Fight or Flight? The Response of Institutional Shareholders to Empty Creditors

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Abstract

We study the response of institutional investors to the presence of empty creditors. The initiation of credit default swap (CDS) contracts on referenced firms induces empty creditors. We document significant declines in total institutional shareholders' ownership and the total number of institutional investors after the inception of CDS trading. Moreover, we find that shareholders ownership becomes to be more concentrated after the inception of CDS trading. Further analysis shows that the stronger negotiation power of creditors and weak negotiation power of shareholders exacerbates the declines of total institutional ownership and the total number of institutional investors. Our findings shed light on the externality of empty creditor on shareholders' behavior.

Keywords: Empty creditor; Credit default swap; Institutional ownership;

1. Introduction

Corporate lenders possess both cash flow and contingent control rights. The ability to hedge to their cash flow risk using corporate debt insurance, such as credit default swaps (CDSs) equips creditors with an outside option that increases their bargaining power in debt restructuring negotiations relative to that of shareholders. By decoupling their cash flow and control rights, they, therefore, become "empty creditors" (Hu and Black, 2008), with stronger bargaining power in out-of-court restructurings. Being able to recover the face value of debt contracts through the triggering of insurance contracts, empty creditors may thus push firms into inefficient liquidation.

The presence of empty creditors, which arises because of the availability of CDS contracts, has attracted much interest in the popular press as well as in academic circles. Bolton and Oehmke (2011), for example illustrate theoretically how creditors' ability to purchase CDS insurance may lead to both positive and negative effects for firm value. While the outside option provided by the insurance contract may increase a firm's bankruptcy risk (Subrahmanyam, Tang, and Wang, 2014), the increased threat of liquidation may also reduce the likelihood of strategical default, thereby increasing the firm's leverage capacity (Saretto and Tookes, 2013). Colonnello, Efing, and Zucchi (2019) suggest that the overall effect on firm value is negative, and show that this depends on the relative bargaining power of creditors and shareholders.

Examples of powerful financiers nudging firms into bankruptcy are not new, and seem to occur ever more frequently, as widely discussed in the popular press. For example, when the tour operator Thomas Cook filed for bankruptcy, it was suggested that a restructuring deal could have been brokered for the distressed firm, had negotiations between shareholders, creditors, and regulators not been blocked by those hedge funds who stood to earn $250 million from the failure of the company, through the payouts of CDS contracts. Similarly, Blackstone's GSO Capital had offered favorable financing terms to distressed American homebuilder Hovnanian Enterprises Inc., in return for deliberately missing a debt payment.

In this paper, we study how institutional shareholders react to the introduction of CDS trading. While the existing literature recognizes that the overall welfare effects of the

rise of empty creditors depends on the relative bargaining power of creditors and shareholders, it also implicitly considers shareholders to be passive side players, who do not react to the increase in creditors' bargaining power obtained through the purchase of CDS insurance. If the overall welfare effect on firm value is negative, one may expect capital flight, whereby institutional investors reallocate their investments to firms less exposed to the empty creditor problem. Alternatively, they may decide to fight empty creditors by increasing their institutional equity ownership, and vote "with their feet" (Parrino, Sias, and Starks, 2003). This is likely to be especially important when institutional investors are active and have vested interests in the firm.

Moreover, to existing shareholders, new shareholders may enter by buying equity positions, with the goal of obtaining voting rights to oppose empty creditors. This could arise because CDS protection sellers, who face losses if CDS contracts get triggered following bankruptcy, want to avoid a firm's bankruptcy, as in the case of Norske Skog in 2016. However, new institutional equity investors may also have different incentives, as demonstrated by the distressed debt negotiations for Forest Oil in 2014, when CDS protection buyers purchases stocks to vote against a planned merger with Sabine Oil & Gas, a deal that would have avoided default.

Using CDS trading information in the United States during a period from 1997 to 2018, we document significant declines in total institutional shareholders' ownership and the total number of institutional shareholders after CDS introduction. We also find the mean of institutional shareholders' ownership significantly increases after the inception of CDS trading. These results survive in a battery of tests to address endogeneity concerns. This evidence suggests that institutional ownership becomes to be more concentrated in the presence of empty creditor.

To further understand institutional shareholders' motives in response to empty creditors, we examine the impact of creditors and shareholders' bargaining power on the relationship between CDS activities and the characteristics of institutional shareholders' ownership. Specifically, we first use the presence of bank loan to reflect creditors' bargaining powers. In contrast to other creditors, banks are the most sophisticated and have stronger bargaining power, especially when a firm is in financial distress. We find

that the negative effect of CDS introduction on aggregated institutional ownership and the total number of institutional investors are more pronounced when banks are one of creditors. It suggests that stronger creditors' bargaining power in financial distress enhances the negative impact of empty creditors on institutional shareholders. Then, we use the aggregated institutional shareholders' ownership to reflect shareholders' bargaining power. A higher shareholders' ownership suggests a stronger shareholders' bargaining power. We find that the negative effect of CDS introduction on institutional ownership and the total number of institutional shareholders is weakened when shareholders' bargaining power is strong.

This study contributes to the related literature from at least three aspects. First, our findings improve the understanding of how the rise of credit derivatives market and the associated emergence of activist investors in credit markets affects the ownership structure of publicly listed firms. Prior literature mostly focuses on examining the effect of credit derivatives on corporate default risk (literature), cash holdings(literature), corporate innovations(literature), etc. In this study, we shed light on the externality of credit derivatives on shareholders' ownership, especially the activist institutional investors.

Second, this study improves the understanding of the determinants of institutional ownership, the interactions between creditors and shareholders, and highlight that CDS trading has real effects on financial markets. In contrast to closely related prior literature that document the effect of corporate behaviour, such as CEO turnover (Parrino, Sias and Starks, 2003), and private right (Bartlett, 2015)on shareholders' ownership, we document credit derivative activities as a novel determinate of shareholders ownership. Considering the important role of institutional investors in the financial markets, our findings generate immediate implications for corporate managers to understand institutional investors' behaviour and manage financial risk.

