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The Effect of CDS Trading on Product Market Competition: Evidence from 10-K Filings

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Abstract: This paper examines how the initiation of credit default swap (CDS) trading affects the product market competition faced by the referenced firms in the US. The trading of CDS provides an avenue for creditors to hedge default risks, thereby weakening the incentives to monitor the borrowers. Our paper shows that the trading of CDS increases firm-level product market competition because a reduced creditor monitoring effect can lead to growing shareholder demand for information disclosure, revealing strategic information that may undermine the product market competency of the firm when disclosed. While prior literature shows that CDS-traded firms increase both the likelihood and frequency of earnings forecasts as a direct response to shareholder demand, we observe that firms made their mandatory disclosure (i.e., Form 10-K) less readable as a potential way to reduce strategic disclosure. We also find that the presence of institutional investors generally reduces a firm's competition, but this positive effect is overturned in the presence of CDS trading.

Keywords: credit default swap; product market competition; readability; institutional holding; empty creditors; information disclosure; 10-K filings

JEL Classification: D40; G1; G20; G21; G23; G30; L10



Citation: Hu, Changjie, Ming Liu, and Weiyu Jiang. 2023. The Effect of CDS Trading on Product Market Competition: Evidence from 10-K Filings. *Journal of Risk and Financial Management* 16: 207. <https://doi.org/10.3390/jrfm16030207>

Academic Editor: Kudret Topyan

Received: 12 February 2023

Revised: 10 March 2023

Accepted: 16 March 2023

Published: 22 March 2023



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1. Introduction

This paper explores the impact of credit default swap (CDS) trading on a firm's forward-looking competitive threat in the product market. It also examines whether managers adjust the language in annual reports, such as readability and tone in Form 10-K, to affect information processing costs and escape potential competition. The introduction of CDS has revolutionized the debt market by enabling the transfer of credit risks without transferring ownership rights (Marsh 2006; Stulz 2010; Parlour and Winton 2013). This new instrument provides a way for investors to hedge credit risk, leading to increased liquidity and flexibility in the financial market (Greenspan 2004). Sufi (2007) shows that loan contracts depend heavily on information collection and monitoring by creditors. The onset of CDS trading will inevitably impact lenders' incentives to monitor borrowers' actions or demand information due to a dilution of risks associated with debt ownership (Pennacchi 1988; Gorton and Pennacchi 1995).

Firm managers generally hold a superior information advantage over outsiders about the true performance of the firm. Kim et al. (2018) document that a reduced creditor incentive to monitor the borrower after CDS trading initiation can lead to shareholders demanding more information from the management. They show that managers increase both the likelihood and the frequency of earnings forecasts. Equivalently, Vashishtha (2014) finds that shareholders reduce their demand for voluntary disclosure when creditors increase monitoring intensity after violations of debt covenants. However, a firm's product market is tightly linked to the information environment since proprietary and strategic

information allows firms to retain their competitive advantage in the long run (Graham et al. 2005). This disincentive to disclose information by firms is documented by the prior literature as the proprietary cost hypothesis. Another study by Li (2010) also shows how competitive threats may significantly impact both the quality and quantity of a firm's disclosure.

Our paper first predicts that the initiation of CDS trading increases firm-level product market competition because reduced monitoring from creditors leads to increased shareholder demand for more information disclosure, thereby revealing strategic information that may undermine the competitive advantages of the firm. Using textual-based firm-level measures for competitive threats recently developed by Hoberg et al. (2014) and Li et al. (2013), we present evidence that the onset of CDS trading leads to bigger competitive threats faced by the referenced firm. The potential disclosure of additional proprietary and strategic information can be detrimental to the prospects of the firms, which is likely reflected by managers in the qualitative statements that discuss a firm's current as well as forward-looking competition landscape.

A priori, there exists tension regarding whether CDS trading also affects mandatory disclosure. While prior literature documents a positive correlation between CDS trading initiation and voluntary disclosure, few have looked explicitly at the disclosure of soft information. With heightened investor demand for information following CDS initiation, firms have the option of either providing more disclosure in annual reports to complement voluntary disclosure or strategically increasing information processing costs by making information less accessible to competitors. The latter is possible because managers have considerable latitude in shaping the content of qualitative information. Empirically, we find evidence that firms made their mandatory disclosure (i.e., Form 10-K) less readable, potentially as a strategy to increase information opacity to escape competition.

