on Assets (ROA)* is net income divided by total assets. *Leverage* is the ratio of long term debt to total assets. *Tangibility* is the ratio of fixed assets to total assets. *Stock Volatility* is the annual volatility of daily stock returns. *Market to Book* is the market to book value of equity. *Sales Growth* is the change in sales from prior year scaled by prior year's sales. Total number of observations were 80,914.

| | **Mean** | **Standard deviation** | **25th percentile** | **Median** | **75th percentile** |
|---|---|---|---|---|---|
| Change in Log employment | 0.0337 | 0.3105 | -0.0513 | 0.0247 | 0.1178 |
| Hire Rate | 0.0333 | 0.2639 | -0.0513 | 0.0247 | 0.1176 |
| Layoffs | 0.0098 | 0.0983 | 0 | 0 | 0 |
| Log of Total Assets | 6.1953 | 2.2148 | 4.5349 | 6.1276 | 7.7330 |
| Return on Assets | -0.0382 | 0.2612 | -0.0439 | 0.0306 | 0.0746 |
| Leverage | 0.1767 | 0.1866 | 0.0034 | 0.1302 | 0.2893 |
| Tangibility | 0.5310 | 0.4371 | 0.1984 | 0.4041 | 0.7618 |
| Stock Volatility | 0.7945 | 0.7144 | 0.3230 | 0.5010 | 0.9667 |
| Market to Book | 10.7610 | 17.9909 | 1.4528 | 2.6306 | 7.5599 |
| Sales Growth | 0.8384 | 6.9824 | -0.0428 | 0.0658 | 0.1959 |

## Table 3. Employment Change after CDS Initiation in the Full Sample

The table reports results of an OLS regression in a sample of all firms that meet the data requirements from 1995 to 2022 on Compustat. The dependent variable is specified in the first row and is *Change in Log Employment* (Panel A), *Hire Rate* (Panel B) or CAPX/PPE. *Hire Rate* is the change in employment scaled by the average number of employees in the year of and the prior year. CAPX is capital expenditures and PPE is lagged property plant and equipment. *CDS Trading* is a dummy that takes the value of one for years when the firm has a CDS traded. ROA is return on assets, Leverage is the ratio of long term debt to total assets. Tangibility is the ratio of fixed assets to total assets. Stock volatility is the annual volatility of daily stock returns. Market to Book is the market to book value of equity. Sales growth is the change in sales from prior year scaled by prior year's sales. All control variables are lagged and have been winsorized at the 1 and 99$^{th}$ percentile. Sales Growth and Market to Book have been divided by 1000 for scaling. Fixed effects are included and are specified at the end of the table. Robust standard errors are reported in parenthesis below. $^{*}$.$^{**}$.$^{***}$ denote significance at the 10%, 5% and 1% level.

| | **Panel A: Change in Log Employment** | | | **Panel B: Hire Rate** | | | **CAPX/ PPE** |
|---|---|---|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3** | **Model 1** | **Model 2** | **Model 3** | **Model 2** |
| CDS Trading | -0.0306$^{***}$ | -0.0244$^{***}$ | -0.0200$^{***}$ | -0.0298$^{***}$ | -0.0243$^{***}$ | -0.0209$^{***}$ | -1.2784 |
| | (0.0059) | (0.0057) | (0.0030) | (0.0051) | (0.0050) | (0.0027) | (1.7027) |
| Log Assets | | -0.0948$^{***}$ | -0.0048$^{***}$ | | -0.0854$^{***}$ | -0.0043$^{***}$ | -2.3647$^{**}$ |
| | | (0.0036) | (0.0007) | | (0.0027) | (0.0006) | (0.9887) |
| ROA | | 0.1713$^{***}$ | 0.1235$^{***}$ | | 0.1680$^{***}$ | 0.1221$^{***}$ | 8.6250 |
| | | (0.0133) | (0.0098) | | (0.0097) | (0.0073) | (5.5506) |
| Leverage | | -0.0647$^{***}$ | -0.0283$^{***}$ | | -0.0549$^{***}$ | -0.0214$^{***}$ | 1.1759 |
| | | (0.0131) | (0.0084) | | (0.0102) | (0.0065) | (6.3304) |
| Tangibility | | -0.0891$^{***}$ | -0.0377$^{***}$ | | -0.0832$^{***}$ | -0.0373$^{***}$ | -9.3182$^{**}$ |
| | | (0.0101) | (0.0039) | | (0.0079) | (0.0031) | (3.6692) |
| Stock Volatility | | -0.0048 | -0.0070$^{**}$ | | -0.0038 | -0.0072$^{***}$ | -4.0547 |
| | | (0.0042) | (0.0031) | | (0.0036) | (0.0027) | (2.7576) |
| Market to Book | | 0.0288 | 0.1321 | | 0.0478 | 0.2084* | 63.3537 |
| | | (0.1686) | (0.1321) | | (0.1388) | (0.1104) | (45.5223) |
| Sales Growth | | -0.0216 | 0.0089 | | -0.0179 | 0.0090 | -1.7966 |
| | | (0.0189) | (0.0299) | | (0.0179) | (0.0292) | (1.8716) |
| Constant | 0.1180$^{***}$ | 0.6733$^{***}$ | 0.1352$^{***}$ | 0.1157$^{***}$ | 0.6166$^{***}$ | 0.1290$^{***}$ | 20.0447$^{***}$ |
| | (0.0059) | (0.0221) | (0.0075) | (0.0050) | (0.0168) | (0.0062) | (6.3670) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | No | Yes | Yes | No | Yes |
| Industry FE | No | No | Yes | No | No | Yes | No |
| Num. Obs. | 80,891 | 80,891 | 80,891 | 80,914 | 80,914 | 80,914 | 83,277 |
| Adjusted $R^2$ | 0.1185 | 0.1487 | 0.0276 | 0.1318 | 0.1673 | 0.0365 | 0.1356 |