Last, in light of the growing concerns raised by the U.S. Commodity Futures Trading Commission and the U.S. Securities and Exchange Commission about the rise of CDS activist investors, we believe that our findings will also be useful for regulators and policy makers around the world. One of the lessons learned by global regulators from the recent

global recession starting from 2008 is to enhance and complete the regulation on credit derivatives markets to maintain the stability of global financial system. Since the equity markets is the foundation of global financial system, , it is essential to understand the real effects of credit derivatives trading on shareholders' behaviour when policy makers monitor and regulate financial markets.

The rest of paper is organized as follows. Section 2 reviews the literature and develops hypotheses. Section 3 describe data. Section 4 examines the effects of credit derivatives trading on shareholders' ownership. Section 5 conducts further analysis to understand the mechanism. Section 6 concludes.

2. Literature review and hypotheses development

The onset of CDS trading may impact institutional ownership through two different channels: change in creditor rights and change in creditor monitoring. The theoretical literature has pointed out a number of beneficial and detrimental effects of CDS trading on shareholder value. As such, the predictions of CDS trading on institutional equity ownership are not clear ex-ante. This leads us to revisit the different channels more specifically.

First, the onset of CDS trading may enhance protected creditors' bargaining power in distressed debt negotiations relative to shareholders, because CDS insurance increases the creditors' outside options. This makes any threat of liquidation more credible (e.g. Bolton and Oehmke, 2011; Danis and Gamba, 2018). It has indeed been shown that the presence of intransigent creditors can lead to lower participation rate in distressed debt exchange offers (Danis, 2017), and more liquidation and higher bankruptcy risk in distressed firms (e.g. Subrahmanyam, Tang, and Wang, 2014). The increase of bankruptcy risk after the start of CDS trading also indicates a higher cost of debts in distressed firms (Ashcraft and Santos, 2009). Moreover, the initiation of CDS trading enhances creditors' negotiation power by providing insurance to their credit risk exposure, which consequently weakens shareholders' bargaining power, especially for distressed firms. Cohn, Gillan, and Hartzell (2016) show that an increase in shareholder control

benefits shareholders. Ceteris paribus, a decrease of shareholder control after the onset of CDS trading deteriorates shareholders' value. These negative consequences on the riskiness and valuation of a firm caused by empty creditors after the onset of CDS trading may incentivize shareholders to sell their equity shares of CDS-referenced firms, suggesting a lower institutional ownership after the introduction of CDS contracts. This might be especially true for those institutional investors who prefer prudent firms (Parrino et al., 2003).

In addition to the change in creditor control rights, the presence of CDS contracts may change creditors' incentives to monitor the firm, because they provide full coverage for the referenced bonds' losses in case of bankruptcy. If credit exposures of risky bonds (loans) are fully hedged, creditors may not be as vigilant in monitoring CDS-referenced firms following the onset of CDS trading, which could further increase shareholders' incentives to divest.

On the other hand, the introduction of CDS trading may provide an alternative channel to reveal firm-specific information. Equity price and CDS spreads are linked through firm fundamentals. The change in a firm's fundamental could be disseminated to investors through the fluctuation of either equity prices or CDS spreads. A number of studies provide indeed evidence that CDS premiums enhance price discovery and provide relevant firm-specific information (Acharya and Johnson, 2007; Zhang and Zhang, 2013; Kryzanowski et al., 2017; Liu, et al., 2019). Thus, it is conceivable that the improved relevation of firm-specific information after the inception of CDS trading would incentivize institutional investors to increase their equity ownership in CDS-referenced firms. Furthermore, the creditors who hold corporate bonds and corresponding CDS contracts retain all control rights, but transfer any credit risk to their counterparty of CDS contracts. This mechanism helps creditors to control credit risk of borrowers and develop new business, which increases the number of creditors who are willing to lend and reduce the number of loan covenants (Bolton and Oehmke, 2011; Shan, Tang, and Winton, 2019). Parlour and Winton (2013) use a theoretically model to show that CDS increases lending efficiency for high-quality borrowers. The larger lender base and greater lending efficiency facilitate referenced firms' debt financing. The relaxation of debt financing constraints after the inception of CDS trading suggests a positive influence on firm

valuation, which could motive institutional investors to increase the ownership of CDS-referenced firms.

According to these different channels, the impact of the introduction of CDS contracts on institutional ownership is ambiguous ex-ante. According to analysis above, we plan to empirically examine the impact of CDS trading on institutional ownership. Our objective is to develop additional hypotheses to tease out the specific channels through which we may observe an impact of CDS trading on institutional ownership.

H1: *The total institutional ownership declines and become more concentrated after the introduction of CDS contracts.*

H2: *The influence of CDS trading on institutional ownership are more pronounced in the firms with severe empty creditor problem.*

H3: *The influence of CDS trading on institutional ownership are more pronounced in the firms with strong bargaining power of creditors and weak bargaining power of shareholders.*

3. Data description

3.1 CDS trading

To compile a comprehensive dataset to identify CDS trading, we employ both CDS transaction data from CreditTrade and the GFI Group and CDS quotes from the Markit Group.[1] The actual CDS transactions reflect the CDS price, as agreed upon between counterparties, whereas CDS quotes show the binding prices from committed buyers and sellers. Tang and Yan (2017) provide a comprehensive analysis of CDS transactions. Due to the limited number of transactions in the CDS market, CDS quotes are used to provide complementary information about the focal firms. Hence, the transactions and quotes together provide a full picture of CDS activities and reveal information about the focal firms.

[1] Similar data are used by Subrahmanyam et al. (2014, 2017), Li and Tang (2016), Shan, Tang, and Winton (2019), and Shan, Tang, Yan, and Zhou (2021).