In this paper, we also investigate the role of institutional holdings. Institutional investors are sophisticated larger stakeholders who might take over the monitoring role of the creditors after CDS initiation (Chung et al. 2002). Prior literature has also documented that institutional investors can effectively reduce the opportunistic behavior of firms (Bushee 1998; Hartzell and Starks 2003). Institutional presence may partially alleviate the concern of managers expropriating the shareholders due to information asymmetry and, hence, lead to reduced demand for information disclosure from the shareholders. We first observe that the presence of high institutional holdings per se reduces competition. However, at the onset of CDS trading, the presence of high institutional holdings appears to heighten competitive threats even more. This interesting observation may be ascribed to institutional investors, who have substantial ownership stakes, demanding even more information transparency after CDS initiation (Boone and White 2015; Bird and Karolyi 2016). Arguably, the potential positive moderating effect from the shifting of the monitoring role to institutional investors appears to be entirely offset by the additional demand for disclosure.

Our study makes several important contributions to the literature. To the best of our knowledge, we are the first to provide explicit evidence of a relation between firm-level product market competition and the trading of CDS for the referenced firms. Our paper also fills the gap in the literature regarding the consequences of the CDS trading and the determinants of information disclosure as well as the interactive role of institutional investors in shaping a firm's disclosure strategy in the product market. Finally, we complement the existing literature that examines the general impact of CDS market development. The empirical findings of this paper potentially provide valuable policy implications for security regulation, particularly with regard to the information disclosure mechanism of firms in both CDS- and non-CDS-traded markets around the world.

The rest of the paper is organized as follows: Section 2 reviews the existing literature and develops our hypotheses. Section 3 explains the process of our sample construction and empirical designs. Section 4 discusses the main results. Section 5 concludes.

2. Literature and Hypotheses Development

2.1. CDS and Monitoring

The innovation of credit default swaps has provided an additional avenue for debt market investors to hedge credit risk exposure. However, being able to hedge credit risk also means that lenders have weaker incentives to monitor their borrowers (Morrison 2005; Ashcraft and Santos 2009; Shan et al. 2019). Prior literature has also documented the “empty creditor problem,” in which lenders could push borrowers into inefficient bankruptcy or liquidation since lenders may be more reluctant to restructure a distressed debt (Hu and Black 2008; Bolton and Oehmke 2011).

In traditional loans, creditors will naturally have the incentives to monitor the debtors to avoid any unnecessary default or financial distress. In the case of a syndicated loan, however, the lead arranger, has an incentive to overstate the quality of the syndicated loan and shirk its monitoring role. Therefore, the lead arranger banks in loan syndication will typically retain a larger share of the loan and perform intense monitoring and due diligence of the debtors (Sufi 2007). Nonetheless, CDS trading allows the lead arranger to hedge its credit risk and potentially reduces the effectiveness of using ownership as a means to reduce information asymmetry in a syndicated loan. Pennacchi (1988) and Gorton and Pennacchi (1995) show that by selling a portion of the loan in the secondary market, creditors experience a significant reduction in their incentives to monitor the debtors. Unlike the transfer of ownership rights when a loan is sold to another buyer, the resulting moral hazard problem is heightened when the availability of CDS allows for just the transfer of credit risks. Amiram et al. (2017) find that the initiation of CDS trading increases the share of loans retained by loan syndicate lead arrangers and increases loan spread, suggesting CDS initiation reduces the effectiveness of a lead arranger’s stake in the loan as a mechanism to address the adverse selection and moral hazard problems. Wong and Yu (2022) develop a theoretical model and predict that CDS trading expands debt capacity and allows firms to undertake more positive NPV projects. As a result, CDS firms tend to have more volatile equity returns than non-CDS firms.