## Table 4. Layoffs and CDS Initiation in the Full Sample

The table reports results in a sample of all firms that meet the data requirements from 1995 to 2022 on Compustat. The dependent variable is *Layoffs* a dummy that is equal to one if the firm announces a layoff in the year. Model 1 and 2 (3) report the results of an OLS (Logit) estimation. *CDS Trading* is a dummy that takes the value of one for years when the firm has a CDS traded. ROA is net income over assets. Leverage is the ratio of long term debt to total assets. Tangibility is the ratio of fixed assets to total assets. Stock volatility is the volatility of annual stock returns. Market to Book is the market to book value of equity. Sales growth is the change in sales from prior year scaled by prior year's sales. All control variables are lagged and have been winsorized at the 1 and 99$^{th}$ percentile. Sales Growth and Market to Book have been divided by 1000 for scaling. Fixed effects are included and are specified at the end of the table. Robust standard errors are reported in parenthesis below. $^{*}$.$^{**}$.$^{***}$ denote significance at the 10%, 5% and 1% level.

| | **Model 1: OLS** | **Model 2: OLS** | **Model 3: Logit** |
|---|---|---|---|
| CDS Trading | 0.0120$^{***}$ | 0.0195$^{***}$ | 0.4674$^{***}$ |
| | (0.0036) | (0.0021) | (0.1005) |
| Log Assets | 0.0068$^{***}$ | 0.0061$^{***}$ | 0.6219$^{***}$ |
| | (0.0008) | (0.0003) | (0.0261) |
| ROA | -0.0085$^{***}$ | -0.0153$^{***}$ | -0.8009$^{***}$ |
| | (0.0025) | (0.0018) | (0.1184) |
| Leverage | 0.0026 | -0.0083$^{***}$ | 0.1045 |
| | (0.0034) | (0.0021) | (0.2411) |
| Tangibility | 0.0027 | 0.0000 | -0.0367 |
| | (0.0018) | (0.0009) | (0.1104) |
| Stock Volatility | 0.0005 | 0.0011 | 0.0168 |
| | (0.0012) | (0.0010) | (0.0956) |
| Market to Book | -0.0626 | -0.0556 | -11.4433$^{**}$ |
| | (0.0522) | (0.0327) | (5.0413) |
| Sales Growth | 0.0024 | 0.0015 | 0.1968 |
| | (0.0059) | (0.0057) | (0.18530 |
| Constant | -0.0371$^{***}$ | -0.0299$^{***}$ | -11.5406$^{***}$ |
| | (0.0043) | (0.0016) | (0.6343) |
| Year fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | No | No |
| Industry fixed effects | No | Yes | Yes |
| Number of Observations | 83,310 | 83,310 | 64,211 |
| Adjusted $R^2$ (Psuedo $R^2$) | 0.0355 | 0.0347 | 0.2330 |

## Table 5: Difference between CDS firms and Matched Firms

The table reports mean values of firm characteristics for CDS firms and Non CDS firms in the year prior to CDS initiation. The table reports mean values of the variables for CDS firms and the matched Non CDS firms and the t statistics for the difference between the two. *Rated* is a binary variable with a value of one when a company has a debt rating from Standard & Poor's and zero otherwise. *Investment grade* is a dummy variable with a value of one when a company's credit rating from Standard & Poor's is higher than BB+, and zero otherwise. Ln(Asset) is the log of the book value of a firm's asset. ROA is net income scaled by total assets, Leverage is the ratio of long term debt to assets, Tangibility is the ratio of net property, plant, and equipment to the total assets. Market to book is the ratio of the market value of assets to the book value of assets. Sales growth is the change in sales scaled by lagged sales. Volatility is the annual volatility of a firm's equity. Propensity Score is the estimated likelihood of CDS initiation based on the Probit Model. Employment is the number of employees. *Hire Rate* is the change in the number of employees scaled by the average number of employees in the year of and prior year. In all models we match with replacement in the year prior to initiation. In Panel A, we impose the restriction that the matched Non CDS firm is in the same two digit SIC. In Panel B, we impose the restriction that the matched Non CDS firm be from the same industry and its propensity score be within 10% of the value for the CDS firm. In Panel C, we select upto the top three best matched Non CDS firms in the same industry. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels

| | **Panel A: Within Industry** | | | **Panel B: Within Industry and 10%** | | | **Panel C: One to Many Match** | | |
|---|---|---|---|---|---|---|---|---|---|
| | CDS firms | Non-CDS firms | P Value | CDS firms | Non-CDS firms | P Value | CDS firms | Non-CDS firms | P Value |
| Rated | 0.9225 | 0.9006 | 0.1534 | 0.8846 | 0.8932 | 0.7692 | 0.9225 | 0.8955 | 0.0391** |
| Investment grade | 0.3436 | 0.2807 | 0.0121** | 0.2607 | 0.2521 | 0.8328 | 0.3436 | 0.2462 | 0.0000*** |
| Log assets | 8.3497 | 7.7346 | 0.0000*** | 7.7103 | 7.6417 | 0.5586 | 8.3497 | 7.5654 | 0.0000*** |
| Profit | 0.0366 | 0.0118 | 0.0005*** | 0.0242 | 0.0306 | 0.4505 | 0.0366 | 0.0144 | 0.0010*** |
| Leverage | 0.2717 | 0.2872 | 0.1273 | 0.2782 | 0.2403 | 0.0239** | 0.2717 | 0.2768 | 0.5301 |
| Tangibility | 0.6013 | 0.5887 | 0.5787 | 0.5959 | 0.5956 | 0.9935 | 0.6013 | 0.5845 | 0.3551 |
| Market to book | 4.9672 | 5.9270 | 0.5432 | 5.5824 | 6.0305 | 0.5888 | 4.9672 | 5.4415 | 0.2469 |
| Sales growth | 0.1460 | 0.0874 | 0.0031*** | 0.1464 | 0.0949 | 0.0675* | 0.1460 | 0.1479 | 0.9556 |
| Annual volatility | 0.4749 | 0.5883 | 0.0000*** | 0.5187 | 0.5589 | 0.3587 | 0.4749 | 0.5916 | 0.0000*** |
| Propensity score | 0.1162 | 0.1077 | 0.8584 | 0.0806 | 0.0798 | 0.9225 | 0.1162 | 0.1259 | 0.8899 |
| | | | | | | | | | |
| Log employment | 2.5811 | 1.8622 | 0.0000*** | 1.8385 | 1.7103 | 0.3670 | 2.5811 | 1.7958 | 0.0000*** |
| Change in Log employment | 0.0597 | 0.0460 | 0.3383 | 0.0739 | 0.0308 | 0.1189 | 0.0597 | 0.0426 | 0.2352 |
| Hire Rate | 0.0558 | 0.0430 | 0.3149 | 0.0678 | 0.0250 | 0.0649* | 0.0558 | 0.0362 | 0.7630 |
| Layoff Dummy | 0.0365 | 0.0336 | 0.7691 | 0.0256 | 0.0427 | 0.3099 | 0.0365 | 0.0318 | 0.5432 |
| Number of firms | 684 | 444 | | 234 | 216 | | 684 | 1158 | |

## Table 6: Employment Changes Post CDS Initiation: Propensity Matched Sample

The sample consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The dependent variables are specified in column headings and are *Change in Log Employment*, *Hire Rate*, *Layoff Dummy* or *CAPX/ PPE*. The *Hire Rate* is change in employment scaled by the average employment in the year of and prior year. *Layoffs* takes the value of one if the firm announces a layoff in the year. Model 3 reports the result of a Logit estimation. *CDS Trading* takes the value of one if the firm has CDS traded on its debt in the year. The definition of control variables is provided in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. Year, firm and industry fixed effects included in the specifications are specified at the bottom of the table. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

| | **Change in Log Employment** | **Hire Rate** | **Layoffs** | **CAPX/ PPE** |
|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3 (Logit)** | **Model 4** |
| CDS Trading | -0.0166** | -0.0170*** | 0.4145*** | -0.2403 |
| | (0.0071) | (0.0063) | (0.1412) | (0.5462) |
| Log Assets | -0.0834*** | -0.0771*** | 0.7002*** | -0.3963*** |
| | (0.0055) | (0.0045) | (0.0443) | (0.1284) |
| ROA | 0.3861*** | 0.3684*** | -2.0052*** | -0.6712 |
| | (0.0356) | (0.0309) | (0.6187) | (1.5960) |
| Leverage | -0.0423* | -0.0377* | 0.1309 | -0.3048 |
| | (0.0229) | (0.0198) | (0.4368) | (0.5918) |
| Tangibility | -0.0642*** | -0.0549*** | -0.0589 | -0.4784 |
| | (0.0162) | (0.0125) | (0.1714) | (0.3360) |
| Stock Volatility | -0.0334*** | -0.0341*** | -0.4795** | 0.1038 |
| | (0.0098) | (0.0089) | (0.2201) | (0.3659) |
| Market to Book | -0.3358 | -0.2258 | -4.4983 | 2.4460 |
| | (0.2785) | (0.2448) | (6.5568) | (3.3971) |
| Sales Growth | 0.0406 | 0.0542 | -440.6320 | -0.0680 |
| | (0.0507) | (0.0410) | (374.0505) | (0.0861) |
| Constant | 0.7512*** | 0.7006*** | -13.5694*** | 4.0835*** |
| | (0.0475) | (0.0389) | (1.2278) | (0.9063) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Firm Fixed Effects | Yes | Yes | No | Yes |
| Industry Fixed Effects | No | No | Yes | No |
| Num. of Observations | 16,767 | 16,769 | 12,978 | 17,003 |
| Adjusted (Psuedo) $R^2$ | 0.1226 | 0.1449 | 0.2198 | 0.1090 |