We focus on single-name CDS contracts in the United States. Specifically, CreditTrade covers the period from June 1996 to March 2006, the GFI Group covers the period from January 2002 to April 2009, and Markit covers the period from August 2001 to December 2018. After merging these three datasets, our composite dataset covers CDS activities from 1996 to 2018. The overlapping time periods allow us to validate the data quality for each source. In our baseline analysis, we use information about the inception of CDS trading or CDS quotes to assess changes in stock price crash risk with the onset of CDS contracts.

[Please insert Table 1 about here]

3.2 Institutional ownership and other variables

We extract corporate institutional ownership data from 13f dataset at Refinitiv. The Form 13F is a quarterly report that is required to be filed by institutional investment managers with at least $100 million in equity assets under management. This form is filed with the U.S. Securities and Exchange Commission (SEC) and is collected by Refinitiv. We use the aggregation of these filings to compute the percentage of shares held by large financial institutions. As reported in Panel A in Table 1, CDS-referenced firms on average have higher total institutional ownership and are held by a larger number of institutional shareholders. Moreover, the means of shareholders' ownership of CDS-referenced firms is much lower compared with non-CDS-referenced firms.

We follow the closely related prior literature to control the impact of other determinants of institutional ownership (e.g. Gompers and Metrick, 2001; Parrino, et al., 2003; Grinstein and Michaely, 2005; Chung and Zhang, 2011). For example, we extract the firm's fundamental data from COMPUSTAT, equity data from CRSP, analysts' forecasts data from I/B/E/S, loan data from Dealscan, corporate bond data from Mergent FISD and executive equity incentive information from Execucomp.

[Please Insert Table 2 about Here]

4. CDS trading and institutional ownership

4.1 Univariate Analysis

We conduct univariate analysis to understand the effect of CDS introduction on shareholders' ownership. Particularly, we focus on the firms that experienced CDS trading during our sample period. We examine the change of shareholders' ownerships a quarter before and after the inception of CDS. Upon on the CDS introduction, shareholders could stay, exit by dumping shares, and enter by purchasing shares. As reported in Panel A in Table 2, we find that the majority of shareholders, about 65%, choose to stay, while about 16% shareholders exit by selling all shares a quarter after the inception of CDS trading. We also document about 21% shareholders enter by adding the CDS-referenced firms in their portfolio. This evidence suggests shareholders' heterogenous behavior in response to credit derivatives.

Next, we examine the change of shareholders' ownership around CDS introduction. As reported in Panel B in Table 2, we find that both the aggregated institutional shareholders' ownership per firm and the ownership per investors increase after CDS introduction. Further break down shows that the increases of shareholders ownership are driven by the new shareholders after the inception of CDS trading. Moreover, we calculate the market value of share changes by multiplying the number of shares changes with the price per share at the end of the first quarter after CDS introduction, and report the results in Panel C in Table 2. It suggests that the market value of shares held by institutional shareholders increase by about USD $.144 million on average after the inception of CDS trading.

Then, we divide all institutional investors into five categories according to business type, including banks, insurance companies, investment companies, financial advisors and others. We find that all types of institutional investors changes significantly after CDS introduction. While for the top five largest changes, we find that independent advisors and others accounts for the majority of shareholders' ownership changes.

[Please Insert Table 2 about Here]

4.2 Multivariate Regression Model

We next run multivariate regressions to examine the influence of the initiation of CDS trading on a firm's institutional ownership (IO),

$$IO_t = \alpha_0 + \alpha_1 CDS\ Active_t + \sum_{i=1}^{m} \beta_i (i^{th}\ ControlVariable_t) + \varepsilon_t \qquad (1)$$

where IO_t denotes the aggregated ownership of various institutional investors at the end of quarter t. CDS_Active_{t-1} is an indicator that equals one after the quarter in which CDS transactions or quotes are observed for the first time during the whole sample period and zero otherwise. In addition, we use the total number of actual CDS transactions and the means of valid CDS quotes as alternative proxies for CDS activities to check the robustness of our results. We employ both OLS and Tobit for empirical estimation. In the baseline analysis, we use the aggregated ownership of all institutional investors in our baseline results. The control variables including firm size, age, and so on are based on prior literature.

4.3 Baseline results: CDS trading and institutional ownership

Table 3 reports the regression results using multivariate model (1). In column (1) and (2), we use the aggregated institutional shareholders' ownership of a firm as dependent variables. We document significant and negative coefficient of *CDS Active*. It suggests a significant decline of the aggregated institutional shareholders' ownership after CDS introduction. Economically, the total institutional shareholders' ownership decreases about 2.724% on average after the initiation of CDS. Comparing with the mean of total institutional shareholders' ownership, about 44.85%, in our sample, it is equivalent to about 6% increase of total institutional ownership after CDS introduction. This evidence support the argument in hypothesis 1 that the total institutional ownership declines after the introduction of CDS contracts.

Next, we use the total number of institutional shareholders as dependent variables in multivariate model (1) and report the regression results in column (3) and (4) in Table 3. We find significant and negative coefficient of *CDS Active*. It suggests that the total number of institutional shareholders decreases after the introduction of CDS contracts. Economically, the total number of institutional shareholders decreases about 0.218 on average after the inception of CDS.

[Please Insert Table 3 about Here]

Moreover, we use the institutional shareholders' ownership as dependent variables in model (1). Specifically, we employ two measures to reflect institutional shareholders' ownership. The first one is the mean of institutional shareholders' ownership per firm. The second one is the institutional shareholders' ownership. As reported in Table 4, we document significant and positive coefficients of *CDS Active* in all regression models. This evidence implies that institutional shareholders hold more shares on average after the introduction of CDS contracts.

Put all the evidence together, we find that total institutional ownership declines and the ownership becomes to be more concentrated after the inception of CDS activities, which support the conjecture in Hypothesis 1.