Prior literature has also documented evidence that reduced monitoring induced by the transferring of credit risk through CDS can encourage risk-taking behavior. Ashcraft and Santos (2009) show that the borrowing cost increased for risky and informationally opaque firms after they were referenced in CDS contracts. Martin and Roychowdhury (2015) reveal that the initiation of CDS can lead to a decline in a firm’s reporting conservatism. Chen et al. (2019) find that boards offer pay packages for managers that encourage greater risk-taking to take advantage of the reduced creditor monitoring after CDS introduction. Chang et al. (2019) show that CDS trading allows firms to pursue more risky and original innovations by enhancing lenders’ risk tolerance and borrowers’ risk-taking.

As a result, the decreased monitoring from creditors and increased risk-taking behavior can motivate shareholders to request additional information disclosure. A recent study by Kim et al. (2018) argues that the initiation of CDS is associated with increased voluntary disclosures by managers. Similarly, Vashishtha (2014) finds that enhanced creditor monitoring leads to decreased corporate disclosure.

Based on prior studies that document an increased information disclosure from CDS-traded firms, we arrive at our first hypothesis:

H1. *The initiation of CDS trading increases the competitive threats from rival firms.*

This hypothesis is established on the ground that CDS trading leads to the disclosure of more proprietary and strategic information that is crucial to retaining the current competitive advantage of a firm (Graham et al. 2005). The advent of new forward-looking competition measures from Hoberg et al. (2014) and Li et al. (2013) allows us to delve into competitive landscapes at the firm level. In contrast, classical measures such as the market concentration ratio (CR) or the Herfindahl-Hirschman index (HHI) only capture competition at the industry level and rely on historical sales data.

2.2. Institutional Investors

While creditor monitoring is one channel that affects corporate governance, institutional monitoring is another prominent factor that limits potential agency problems within the firm. The presence of institutional monitoring can effectively reduce the opportunistic behavior of the firms (Bushee 1998; Hartzell and Starks 2003). The literature has also provided evidence on institutional investors' monitoring and suggests that institutional ownership restrains earning management activities, improves corporate innovation, and drives corporate social responsibility (Dyck et al. 2019; Kim et al. 2019; Lel 2019; Lewellen and Lewellen 2022).

In the presence of institutional investors, other shareholders may freeride monitoring efforts and are less concerned about potential agency conflicts with the managers, and hence demand less information disclosure. The above argument leads to our second hypothesis:

H2a. *The increase in competitive threats due to CDS trading is less pronounced in firms with a high institutional presence.*

The intuition behind the hypothesis is that the presence of institutional investors will take over the monitoring of the creditors whose credit risks are hedged through CDS. It thus reduces additional demand for information disclosure from the general shareholders, since potential agency problems from CDS trading will be of less concern when institutional investors are expected to take over the monitoring role from creditors. Therefore, a firm may not experience increased competitive threats when it is no longer under shareholder pressure to disclose strategic information beyond an optimal level.

On the other hand, another stream of literature documents that institutional investors, usually with significant ownership stakes, may themselves demand greater disclosure from the firm.¹ According to Healy et al. (1999), a rise in disclosure is associated with increased institutional ownership. Bird and Karolyi (2016) examine the impact of institutional ownership on a firm's disclosure policy and document that firms with an exogenous increase in institutional ownership disclose longer 8-K filings together with more embedded graphics. Another study by Boone and White (2015) shows that firms with greater institutional presence tend to have a higher level of management disclosure and analyst following, leading to lower information asymmetry.

The above literature leads to our alternative hypothesis:

H2b. *The increase in competitive threats due to CDS trading is more pronounced in firms with a high institutional presence.*

While institutional investors may assume some of the monitoring roles from credit-hedged lenders leading to lower disclosure demand from the other general investors, they, as the shareholders with substantial ownership stakes, may demand additional disclosure from the firm.²