## Table 7: 2SLS Estimation the effect of CDS trading

The table reports the first and second stage of 2SLS estimation that instruments for the likelihood of CDS Trading. The sample consists of all firms that meet the data requirements from 1995 to 2022 on Compustat. The dependent variable in the first stage is *CDS Trading*. *CDS Trading* is a dummy that takes the value of one for years when the firm has a CDS traded. The dependent variable for the Second stage vary and are listed in column heading. *Change in Log Employment* is the change in log employment, *Hire Rate* is the change in employment scaled by the average number of employees in the year of and the prior year, *Layoffs* takes the value of one if the firm announces a layoff in the year and *CAPX/ PPE* is the capital expenditures in the year scaled by PPE. Control variables included are ROA is return on assets, Leverage is the ratio of long term debt to total assets. Tangibility is the ratio of fixed assets to total assets. Market to Book is the market to book value of equity. Sales growth is the change in sales from prior year scaled by prior year's sales. All control variables are lagged and have been winsorized at the 1 and 99$^{th}$ percentile. Sales Growth and Market to Book have been divided by 1000 for scaling. Fixed effects are included and are specified at the end of the table. Robust standard errors are reported in parenthesis below. $^{*}$.$^{**}$.$^{***}$ denote significance at the 10%, 5% and 1% level.

| | **First Stage** | **Second Stage** | | | |
|---|---|---|---|---|---|
| **Dependent Variable** | **CDS Trading** | **Change in Log Employ** | **Hire Rate** | **Layoffs (OLS)** | **CAPX/ PPE** |
| | **Model 1** | **Model 3** | **Model 2** | **Model 5** | **Model 4** |
| Instrumented CDS Trading | | -.019$^{***}$ | -0.017$^{***}$ | 0.032$^{***}$ | 5.562$^{*}$ |
| | | (0.007) | (0.006) | (0.005) | (3.193) |
| Log Assets | 0.793$^{***}$ | -0.009$^{***}$ | -0.009$^{***}$ | 0.009$^{***}$ | -2.062 |
| | (0.013) | (0.001) | (0.001) | (0.001) | (1.463) |
| ROA | -0.471$^{***}$ | 0.287$^{***}$ | 0.273$^{***}$ | -0.025$^{***}$ | 4.836$^{*}$ |
| | (0.140) | (0.02) | (0.018) | (0.006) | (2.702) |
| Leverage | 1.191$^{***}$ | -.020$^{*}$ | -0.015$^{*}$ | -0.017$^{***}$ | -2.352 |
| | (0.078) | (0.012) | (0.009) | (0.004) | (1.924) |
| Tangibility | 0.278$^{***}$ | -0.0300 | -0.028$^{***}$ | -0.002 | -7.989 |
| | (0.036) | (0.005) | (0.004) | (0.002) | (7.239) |
| Stock Volatility | -1.266$^{***}$ | -.0160 | -0.017$^{***}$ | 0.01$^{***}$ | 0.336 |
| | (0.055) | (0.005) | (0.004) | (0.002) | (0.890) |
| Market to Book | -10.800$^{***}$ | 0.5960 | 0.773$^{***}$ | -0.317$^{***}$ | 71.988 |
| | (1.898) | (0.181) | (0.165) | (0.082) | (64.822) |
| Sales Growth | 0.330$^{***}$ | 0.001 | 0.000 | -.004$^{***}$ | -0.641 |
| | (0.077) | (0.028) | (0.027) | (0.001) | (0.538) |
| Bank FX | 3.514$^{***}$ | | | | |
| | (0.697) | | | | |
| Number of Observations | 34,169 | 33,617 | 33,629 | 34,169 | 34,161 |
| Industry FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |

## Table 8: Firm Characteristics and CDS Effect on Employment Growth

The sample consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The dependent variables are specified in column headings. The *Hire Rate* is change in employment scaled by the average employment in the year of and prior year. The dependent variable in Model 3 is *Layoffs* a dummy that takes the value of one if the firm announces a layoff in the year. The dependent variable in Model 4 was the ratio of CAPX to lagged PPE. The control variables included but not tabulated are Constant, Log (Assets), ROA, Leverage, Tangibility, Stock Volatility, Market to Book and Sales Growth. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. We include year, firm and industry fixed effects in different specifications that are specified at the bottom of the table. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

### Panel A: Credit Rating

Investment Grade (High Yield) dummy takes the value of one if the firms debt was (not) rated investment grade in the prior year.

| | **Change in Log Employ** | **Hire Rate** | **Layoffs (OLS)** | **CAPX/ PPE** |
|---|---|---|---|---|
| CDS Trading x Investment Grade | 0.0114 | 0.0090 | 0.0051 | -0.6911 |
| | (0.0079) | (0.0072) | (0.0044) | (0.5790) |
| CDS Trading x High Yield | -0.0338*** | -0.0330*** | 0.0139*** | 0.0269 |
| | (0.0086) | (0.0075) | (0.0037) | (0.1595) |
| Number of Observations | 16,940 | 16,942 | 17,184 | 17,184 |
| Year, Firm, Industry Fixed Effects | Yes, Yes, No | Yes, Yes, No | Yes, No, Yes | Yes, Yes, No |
| Adjusted (Psuedo) $R^2$ | 0.1244 | 0.1467 | 0.0712 | 0.1098 |

### Panel B: Short vs. Long Term Effect

*CDS Trading – Short Term* takes the value of one if the firm year is first or second year since the initiation of CDS trading. *CDS Trading – Long Term* takes the value of one if the firm year is 3 or more years since the initiation of CDS trading.