[Please Insert Table 4 about Here]

4.4 Endogeneity analysis

The introduction of CDS contract is not a random event, which might be affected by institutional equity ownership, or possibly omitted variables that drive both the likelihood of CDS inception and institutional ownership. To address these concerns and investigate the causality of CDS trading on institutional ownership, we employ the entropy balancing

approach. Hainmueller (2012) developed the entropy balancing method to achieve high covariate balance by maximizing the entropy reweighting scheme. The entropy reweighting scheme calibrates the optimal weight of treatment and control groups subject to a large set of prespecified balance conditions, such as first, second, and even higher moments. Using Monte Carlo simulation and empirical analysis, Hainmueller (2012) shows that the balance improvements using the entropy balancing method reduce model dependence on the estimation of treatment effects.

We adopt entropy balancing approaches by matching both the means and variance of CDS-referenced observations (treated group) with non-CDS-referenced observations (control group). Technically, we employ the entropy balancing technique provided by Hainmueller and Xu (2013) to calibrate the weights for both treated and control observations in our full sample. Next, we use weighted regressions to re-estimate our baseline model. Table 5 reports the regression results using the entropy balancing method. We continue to document significantly negative impact of CDS activities on the total institutional ownership and the total number of institutional shareholders as shown in column (1) and (2) in Table 5. We also find a significant increase of institutional ownership concentration measure in column (3) in Table 5. This evidence adds more credence to the argument in hypotheses 1.

[Please Insert Table 5 about Here]

5. Further analysis

We document a significant decline of institutional shareholders' ownership and an increase of ownership concentration after the introduction of CDS trading. In this section,

we conduct further analysis to examine the possible mechanism that drives the change of institutional shareholders' ownership in response to CDS activities. Specifically, we perform three cross-sectional analyses: the severity of empty creditor problem; the bargaining power of creditors; and the bargaining power of shareholders.

5.1 The Severity of the Empty creditor problem

Empty creditor problem raised by the introduction of CDS contracts could be one of the possible factors for the change of institutional shareholders' ownership. As aforementioned, empty creditor problem induced by CDS trading exacerbates the default risk of a firm (e.g. Bolton and Oehmke 2011; Subrahmanyam et al. 2014), which results in a decline of institutional shareholders' ownership. If this conjecture is valid, we expect more pronounced effects of CDS introduction on shareholders' ownership. We employ two proxies to reflect the severity of empty creditor problem. The first proxy is the actual CDS trades, denoted by *CDS Trade*. *CDS Trade* is an indicator that equals to one when there is actual CDS trades in a firm-quarter and zero otherwise. We introduce this proxy into multivariate regression model (1) and report the results in Panel A in Table 6. As expected, we document a further decline of total institutional shareholders' ownership and the total number of institutional shareholders, and a further increase of institutional shareholders' ownership on average when there are actual CDS trades.

Alternatively, we use the CDS "Big Bang" on July 26th, 2009 as a quasi-natural experiment. The CDS Big Bang in 2009 introduced several changes to the CDS market including CDS contract standardization, central clearing, and the implementation of an auction-based settlement process, which improves the efficiency of CDS markets and provides better protection to creditor in financial distress. Thus, we expect that the effects of CDS activities on the change of shareholders' ownership are stronger after CDS "Big Bang". To examine this conjecture, we introduce an indicator, denoted by *Bang*, that equals to one after the CDS "Big Bang" (July 26th, 2009) and zero otherwise. As reported in Panel B in Table 6, we find significant and negative coefficients of the interaction term between *CDS Active* and *Bang* when the dependent variables are *Total IO* and *# of IIs*, and significant and positive coefficient of the interaction term when the dependent

variable is *Mean IO*. It suggests further declines in the aggregated institutional shareholders' ownership, and greater concentration of shareholders' ownership after CDS "Big Bang", which further supports the argument of empty creditor problem.

[Please Insert Table 6 about Here]

5.2 Creditors' Bargaining power

CDS contract offers an insurance to CDS buyers to cover the loss given default. Such protection enhances creditors' bargaining power when a firm is in financial distress. Among all typo of creditors, banks are the most sophisticated and use CDS contract frequently in their credit risk management. Thus, the effect of CDS introduction on strengthening creditors' bargaining power is stronger when banks are involved. In this vein, we use the availability of syndicated bank loan to reflect creditors' bargaining power after CDS introduction. Particularly, we introduce an indicator, denoted by *Bank Loan*, that equals to one if a firm has bank loans in a quarter and zero otherwise.

Table 7 reports the regression results after incorporating *Bank Loan* in the multivariate regression model (1). We find significant and negative coefficients of the interaction term between CDS trade and Bank Loan when the dependent variables are *Total IO* and *# of IIs*, significant and positive coefficients of the interaction term when the dependent variable is *Mean IO*. This evidence suggests that the effects of CDS activities on the total institutional shareholders' ownership, the number of institutional shareholders and the concentration of shareholders' ownership is much stronger when banks are involved in the creditors.

[Please Insert Table 7 about Here]

5.3 Shareholders' bargaining power

Besides creditors' bargaining power, shareholders' bargaining power could be another possible factor that affects the relationship between CDS activities and

shareholders' ownership. A stronger shareholders' bargaining power attracts more institutional shareholders, which might alleviate the impact of CDS activities on the decline of total institutional shareholders' ownership, the number of institutional shareholders as well as the ownership concentration.

We use total institutional shareholders' ownership to reflect shareholders' bargaining power. Higher total institutional shareholders' ownership is associated with stronger shareholders' bargaining power when a firm is in financial distress. We split our sample into two groups according to the level of total institutional shareholders' ownership. We introduce an indicator, denoted by *High IO*, that equals to one when an observation belongs to the group with high institutional ownership, and zero otherwise. As reported in Table 8, we document significant and positive coefficient of the interaction term between *CDS trade* and *High IO* when the dependent variables are *Total IO* and *# of IIs*, significant and negative coefficient of the interaction term when the dependent variable is *Mean IO*. This evidence supports our conjecture that a stronger shareholders' bargaining power alleviates the impact of CDS activities on total institutional shareholders' ownership, the total number of institutional shareholders and ownership concentration.