2.3. Delving into the Information Channel

Managers play a significant role in a firm's disclosure policy. Several studies find that the management is more forthcoming in information disclosure when the performance of their firms is good (Lang and Lundholm 1993; Schrand and Walther 2000). Li (2008) finds that the linguistic features of annual reports and firm performance are highly correlated and that the readability of a firm's disclosure can be a strategic feature used by managers. Common measures for readability include the Fog index, the length of 10-K annual reports, and the Flesch–Kincaid measure, which are reasonable proxies for the cost of processing information (Lehavy et al. 2011). While Kim et al. (2018) document that CDS trading leads to greater voluntary disclosure, it is still unclear how firms will change the linguistic features of mandatory reports. Earnings forecasts can be straightforward and relatively easy to interpret, but the disclosure of qualitative information may not be as forthright. It is possible that a firm attempts to offset the over-revelation of strategic information in voluntary disclosure by making other means of disclosure less accessible and more

costly to process, to defend its advantageous competitive position. However, it will also be unsurprising if shareholders pressure firms to make information more accessible through mandatory annual filings to alleviate agency conflicts. This then leads to another set of competing hypotheses:

H3a. *The initiation of CDS trading increases the readability of mandatory disclosures.*

H3b. *The initiation of CDS trading decreases the readability of mandatory disclosures.*

Should *H3a* be supported, one may argue that the shareholders' increasing demand for information in the post-CDS-trading period not only results in greater voluntary disclosure but also leads to more accessible information in annual reports (i.e., 10-K filings). If *H3b* is supported, one can argue that managers potentially make annual reports less readable in an attempt to hide strategic information. What we observe empirically may be a direct manifestation of changes in the competitive landscape after CDS initiation.

3. Materials and Methods

3.1. Sample Construction

We construct our initial sample by retrieving all firm-year observations from Compustat between 1994 to 2013 for the US public firms. We then identify the year of CDS initiation through CDS trading data from Datastream. Following prior literature, we define the earliest year in which a firm's five-year-to-maturity CDS contract was traded as the CDS initiation year of that firm.³ The control group consists of firms without an initiation date and CDS-traded firms before CDS initiation.

Our primary measure of competition is the *Fluidity* variable, as constructed in [Hoberg et al. \(2014\)](#). *Fluidity* captures the variation in a firm's product space with respect to the actions of its competitors. It is an ex-ante linguistic measure of threats in the product market. If there is a greater overlap between a firm's products and the changes in its competitors', the firm will be deemed to be facing stronger competition. We obtain *Fluidity* data from the Hoberg-Philips Data Library. We additionally use *Pctcomp* as an alternative measure of competition as constructed in [Li et al. \(2013\)](#) for robustness.⁴ *Pctcomp* measures the number of times competition-related words appear, which serves as an indication of competitive pressure faced by the firm from the perspective of the managers. Both measures of competition are based on the firm-level textual analysis of management's disclosures in 10-K filings, whereas traditional measures such as the Herfindahl index (*HHI*) and market concentration ratios (*CR*) are industry-specific. Empirically, *Fluidity* and *Pctcomp* should capture greater variation in the product market space. Another advantage over traditional measures is that both consider competitive threats from non-public firms, which constitute a significant portion of the product market.

We first merge firm financial data from Compustat with the CDS initiation data from Datastream. We then supplement it with institutional holding data obtained from the SEC Form 13F. Following [Li \(2008\)](#), we use several readability measures, which include the Fog Index, the number of words, and the Flesch–Kincaid measure for 10-K filings. Following prior literature, we dropped utility and financial firms that start with a SIC code of 6 (i.e., 6000–6999) or have a SIC code between 4900 and 4949 ([John et al. 2011](#); [Landsman et al. 2023](#)). Our final raw sample contains 65,762 firm-year observations between 1994 and 2013.⁵ Our sample size is further reduced to 51,043 and 26,379 firm-year observations after dropping firms with missing *Fluidity* and *Pctcomp* measures in some of our regression setups.