| | **Change in Log Employment** | **Hire Rate** | **Layoffs (Logit)** | **CAPX/ PPE** |
|---|---|---|---|---|
| CDS Trading – Short Term | -0.0066 | -0.0079 | 0.3186* | -0.2765 |
| | (0.0074) | (0.0068) | (0.1869) | (0.1829) |
| CDS Trading – Long Term | -0.0235*** | -0.0232*** | 0.4386*** | -0.2153 |
| | (0.0081) | (0.0072) | (0.1675) | (0.1968) |
| Num. of Observations | 16,767 | 16,769 | 12,978 | 17003 |
| Year, Firm, Industry Fixed Effects | Yes, Yes, No | Yes, Yes, No | Yes, No, Yes | Yes, Yes, No |
| Adjusted (Psuedo) $R^2$ | 0.1228 | 0.1451 | 0.2200 | 0.1090 |

**Panel C: Unionization**

High (Low) Union dummy takes the value of one if the firm's industry had above median union membership for the prior year.

| | **Change in Log Employ** | **Hire Rate** | **Layoff Dummy (OLS)** | **CAPX/ PPE** |
|---|---|---|---|---|
| CDS Trading x High Union | -0.0202** | -0.0201*** | 0.0163*** | -0.2203 |
| | (0.0087) | (0.0075) | (0.0043) | (0.2284) |
| CDS Trading x Low Union | -0.0212*** | -0.0225*** | 0.0034 | -0.2488 |
| | (0.0078) | (0.007) | (0.004) | (0.1829) |
| Number of Observations | 16,013 | 16,015 | 16,249 | 16,249 |
| Adjusted $R^2$ | 0.1800 | 0.2008 | 0.0747 | 0.1641 |
| Year, Firm, Industry Fixed Effects | Yes, Yes, No | Yes, Yes, No | Yes, No, Yes | Yes, Yes, No |

## Table 9. Nature of Layoffs

The sample in Panel A consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The sample in Panel B consists of all firms that meet the data requirements from 1995 to 2022 on Compustat. Results are from logit estimations where the dependent variable captures the nature of the layoff announced by the firm. The dependent variable in Model 1(2)[3] takes the value of one if the motivation for the layoff was *Demand* (*Efficiency*) [*Efficiency and Restructuring*] related. *CDS Trading* is a dummy that takes the value of one for years when the firm has a CDS traded not including the initiation year. The estimation included control variables that are not reported for brevity. The control variables included but not tabulated for brevity are Log (Assets), ROA, Leverage, Tangibility, Stock Volatility, Market to Book and Sales Growth. The definition of control variables is in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. Fixed effects are included and are specified at the end of the table. Robust standard errors are reported in parenthesis below. $^{*}$.$^{**}$.$^{***}$ denote significance at the 10%, 5% and 1% level.

| | **Panel A: Propensity Matched Sample** | | |
|---|---|---|---|
| | **Model 1: Demand Layoffs** | **Model 2: Efficiency Layoffs** | **Model 3: Efficiency & Restructuring** |
| CDS Trading | 0.56 | 0.5806$^{**}$ | 0.5317$^{***}$ |
| | (0.3726) | (0.2854) | (0.1975) |
| Year, Ind, Firm FE | Yes, Yes, No | Yes, Yes, No | Yes, Yes, No |
| Num. of Observations | 7,300 | 10,125 | 11,248 |
| Psuedo $R^2$ | 0.28 | 0.16 | 0.17 |

| | **Panel B: Full Sample** | | |
|---|---|---|---|
| | **Model 1: Demand Layoffs** | **Model 2: Efficiency Layoffs** | **Model 3: Efficiency & Restructuring** |
| CDS Trading | 0.2571 | 0.5781$^{***}$ | 0.4527$^{***}$ |
| | (0.2778) | (0.1844) | (0.1378) |
| Year, Ind, Firm FE | Yes, Yes, No | Yes, Yes, No | Yes, Yes, No |
| Num. of Observations | 46,972 | 56,153 | 61,488 |
| Psuedo $R^2$ | 0.2564 | 0.1729 | 0.198 |

## Table 10: Sensitivity to Firm Growth

The sample consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The dependent variables are specified in column headings. The model for *Layoff* Dummy is an OLS model. *Sales Growth* is he average sales growth over the past three years. *LDummy (HDummy)* is a dummy that takes the value of one if *Sales Growth* is (not) in the bottom 33% of all firms in the industry in that year. The control variables included but not tabulated for brevity are Log (Assets), ROA, Leverage, Tangibility, Stock Volatility, and Market to Book. Sales growth was omitted for this estimation. The definition of control variables is in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. We include fixed effects that are specified in the table. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels. Layoff is a logit model with only year effects.