[Please Insert Table 8 about Here]

6. Conclusion

This study investigates the impact of CDS introduction on shareholders ownership. We find that the total institutional shareholders' ownership and the total number of institutional shareholders decreases while shareholders' ownership becomes to be more concentrated after the inception of CDS activities. Further analysis shows that these impact of CDS introduction on institutional shareholders' ownership is more pronounced when creditors' bargaining power is strong and shareholders' bargaining power is weak.

Our findings shed lights on the active response of shareholders to the presence of empty creditor after CDS introduction, which identifies a novel channel through which credit derivatives market affects the equity markets. Our findings also open multiple

venues for further study to further understand shareholders behaviour in response to credit derivatives trading. For instance, since different type of shareholders change shareholdings for various purpose, it would be helpful to identify the heterogeneity of shareholders in response to the empty creditor in further study.

Appendix A: Variable Definitions

Variables	Definition
Institutional variables	
Total IO	The aggregated share ownership of all institutions reported in 13F and 13G at the end of each quarter.
Mean IO	The means of share ownership for a firm reported in 13F and 13G at the end of each quarter.
# of IIs	The total number of institutional investors in a firm.
CDS Trading indicators	
CDS Active	This indicator equals to one after the inception of CDS trading or quotes for a firm and zero otherwise.
Log Trades	The logarithm of the cumulative number of actual CDS trades plus one for a firm in a quarter. We assume that *LOG_TRADES* is zero for the firms without CDS contracts.
Log Quotes	Markit provides the number of distinct dealers who provide 5-year CDS quotes on a daily frequency. *LOG_QUOTES* is the logarithm of the average number of distinct dealers for a firm in a quarter. We assume that *LOG_QUOTES* is zero for the firms without CDS contracts.
Firm's Characteristics	
Vol	The volatility of monthly stock return in previous 12 months.
Ret3	The cumulative monthly stock return in the previous 3 months.
Ret9	The cumulative monthly stock return during a 9-month period from previous 3-month to 12-month.
Turn3	The average monthly turnover ratio in previous 3 months.
Log Price	The natural logarithm of stock price at the end of each quarter.
Log Age	The natural logarithm of the age of a firm plus one. The age of a firm is the total number of quarters since this firms included in CRSP dataset for the first time.
Div Yield	The ratio of cash dividends over the total assets.
Analysts	The natural logarithm of the number of financial analysts who follow this firm in a quarter plus one.
SP500	The indicator that equals to one for the firms that are included in S&P 500 index and zero otherwise.

Leverage	The ratio of the long-term debt over the total assets.
Size	The natural logarithm of total assets.
ROA	The ratio of income before extraordinary items over total assets.
MB	The ratio of market value of equity over the book value of equity. The market value of equity equals to the price times the number of shares outstanding at the end of each quarter.

References

Acharya, V., and Johnson, C., 2007. Insider trading in credit derivatives . *Journal of Financial Economics* 84(1),110-141.

Almazan, A., Hartzell, J., and Starks, L., 2005. Active institutional shareholders and cost of monitoring: evidence from executive compensation. *Financial Management* 34, 5-34.

Ashcraft, A. B., and Santos, J. A., 2009. Has the CDS market lowered the cost of corporate debt? *Journal of Monetary Economics*, 56(4), 514-523.

Atkeson, Andrew, Andrea L. Eisfeldt and Pierre-Olivier Weill, 2013, The market of OTC derivatives, NBER Working paper 18912. Available at http://www.nber.org/papers/w18912.

Augustin P, Subrahmanyam, G., Tang, Y., et al., 2014. Credit Default Swaps – A Survey. *Foundations & Trends® in Finance* 9(1-2),1-196.

Bartlett, R. P., 2015. Do institutional investors value the rule 10b-5 private right of action? Evidence from investors' trading behavior following Morrison v. National Australia Bank Ltd. *The Journal of Legal Studies* 44(1), 183-227.

Batta, E., Qiu, P., and Yu, F., 2016. Credit derivatives and analyst behavior, *The Accounting Review* 91(5), 1315-1343.

Bolton, P., and Oehmke, M., 2011. Credit Default Swaps and the Empty Creditor Problem. *Review of Financial Studies* 24(8), 2617–2655.

Bolton, P., Scheinkman, J., Xiong, W., 2006. Executive compensation and short-termist behaviour in speculative markets. *Review of Economics Studies* 73, 577-610.

Brickley, J., Lease, R., and Smith Jr., C., 1988. Ownership structure and voting on antitakeover amendments. *Journal of Financial Economics* 20, 267-291.

Bushman, Robert, M., Abbie J. Smith, and Regina Wittenberg-Moerman, 2010, Price discovery and dissemination of private information by loan syndicate participants, *Journal of Accounting Research* 48(5), 921-972.

Callen, L., and Fang, X., 2013. Institutional investor stability and crash risk: Monitoring versus short-termism?. *Journal of Banking & Finance* 37(8), 3047-3063.

Chen, X., Harford, J., and Li, K., 2007. Monitoring: which institutions matter? *Journal of Financial Economics* 86, 279-305.

Cohn, J.B., Gillan, S. L., and Hartzell, J. C., 2016. On enhancing shareholder control: A (Dodd-) Frank assessment of proxy access. *The Journal of Finance* 4, 1623-1668.

Cornett, M. M., Marcus, A. J., Saunders, A., and Tehranian, H., 2007. The impact of institutional ownership on corporate operating performance. *Journal of Banking and Finance* 31 (6), 1771-1794.

Danis, A., 2017. Do empty creditor matter? Evidence from distressed exchange offers. *Management Science*, Forthcoming.