3.2. Empirical Design

Following [Landsman et al. \(2023\)](#), we estimate a linear regression model of competition measures against the dummy that denotes CDS trading (i.e., *Tradedpost*). This setup is essentially a version of the difference-in-difference research design, as in [Bertrand and Mullainathan \(2003\)](#), that controls for both firm and year fixed effects. We also control

for lagged firm-specific characteristics in all our tests. More specifically, we test our first hypothesis by estimating the following regression model:

$$Competition_{i,t} = \beta_1 Tradedpost_{i,t} + \gamma Controls + Fixed\ Effects + e_{i,t} \quad (1)$$

Fluidity captures the forward-looking competitive threat faced by the firm through the textual analysis of 10-K filings. We also use *Pctcomp*, which gauges the sentiment of the manager with regard to the competitive threats faced by the firm as a robustness check. To compare with the traditional measure of competition, we also test how CDS trading will affect lead market concentration (i.e., *HHI*). We define the *Tradedpost* dummy to be one for observations that occur in the year of CDS initiation or in years thereafter and zero otherwise. This main dummy indicates any firm-year observations with CDS trading. We also included firm and year fixed effects to capture group-wise unobserved time-invariant heterogeneity. Essentially, this is an alternative difference-in-differences model, as in [Bertrand and Mullainathan \(2003\)](#), because we cannot assign a specific date for the treatment (i.e., CDS initiation). Controls include common firm characteristics such as profitability (i.e., *Roa*), market capitalization (i.e., *Size*), dividend payout policy (i.e., *Dividend*), short-term liquidity (i.e., *Cash*), asset value to replacement cost (i.e., *TobinsQ*), and firm debt to equity ratio (i.e., *DEratio*). Appendix A Table A1 provides a comprehensive overview of the construction of all variables used in our analysis. To examine whether the presence of high institutional investors affects a firm's competitive landscape, we estimate the following equations:

$$Competition_{i,t} = \beta_1 Tradedpost_{i,t} + \beta_2 High_Inst_{i,t-1} + \beta_3 High_Inst_{i,t-1} \times Tradedpost_{i,t} + \gamma Controls + Fixed\ Effects + e_{i,t} \quad (2)$$

Model (2) modifies model (1) by adding an indicator of high institutional monitoring (i.e., *High_Inst*) and its interaction with the *Tradedpost* dummy. Unlike smaller retail traders in the secondary market, institutional investors typically need to file Form 13F with the SEC to disclose their respective holdings. We defined the *High_Inst* dummy to be one if a firm has a yearly average institutional ownership above the sample industry median, as it is likely that a certain threshold level of institutional presence may be required for effective involvement. Given that such a threshold may differ across industries, we also repeat the above regression using alternative measures, *High_Inst(SIC2)* and *High_Inst(SIC3)*, which are dummies equal to one if a firm has a yearly average institutional ownership above its own 2- and 3-digit SIC industry median, respectively.

To test our third hypothesis, that CDS initiation may affect the disclosure of mandatory filings (i.e., Form 10-K), we estimate the following linear regression:

$$Readability_{i,t} = \beta_1 Tradedpost_{i,t} + \gamma Controls + Fixed\ Effects + e_{i,t} \quad (3)$$

Following [Li \(2008\)](#), our main readability measure is the Fog Index, which estimates the number of years of education a person needs to understand the text on the first reading. We also include the Flesch–Kincaid index and the natural log of total words in Form 10-K as additional measures for readability. Following our baseline model (1), we include the same set of firm controls and fixed effects. While [Kim et al. \(2018\)](#) have shown that CDS trading increases both the likelihood and frequency of voluntary disclosure, the conclusion might not be equally straightforward regarding 10-K disclosures, according to the proprietary cost hypothesis.

4. Results and Discussion

4.1. Descriptive Statistics

Panel A of Table 1 describes the summary statistics for both our treatment (i.e., CDS-traded firms) and control group (i.e., non-CDS-traded firms). We perform a *t*-test on the difference of means between the two groups and find that CDS-traded firms are statistically different from their non-CDS counterparts in several dimensions, including the competition

faced, report readability, and firm characteristics. The CDS-traded firms are facing less competition but have fewer readable disclosures on average. They are also larger in terms of size, profitability, tangibility, and dividend payouts. However, they seem to be less levered, hold less cash, and have a smaller Tobin's Q ratio. Interestingly, their equity is also held more proportionally by institutional investors. It is, therefore, important to control for such differences in characteristics in our regression models.