| | **Panel A: Specification 1** | | | | **Panel B: Specification 2** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Hire Rate** | **Change in Log Emp.** | **Layoff Dummy** | **CAPX/ PPE** | **Hire Rate** | **Change in Log Emp.** | **Layoff Dummy** | **CAPX/ PPE** |
| CDS Trading | -0.0204*** | -0.0199*** | 0.0093 | -0.0077 | -0.0191*** | -0.0185** | 0.0097 | -0.0081 |
| | (0.0069) | (0.0077) | (0.0059) | (0.0296) | (0.0069) | (0.0077) | (0.0060) | (0.0220) |
| Sales growth | 0.0521*** | 0.0523*** | -0.0085 | 0.0562*** | 0.0518*** | 0.0520*** | -0.0086 | 0.0563*** |
| | (0.0119) | (0.0135) | (0.0060) | (0.0062) | (0.0119) | (0.0135) | (0.0060) | (0.0615) |
| CDS Trading x Sales Growth | 0.0430* | 0.0424* | 0.0174 | 0.0268** | | | | |
| | (0.0240) | (0.0251) | (0.0186) | (0.0102) | | | | |
| CDS Trading x Sales growth x Low Dummy | | | | | 0.1556** | 0.1559** | 0.0520 | -0.0083 |
| | | | | | (0.0697) | (0.0748) | (0.0509) | (0.0247) |
| CDS Trading x Sales growth x High Dummy | | | | | 0.0320 | 0.0314 | 0.0140 | 0.0302*** |
| | | | | | (0.0247) | (0.0268) | (0.0199) | (0.0107) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Num. Obs. | 14,137 | 14,137 | 14,258 | 14,258 | 14,137 | 14,137 | 14,258 | 14,258 |
| Adjusted R squared | 0.1328 | 0.1202 | 0.1806 | 0.4528 | 0.1330 | 0.1203 | 0.1806 | 0.4255 |

## Table 11: Impact of CDS Trading on Firm Productivity

The sample in Panel A consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The sample in Panel B consists of all firms that meet the data requirements from 1995 to 2022 on Compustat. The dependent variables are listed on column heads. *Capital Intensity* is the ratio of average PPE to average number of employees. Average PPE (number of employees) is the average of the beginning and end of year values. *Labor productivity* is the ratio of sales to average number of employees. *TFP* or total factor productivity is the residual from the regression Log Sales = Log Avg. Emp + Log Avg PPE + Log Avg. Inventory. TFP (ACF) is total factor productivity after the ACF correction for endogeneity. *CDS Trading* is a dummy that takes the value of one for years when the firm has a CDS traded not including the initiation year. The control variables included but not tabulated for brevity are Log (Assets), ROA, Leverage, Tangibility, Stock Volatility, Market to Book and Sales Growth. The definition of control variables is in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. Fixed effects are included and are specified at the end of the table. Robust standard errors are reported in parenthesis below. *.**.*** denote significance at the 10%, 5% and 1% level.

**Panel A: Matched Sample**

| | Capital Intensity | Labor Productivity | Sales/ Assets | TFP | TFP (ACF) |
|---|---|---|---|---|---|
| CDS Trading | 0.1802*** | 0.0323** | 0.0186** | 0.0250** | 0.2361*** |
| | (0.0450) | (0.0129) | (0.0078) | (0.0102) | (0.0813) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes |
| Num. Observations | 17,003 | 17,003 | 17,003 | 16,336 | 15,014 |
| Adjusted $R^2$ | 0.7433 | 0.6864 | 0.8891 | 0.8170 | 0.7150 |

**Panel B: Full Sample**

| | Capital Intensity | Labor Productivity | Sales/ Assets | TFP | TFP (ACF) |
|---|---|---|---|---|---|
| CDS Trading | 0.3463*** | 0.0805*** | 0.0095 | 0.0570*** | 0.0694 |
| | (0.0353) | (0.0105) | (0.0072) | (0.0090) | (0.0598) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes |
| Num. Observations | 83,310 | 83,310 | 83,288 | 79,138 | 74,372 |
| Adjusted $R^2$ | 0.6962 | 0.6007 | 0.8343 | 0.7761 | 0.6555 |

## Table 12: Robustness Tests with other Propensity Matches

The sample consists of CDS firms and propensity score matched firms. The dependent variables specified in column headings are *Change in Log Employment*, *Hire Rate* or *Layoff Dummy*. The *Hire Rate* is change in employment scaled by the average employment in the year of and prior year. The *Layoff Dummy* takes the value of one if the firm announces a layoff in the year. Model3 reports the result of a Logit estimation. The dependent variable in Model is the ratio of capital expenditure to total property plant and equipment. *CDS Trading* takes the value of one if the firm has CDS traded on its debt in the year. The definition of control variables can be seen in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. We include year and firm fixed effects that are specified in the table in all models except Model 4.. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

### Panel A: Within Industry and 10% Propensity Match

CDS firms were matched to Non CDS firms in the same two digit SIC with a propensity for CDS initiation within 10% of the reference firm in the year prior to initiation.

| | Change in Log Employment | Hire Rate | Layoffs | CAPX/PPE |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 (Logit) | Model 4 |
| CDS Trading | -0.0188* | -0.0191** | 0.8176*** | -0.0076 |
| | (0.0110) | (0.0097) | (0.2307) | (0.0056) |
| Controls and Year FE | Yes | Yes | Yes | Yes |
| Firm fixed Effects | Yes | Yes | No | Yes |
| Industry Fixed Effects | No | No | Yes | No |
| Num. of Obs. | 6,603 | 6,603 | 4,215 | 6652 |
| Adjusted R squared | 0.1540 | 0.1757 | 0.1653 | 0.3448 |

### Panel B: Within Industry, One to Many Matches

CDS firms were matched to upto three Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation to the reference firm in the year prior to initiation.