Del Guercio, D., and Hawkins, J., 1999. The motivation and impact of pension fund activism. *Journal of Financial Economics* 52, 293-340.

Gaspar, J., Massa, M., and Matos, P., 2005. Shareholder investment horizons and the market for corporate control. *Journal of Financial Economics* 76, 135-165.

Hutton, P., Marcus, J., and Tehranian, H., 2009. Opaque Financial Report, R2, and Crash Risk. *Journal of Financial Economics* 94(1), 67-86.

Kim, B., Li. Y., and Zhang. L., 2011. CFOs versus CEOs: Equity incentives and crashes. *Journal of Financial Economics* 101(3), 713-730.

Kryzanowski, L., Perrakis, S., and Zhong, R., 2017. Price discovery in equity and CDS markets. Forthcoming on *Journal of Financial Markets*.

Kryzanowski, L., Perrakis, S., and Zhong, R., 2017. Financial oligopolies: theory and empirical evidence in the credit default swap markets. Working paper, Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2266051.

Li,Y., and Tang, Y., 2015. The leverage externalities of credit default swaps. *Journal of Financial Economics* 120(3), 491-513.

Martin, X., and Roychowdhury, S., 2015, Do financial market development influence accounting practices? Credit default swaps and borrowers' reporting conservatism?, *Journal of Accounting and Economics* 59(1), 80-104.

Minton, A., Stulz, R., and Williamson, R., 2009. How Much Do Banks Use Credit Derivatives to Hedge Loans?. *Journal of Financial Services Research* 35(1), 1-31.

Ni, S., and Pan, J., 2016. Trading puts and CDS on stocks with short sale ban. Working paper. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1572462

Nini, G., Smith, D. C., and Sufi, A., 2012. Creditor control rights, corporate governance, and firm value. *The Review of Financial Studies* 25(6), 1713-1761.

Qiu, J., and Yu, F., 2012. Endogenous liquidity in credit derivatives. *Journal of Financial Economics* 103(3), 611-631.

Shan, C. Y., Tang, D., and Yan, H., 2017. How does CDS trading affect bank lending relationship?, working paper, available at: http://www.sef.hku.hk/~yjtang/ShanTangYan_CDSLendingRelationship_24Aug2016.pdf

Subrahmanyam, G., Tang, Y., and Wang, Q., 2014. Does the Tail Wag the Dog? The Effect of Credit Default Swaps on Credit Risk. *The Review of Financial Studies* 27(10), 2927–2960.

Subrahmanyam, G., Tang, Y., and Wang, Q., 2017. Credit default swaps, exacting creditors and corporate liquidity management. *Journal of Finance Economics* 124 (2), 395-414.

Wang, X., Wu, Y., Yan, H., and Zhong, Z., 2017. Funding liquidity shocks in a natural experiment: evidence from the CDS big bang. Available at SSRN:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2730877.

Yan, X., and Zhang, Z., 2009. Institutional investors and equity returns: are short-term institutions better informed? *The Review of Financial Studies* 22, 893-924.

Table 1: Descriptive Statistics

This table reports the descriptive statistics of interested variables. CDS-firms are the firms that has CDS quotes during our sample period. The definitions of variables are reported in Appendix A.

Panel A: Institutional Investors

	All Firms			CDS-Referenced Firms		
	# of Obs.	Mean	Std. Dev	# of Obs.	Mean	Std. Dev
# of IIs	346338	115	188	57722	364	320
Total IO	346338	44.85%	30.50%	57722	69.06%	21.26%
Mean IO	346338	0.95%	1.28%	57722	0.34%	0.32%

Panel B: Other Variables

	All Firms			CDS-Firms		
	# of Obs.	Mean	Std. Dev	# of Obs.	Mean	Std. Dev
CDS Active	346338	0.105	0.306			
Vol	346338	0.144	0.107	57722	0.101	0.067
Ret3	346338	0.034	0.314	57722	0.041	0.220
Ret9	346338	0.110	0.609	57722	0.130	0.446
Turn3	346338	0.357	0.522	57722	0.442	0.448
Price	346338	21	23	57722	41	30
Age	346338	190	188	57722	357	272
Div Yield	346338	0.04%	0.35%	57722	0.14%	0.64%
Analysts	346338	5.140	6.549	57722	13.543	8.229
SP500	346338	0.106	0.308	57722	0.535	0.499
Leverage	346338	0.148	0.170	57722	0.247	0.161
Size	346338	5.960	2.157	57722	8.806	1.588
ROA	346338	-0.010	0.075	57722	0.011	0.030
MB	346338	3.358	7.784	57722	3.948	9.743

Table 2: Institutional Investors' Activities around the Inception of CDS Trading

This table reports the change of shareholders' ownership around the inception of CDS trading. We calculate the change of shareholders' ownership as the difference of average ownership four quarters before and after the inception of CDS trading. *STAY* denotes the shareholders who have positive ownership both before and after the inception of CDS trading. *EXIT* denotes the shareholders who have positive ownership before but zero ownership after the inception of CDS trading. *NEW* denotes the shareholders who have zero ownership before but positive ownership after the inception of CDS trading.