Table 1. Descriptive statistics. This table reports the descriptive statistics of our entire sample from 1994 to 2013. Panel A compares the statistics of non-CDS- and CDS-traded firms, whereas panel B compares the statistics of CDS-traded firms in the pre- and post-CDS initiation periods. The differences in means from the *t*-test are marked with ** or *** indicating a significance level of 0.05 or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

Panel A: All Firms		Full Sample		Non-CDS-Traded (a)			CDS-Traded Firms (b)			
	N	Mean	SD.	N	Mean	SD.	N	Mean	SD.	<i>t</i> -Test (a)—(b)
Competition Measures										
Fluidity	51,043	6.660	3.348	46,868	6.722	3.349	4175	5.963	3.260	0.759 ***
Fluidity_Rank	51,043	5.076	2.825	46,868	5.132	2.815	4175	4.447	2.865	0.685 ***
Fluidity_Rank(Year)	51,043	5.006	2.828	46,868	5.062	2.819	4175	4.379	2.847	0.683 ***
Fluidity_Rank(SIC2)	51,043	5.333	2.860	46,868	5.372	2.853	4175	4.893	2.904	0.479 ***
Fluidity_Rank(SIC3)	51,043	5.159	2.866	46,868	5.184	2.865	4175	4.875	2.862	0.309 ***
Pctcomp	26,379	0.574	0.463	23,527	0.596	0.467	2852	0.392	0.380	0.204 ***
HHI	65,762	638.656	547.131	61,063	631.404	539.674	4699	732.896	628.635	−101.492 ***
Linguistic Measures										
FogIndex	41,440	19.343	2.432	37,928	19.331	2.463	3512	19.468	2.059	−0.137 **
Words	41,050	10.062	0.798	37,551	10.031	0.796	3499	10.389	0.745	−0.358 ***
Kincaid	41,440	15.295	2.126	37,928	15.273	2.144	3512	15.530	1.904	−0.257 ***
Net_Tone	65,752	−0.370	0.165	61,053	−0.371	0.165	4699	−0.353	0.161	−0.018 ***
Negative_Tone	65,762	1.543	0.443	61,063	1.543	0.446	4699	1.537	0.413	0.006
Positive_Tone	65,762	0.683	0.176	61,063	0.680	0.176	4699	0.713	0.180	−0.033 ***
Firm Characteristics										
Roa	65,762	−0.389	1.811	61,063	−0.423	1.875	4699	0.049	0.123	−0.472 ***
Size	65,762	4.783	2.612	61,063	4.480	2.436	4699	8.719	1.303	−4.238 ***
Tangibility	65,762	0.251	0.232	61,063	0.244	0.231	4699	0.338	0.233	−0.094 ***
Dividend	65,762	0.342	0.474	61,063	0.310	0.462	4699	0.762	0.426	−0.452 ***
Cash	65,762	0.216	0.248	61,063	0.226	0.253	4699	0.085	0.097	0.141 ***
TobinsQ	65,762	4.738	15.086	61,063	4.959	15.630	4699	1.864	1.163	3.095 ***
DERatio	65,762	1.504	5.045	61,063	1.526	5.163	4699	1.222	3.104	0.304 ***
High_Inst	65,762	0.529	0.499	61,063	0.506	0.500	4699	0.819	0.385	−0.313 ***
High_Inst(SIC2)	65,762	0.510	0.500	61,063	0.489	0.500	4699	0.782	0.413	−0.293 ***
High_Inst(SIC3)	65,762	0.494	0.500	61,063	0.475	0.499	4699	0.739	0.439	−0.264 ***
Panel B: CDS— Traded Firms										
		Before CDS Initiation (a)			After CDS Initiation (b)					
	N	Mean	SD.	N	Mean		SD.		<i>t</i> -Test (a)—(b)	
Competition Measures										
Fluidity	2041	5.965	3.277	2134	5.961		3.245		0.004	
Pctcomp	1948	0.480	0.420	904	0.201		0.151		0.279 ***	
HHI	2505	679.542	582.120	2194	793.814		672.832		−114.272 ***	
Linguistic Measures										
FogIndex	2247	19.284	1.913	1265	19.794		2.259		−0.510 ***	
Words	2239	10.324	0.674	1260	10.505		0.844		−0.181 ***	
Kincaid	2247	15.274	1.776	1265	15.985		2.036		−0.711 ***	
Net_Tone	2505	−0.329	0.178	2194	−0.381		0.134		0.052 ***	
Negative_Tone	2505	1.420	0.418	2194	1.672		0.364		−0.252 ***	
Positive_Tone	2505	0.694	0.191	2194	0.736		0.164		−0.043 ***	
Firm Characteristics										
Roa	2505	0.049	0.153	2194	0.050		0.076		−0.001	
Size	2505	8.284	1.296	2194	9.215		1.121		−0.930 ***	
Tangibility	2505	0.352	0.228	2194	0.322		0.237		0.030 ***	
Dividend	2505	0.739	0.440	2194	0.789		0.409		−0.050 ***	
Cash	2505	0.073	0.101	2194	0.099		0.091		−0.026 ***	
TobinsQ	2505	2.057	1.438	2194	1.644		0.670		0.412 ***	
DERatio	2505	1.004	2.087	2194	1.472		3.944		−0.467 ***	
High_Inst	2505	0.761	0.426	2194	0.885		0.319		−0.124 ***	
High_Inst(SIC2)	2505	0.742	0.438	2194	0.829		0.377		−0.087 ***	
High_Inst(SIC3)	2505	0.714	0.452	2194	0.768		0.423		−0.054 ***	