| | Change in Log Employment | Hire Rate | Layoffs | CAPX/ PPE |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 (Logit) | Model 4 |
| CDS Trading | -0.0221*** | -0.0231*** | 0.4755*** | 0.0029 |
| | (0.0068) | (0.0058) | (0.1271) | (0.0036) |
| Controls and Year FE | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | No | Yes |
| Industry Fixed Effects | No | No | Yes | No |
| Num. of Obs. | 22,083 | 22,085 | 17,217 | 22,201 |
| Adjusted $R^2$ (Pseudo $R^2$) | 0.0955 | 0.1288 | 0.2225 | 0.3506 |

## Table 13: Other Robustness Analysis

The sample consists of CDS firms and propensity score matched firms. CDS firms were matched to Non CDS firms in the same two digit SIC with the closest propensity for CDS initiation in the year prior to initiation. The dependent variables are specified in column headings and are *Change in Log Employment*, *Hire Rate* or *Layoff Dummy*. The *Hire Rate* is change in employment scaled by the average employment in the year of and prior year. The *Layoff Dummy* takes the value of one if the firm announces a layoff in the year. Model 3 reports the result of a Logit estimation. The dependent variable in Model 4 is the ratio of capital expenditures to total property plant and equipment. *CDS Trading* takes the value of one if the firm has CDS traded on its debt in the year. The table includes control variables that are not reported for brevity. The definition of control variables can be seen in Table 2. All control variables are lagged by one year and windsorized at the 1st and 99th percentile. We include year, firm and industry fixed effects in different specifications that are specified at the bottom of the table. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

### Panel A: Excluding the Financial Crisis

The estimation excludes the observations from year 2008 and 2009.

| | Change in Log Employment | Hire Rate | Layoffs | CAPX/ PPE |
|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3 (Logit)** | **Model 4** |
| CDS Trading | -0.0178** | -0.0185*** | 0.31** | -0.25 |
| | (0.0073) | (0.0065) | (0.1555) | (0.168) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Firm Fixed Effects | Yes | Yes | No | Yes |
| Industry Fixed Effects | No | No | Yes | No |
| Num. of Observations | 15,430 | 15,432 | 11,472 | 15,647 |
| Adjusted R squared | 0.11 | 0.14 | 0.22 | 0.12 |

### Panel B: Excluding Initiation in Jan 2001

The estimation excludes CDS firms with initiation in Jan 2001 in the Markit dataset.

| | Change in Log Employment | Hire Rate | Layoffs | CAPX/ PPE |
|---|---|---|---|---|
| | **Model 1** | **Model 2** | **Model 3 (Logit)** | **Model 4** |
| CDS Trading | -0.0145* | -0.0148** | 0.302** | -0.342* |
| | (0.0074) | (0.0065) | (0.1527) | (0.1909) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Firm Fixed Effects | Yes | Yes | No | Yes |
| Industry Fixed Effects | No | No | Yes | No |
| Num. of Observations | 15,388 | 15,390 | 11,753 | 15,618 |
| Adjusted R squared | 0.12 | 0.15 | 0.19 | 0.11 |

## Appendix Table 1: Industry Distribution of CDS firms

The table reports the number of firms with CDS trading in two digit SIC with at least ten firms that have CDS trading over the sample period. The CDS initiation data is from Markit and is over the 2001 to 2020 time period. The number of Non-CDS firms is the number of unique firms in the two digit SIC on Compustat. All Other SIC has total number of CDS and Non CDS firms in two digits SIC with less than ten CDS firms over the sample period.

| Two Digit SIC | Industry Description | Num. of CDS firms | Num. of Non CDS firms |
|---|---|---|---|
| 13 | Oil And Gas Extraction | 61 | 351 |
| 15 | Building Construction General Contractors & Operative Builders | 18 | 39 |
| 20 | Food And Kindred Products | 39 | 197 |
| 26 | Paper And Allied Products | 26 | 70 |
| 27 | Printing, Publishing, And Allied Industries | 13 | 79 |
| 28 | Chemicals And Allied Products | 87 | 1173 |
| 29 | Petroleum Refining And Related Industries | 13 | 57 |
| 30 | Rubber And Miscellaneous Plastics Products | 10 | 81 |
| 33 | Primary Metal Industries | 19 | 123 |
| 34 | Fabricated Metal Products, Except Machinery & Transportation Equipment | 13 | 105 |
| 35 | Industrial And Commercial Machinery & Computer Equipment | 53 | 499 |
| 36 | Electronic And Other Electrical Equipment & Components, Except Computer Equipment | 43 | 762 |
| 37 | Transportation Equipment | 40 | 176 |
| 38 | Measuring And Controlling device | 26 | 649 |
| 45 | Transportation By Air | 11 | 57 |
| 48 | Communications | 61 | 348 |
| 50 | Wholesale Trade-durable Goods | 16 | 202 |
| 51 | Wholesale Trade-non-durable Goods | 13 | 128 |
| 53 | General Merchandise Stores | 16 | 33 |
| 58 | Eating And Drinking Places | 14 | 151 |
| 59 | Miscellaneous Retail | 16 | 200 |
| 73 | Business Services | 62 | 1669 |
| 79 | Amusement And Recreation Services | 21 | 100 |
| 80 | Health Services | 20 | 179 |
| | All Other SICs | 144 | 1701 |