Panel A: The institutional investors

	# of CDS-firms	# of institutional investors				
		Mean	Std. Dev	P5	P50	P95
IIs All	733	527	344	166	439	1260
Investor responses						
IIs Stay	720	342	271	90	262	938
IIs Exit	720	82	51	27	72	171
IIs Enter	732	111	78	32	94	223

Panel B: The change of institutional investors' ownership

		Investor		Firms	
	# of firms	Mean	Median	Mean	Median
IIs All	733	0.0067	-0.0013	3.53	2.24
Investor responses					
IIs Stay	720	-0.0091	-0.0030	-3.10	-1.51
IIs Exit	720	-0.2614	-0.2101	-21.46	-19.84
IIs Enter	732	0.2505	0.2061	27.70	24.10

Panel C: The change of market value of shares

		Investor		Firms	
	# of firms	Mean	Median	Mean	Median
IIs All	733	1.44	0.68	760.02	211.13
Investor responses					
IIs Stay	720	-0.10	0.28	-33.18	53.92
IIs Exit	720	-21.19	-15.82	-1740	-871.67
IIs Enter	732	22.66	16.21	2505	1153

Panel D: Business Type – Top 5 largest changes of ownership						
Type of Investor Responses	# of CDS Firms	Business Type				
		Bank	Insurance Companies	Investment Companies	Independent Advisor	All others
IIs All	733	521	120	74	471	2478
Investor Response						
IIs Stay	720	508	118	71	452	2401
IIs Exit	720	1	0	0	5	9
IIs Enter	732	12	2	3	14	68

Panel E: Business Type – All institutional investors						
Type of Investor Responses	# of CDS Firms	Business Type				
		Bank	Insurance Companies	Investment Companies	Independent Advisor	All others
IIs All	733	48465	8795	6859	57588	264674
Investor Response						
IIs Stay	720	34835	6801	4801	32898	167064
IIs Exit	720	7048	1057	1212	10862	38902
IIs Enter	732	6582	937	846	13828	58708

Table 3: CDS Trading and Shareholder Ownerships

This table reports the regression results regarding the impact of CDS initiation on the total institutional ownership and the total number of institutional investors. *IO_ALL* is the total institutional ownership in a firm-quarter. *IO_NUM* is the total number of institutional investors in a firm-quarter. The key independent variable is *CDS_Incep* that is an indicator that equals to one after the occurrence of CDS quotes or transactions for the first time during the whole sample period and zero otherwise. The definitions of other variables are described in Appendix A. The standard errors are robust and clustered at firm level. The standard errors are reported in the parentheses. The symbols *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Variables	*Total IO*	*Total IOs*	*# of IIs*	*# of IIs*
CDS Active	-2.724***	-5.070***	-0.218***	-0.265***
	(0.575)	(0.770)	(0.016)	(0.022)
Vol	-8.179***	-12.152***	0.150***	0.245***
	(0.734)	(1.036)	(0.024)	(0.034)
Ret3	-1.271***	-1.324***	-0.072***	-0.013**
	(0.132)	(0.179)	(0.004)	(0.006)
Ret9	0.115	0.011	0.014***	0.039***
	(0.085)	(0.119)	(0.003)	(0.004)
Turn3	1.425***	3.263***	0.059***	0.096***
	(0.136)	(0.237)	(0.004)	(0.007)
Log Price	6.267***	7.308***	0.284***	0.229***
	(0.219)	(0.264)	(0.007)	(0.008)
Log Age	3.422***	0.784***	0.128***	0.064***
	(0.238)	(0.153)	(0.007)	(0.005)
Div Yield	94.100***	-1.779	1.972***	1.354
	(21.528)	(45.045)	(0.580)	(0.857)
Analysts	5.853***	9.612***	0.246***	0.406***
	(0.206)	(0.275)	(0.007)	(0.008)
SP500	-6.143***	-11.627***	0.029	0.041*
	(0.919)	(0.832)	(0.029)	(0.023)
Leverage	-6.935***	4.237***	-0.509***	-0.620***
	(0.894)	(1.111)	(0.027)	(0.033)
Size	4.188***	3.992***	0.313***	0.376***
	(0.239)	(0.191)	(0.008)	(0.006)
ROA	-1.160	3.618***	-0.064**	-0.260***
	(0.707)	(1.197)	(0.025)	(0.042)
MB	0.494	-5.025***	0.309***	0.811***
	(0.749)	(1.368)	(0.029)	(0.046)
Intercept	-27.058***	-15.954***	-0.031	0.043
	(1.447)	(3.464)	(0.046)	(0.089)
Year FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Firm FE	Yes	No	Yes	No
Industry FE	No	Yes	No	Yes
Adj R-square	0.38	0.59	0.54	0.83
# of Obs	346,338	346,338	346,338	346,338

Table 4: CDS Trading and Ownership Concentration

This table reports the regression results regarding the impact of CDS initiation on ownership of concentration. We use the means of institutional ownerships, denoted by *IO_MEAN*, and the ownership of each institutional investor, denoted by *IO_INVESTOR*, to reflect the concentration of ownership. The key independent variable is *CDS_Incep* that is an indicator that equals to one after the occurrence of CDS quotes or transactions for the first time during the whole sample period and zero otherwise. The definitions of other variables are described in Appendix A. The standard errors are robust and clustered at firm level. The standard errors are reported in the parentheses. The symbols *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Dependent Variables	*Mean IO*	*Mean IO*	*Investor IO*
CDS Active	0.080***	0.123***	0.069***
	(0.013)	(0.015)	(0.003)
Vol	-0.234***	-0.781***	-0.135***
	(0.055)	(0.065)	(0.017)
Ret3	0.062***	0.038***	0.016***
	(0.011)	(0.011)	(0.002)
Ret9	-0.008	-0.024***	-0.017***
	(0.005)	(0.005)	(0.001)
Turn3	-0.059***	-0.084***	-0.034***
	(0.006)	(0.007)	(0.002)
Log Price	-0.099***	-0.043***	-0.055***
	(0.009)	(0.009)	(0.002)
Log Age	-0.045***	-0.044***	-0.030***
	(0.009)	(0.006)	(0.001)
Div Yield	0.835**	2.140*	1.279***
	(0.362)	(1.233)	(0.134)
Analysts	-0.084***	-0.144***	-0.106***
	(0.009)	(0.009)	(0.003)
SP500	0.026**	0.053***	-0.072***
	(0.011)	(0.018)	(0.003)
Leverage	0.202***	0.483***	0.171***
	(0.042)	(0.044)	(0.008)
Size	-0.107***	-0.169***	-0.102***
	(0.015)	(0.009)	(0.001)
ROA	-0.026	0.459***	0.017
	(0.052)	(0.077)	(0.021)
MB	-0.155***	-0.820***	-0.000***
	(0.048)	(0.059)	(0.000)
Intercept	2.359***	3.231***	2.003***
	(0.067)	(0.263)	(0.033)
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	No	No
Industry FE	No	Yes	Yes
Adj R-square	0.03	0.16	0.05
# of Obs.	346,338	346,338	38,642,630