## Appendix Table 2: Probit Estimation for the Propensity Match

The table reports results of a Probit model to predict the initiation of CDS trading. The dependent variable is *CDS Trading* that takes the value of one for years when the firm had CDS trading and zero otherwise. For CDS firms, we drop all the years after CDS initiation. Non CDS firms are included for the entire sample period. The sample includes all firms on Compustat that meet data requirements from 1995 to 2022. *Rated* is a dummy variable that takes the value of one if the firm has a S&P debt rating. *Investment Grade* is a dummy that takes the value of one if a firm credit rating is higher than BB+. ROA is return on assets and is the ratio of net income to total assets, Leverage is the ratio of long term debt to total assets. Tangibility is the ratio of fixed assets to total assets. Market to Book is the market to book value of equity. Sales growth is the change in sales from prior year scaled by prior year's sales. Stock Volatility is the annual volatility of daily stock returns. The estimation includes industry and year fixed effects All independent variables are lagged and have been winsorized at the 1 and 99$^{th}$ percentile. The standard errors are reported below.. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

| | **Coefficient** |
|---|---|
| Rated | 0.4992*** |
| | (0.1006) |
| Investment Grade | 0.0047 |
| | (0.0516) |
| Log Assets | 0.6085*** |
| | (0.0274) |
| ROA | -0.1985 |
| | (0.1292) |
| Leverage | 1.1848*** |
| | (0.1247) |
| Tangibility | 0.0513 |
| | (0.0670) |
| Market to Book | 3.2816 |
| | (4.4821) |
| Sales Growth | -72.6071 |
| | (58.5318) |
| Stock Volatility | -0.8982*** |
| | (0.1032) |
| Constant | -7.5965*** |
| | (0.4337) |
| Industry fixed effects | Yes |
| Year fixed effects | Yes |
| N | 50,104 |
| R2 (pseudo) | 0.4489 |

## Appendix Table 3: Firm Characteristics and Short-Term Reduction in Employment

The sample consists of CDS firms and propensity score matched firms. The dependent variables are specified in column headings and are *Change in Log Employment*, *Hire Rate*, *Layoff Dummy or CAPX/PPE*. The *Hire Rate* is the change in employment scaled by the average employment in the year of and prior year. The *Layoff Dummy* takes the value of one if the firm announces a layoff in the year. *CAPX/PPE* is capital expenditure divided by lagged Gross PPE. *CDS Short Term (Long Term)* takes the value of one if the firm has CDS traded on its debt in the year and the year is less than 3 (3 or more) years since initiation. *IG* (*HY*) consists of firms with an (no) investment grade credit rating in the year prior to CDS initiation. Control variables included but not tabulated are Log (Assets), ROA, Leverage, Tangibility, Stock Volatility, Market to Book and Sales Growth. All control variables are lagged and windsorized at the 1st and 99th percentile. Robust standard errors are reported below. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

| | **Change in Log Employment** | **Hire Rate** | **Layoff Dummy (OLS)** | **CAPX/ PPE** |
|---|---|---|---|---|
| CDS Trading Short Term x IG | 0.0047 | 0.0033 | 0.0123 | -0.8537 |
| | (0.0090) | (0.0083) | (0.0114) | (0.5826) |
| CDS Trading Short Term x HY | -.0167* | -.0172** | 0.0284*** | 0.0229 |
| | (0.0097) | (0.0087) | (0.0092) | (0.1877) |
| CDS Trading Long Term x IG | 0.0083 | 0.0070 | 0.0020 | -0.6792 |
| | (0.0086) | (0.0079) | (0.0045) | (0.6074) |
| CDS Trading Long Term x HY | -.0407*** | -0.0396*** | 0.0110*** | 0.0969 |
| | (0.0096) | (0.0084) | (0.0039) | (0.1588) |
| Observations | 16,499 | 16,499 | 16,700 | 16,700 |
| Adjusted $R^2$ | 0.1280 | 0.1447 | 0.0730 | 0.1107 |
| Year, Firm, Industry Fixed Effects | Yes, Yes, No | Yes, Yes, No | Yes, No, Yes | Yes, Yes, No |

**Appendix A: Classifying the nature of layoff announcements**

**Demand Layoffs**: Words used to classify a layoff as demand related are "decline in" , "losses in", "drop in", Poor performance, "demand", Economic downturn, Recession, Economy, Slump, Struggling, Decelerating , Ailing

**Efficiency Layoffs:** words used to classify a layoff as efficiency related are Cost, Efficiency, efficient, Skill assessment, Streamline, "employee under performance" or "worker underperformance", Unprofitable division, unprofitable plant, Strategic, Competitive,

**Structural Layoffs**: words used to classify a layoff as structure are Restructuring, restructure, restructured, M&A, merger, acquisition, acquired, Closes, close, Turnaround, Reorganize, reorganization, Retooling, Relocate

**Appendix B: Details for the construction of the instrument.**

For all firm in our full sample, we obtain data on the lead syndicate banks from Dealscan. From FISD we obtain data on the firm's bond underwriters. We then link the data to the Federal Reserve's Call Bank Holding Company data to get data on the notional value of foreign exchange derivatives positions not for trading. The instrument, *Bank FX*, is the average fraction of FX derivatives to total assets for all bank holding company that have served as lead bank or bond underwriters in the last five years.