Table 5: Entropy Balancing Approach

This table reports the regression results to check the robustness of the relationship between CDS trading and institutional ownership using entropy balancing method. We define the CDS-referenced observations as treated observations and the non-CDS-referenced observations as control observations. Each regression includes treated and control observations with different weights. The weights are obtained through an iterative process that ensures the mean and variance of all matched variables are approximately the same between the treated and the control groups. We only report the coefficients of *CDS_ACTIVE* in this table. *Other Controls* includes all control variables in our baseline regression. We control year-, quarter- and firm-fixed effects in all regressions. The variable definitions are given in Appendix A. The standard errors are robust and clustered at the firm level. The *t-statistics* are reported in parentheses. The symbols *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

Variables	*Total IO*	*# of IIs*	*Mean IO*
CDS Active	-4.491***	-0.216***	0.083***
	(0.599)	(0.021)	(0.013)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Adj R-square	0.23	0.28	0.01
# of Obs.	346,338	346,338	346,338

Table 6: Empty Creditor Problem: The Intensity of CDS Activities

This table reports the regression results on the impact of empty creditor problem on the relationship between CDS trading and institutional ownership. We employ two variables to proxy for the severity of empty creditor problem: (1) *CDS Trade* is an indicator that equals to one when there is actual CDS trades in a firm-quarter and zero otherwise; (2) *Bang* is an indicator that equals to one after the CDS "Big Bang" (July 26th, 2009) and zero otherwise. *Total IOs* is the total institutional ownership in a firm-quarter. *# of IIs* is the total number of institutional investors in a firm-quarter. *CDS Active* is an indicator that equals to one after the occurrence of CDS quotes or transactions for the first time during the whole sample period and zero otherwise. The definitions of other variables are described in Appendix A. The standard errors are robust and clustered at firm level. The standard errors are reported in the parentheses. The symbols *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Panel A: CDS Trades

Dependent Variables	*Total IOs*	*# of IIs*	*Mean IO*
CDS Trade	-1.169***	-0.059***	0.014***
	(0.367)	(0.008)	(0.005)
CDS Active	-0.438	-0.150***	0.046***
	(0.447)	(0.010)	(0.012)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Adj R-square	0.43	0.67	0.02
No. of Obs	253,810	253,810	253,810

Panel B: CDS Big Bang

Dependent Variables	*Total IOs*	*# of IIs*	*Mean IO*
*CDS Active * Bang*	-6.074***	-0.160***	0.109***
	(0.755)	(0.028)	(0.013)
CDS Active	-0.221	-0.152***	0.035***
	(0.493)	(0.013)	(0.011)
Bang	-0.755***	-0.085***	0.023**
	(0.202)	(0.006)	(0.009)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Adj R-square	0.38	0.54	0.03
# of Obs.	346,338	346,338	346,338

Table 7: Creditors' Bargaining Power: Bank Loans

This table reports the regression results on the impact of creditors' bargaining power on the relationship between CDS indicators and the characteristics of institutional ownership. We employ the presence of bank loan to proxy for creditors' bargaining power. Banks have a stronger bargaining power in contrast to other creditors. *Bank Loan* is and indicator that equals to one if a firm has bank loans in a quarter and zero otherwise. *Total IO* is the total institutional shareholders' ownership in a firm-quarter. *# of IIs* is the total number of institutional shareholders in a firm-quarter. *CDS Active* is an indicator that equals to one after the occurrence of CDS quotes or transactions for the first time, and zero otherwise. The detailed definitions of other variables are in Appendix A. The standard errors are robust and clustered by firm. The standard errors are reported in the parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Variables	*Total IO*	*# of IIs*	*Mean IO*
*CDS Active*Bank Loan*	-1.283**	-0.084***	-0.010
	(0.615)	(0.020)	(0.011)
CDS Active	-2.352***	-0.194***	0.083***
	(0.545)	(0.015)	(0.013)
Bank Loan	0.669***	0.024***	0.014
	(0.228)	(0.008)	(0.010)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Adj R-square	0.38	0.54	0.03
# of Obs.	346,338	346,338	346,338

Table 8: Shareholders' Bargaining Power: Institutional Ownership

This table reports the regression results on the impact of shareholders' bargaining power on the relationship between CDS indicators and the characteristics of institutional ownership. We employ the aggregated institutional shareholders' ownership to reflect shareholders' bargaining power. The higher percentage of institutional ownership suggests a stronger bargaining power of shareholders. We divide observations into two groups according to the median of institutional ownership. *High IO* is an indicator that equals to one when an observation belongs to the group with high institutional ownership, and zero otherwise. *Total IO* is the total institutional shareholders' ownership in a firm-quarter. *# of IO* is the total number of institutional shareholders in a firm-quarter. *CDS Active* is an indicator that equals to one after the occurrence of CDS quotes or transactions for the first time, and zero otherwise. The detailed definitions of variables are in Appendix A. The standard errors are robust and clustered by firm. The standard errors are reported in the parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Dependent Variables	*Total IO*	*# of IO*	*Mean IO*
*CDS Active*High IO*	7.503***	0.489***	-0.501***
	(1.958)	(0.089)	(0.030)
CDS Active	-8.545***	-0.637***	0.539***
	(1.960)	(0.088)	(0.033)
High IO	27.388***	0.400***	0.607***
	(0.341)	(0.013)	(0.024)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Adj R-square	0.61	0.58	0.06
# of Obs.	346,338	346,338	346,338