Panel B of Table 1 illustrates the characteristics of CDS-traded firms before and after the initiation of CDS trading. Interestingly, the preliminary results do not reveal a clear difference between the two groups in the post- and pre-initiation trading periods regarding competitive threats, potentially because of the non-fixed CDS initiation dates. However, firms do seem to produce less-readable 10-K filings on average in the post-initiation period. Also, CDS trading does not directly reveal any significant change in profitability, but firms seem to experience a significant increase in size, dividend payouts, cash holdings, leverage, and institutional presence. We also observe a drop in firm tangibility and Tobin's Q ratio. In Table 2, we also show the distribution of our entire firm-year observations based on the Fama–French 17 industries for both CDS- and Non-CDS-traded firms. The pairwise correlations of all used variables are reported in Appendix A Table A2.

Table 2. Industry classification. This table shows the distribution of our firm-year observations based on the Fama–French 17 industries for both CDS- and Non-CDS-traded firms. Detailed definitions of each industry category can be found in Kenneth French's online data library.⁶

Fama-French 17 Industries	Non-CDS-Traded	CDS-Traded	Total
<i>Food</i>	1830	223	2053
<i>Mining and Minerals</i>	995	70	1065
<i>Oil and Petroleum Product</i>	3010	479	3489
<i>Textiles, Apparel & Footwear</i>	1136	70	1206
<i>Consumer Durables</i>	1729	109	1838
<i>Chemicals</i>	1371	197	1568
<i>Drugs, Soap, Perfumes, Tobacco</i>	3038	292	3330
<i>Construction and Construction Materials</i>	2137	385	2522
<i>Steel Works Etc.</i>	798	105	903
<i>Fabricated Products</i>	530	39	569
<i>Machinery and Business Equipment</i>	9517	666	10,183
<i>Automobiles</i>	982	46	1028
<i>Transportation</i>	2263	382	2645
<i>Retail Stores</i>	3583	304	3887
<i>Other</i>	28,144	1332	29,476
Total	61,063	4699	65,762

4.2. The Impact of CDS Trading on Product Market Competition

4.2.1. The Baseline Results

Our first hypothesis examines whether the initiation of CDS trading increases the competitive threats faced by individual firms. Our main dependent variable is *Fluidity* as constructed in Hoberg et al. (2014), which captures the competition landscape of individual firms. We included common firm controls and two sets of fixed effects to account for firm and year level invariant heterogeneity among our sample. We also perform an identical test on *Pctcomp* as in Li et al. (2013) and traditional 2-digit SIC *HHI* alongside for comparison.⁷

Table 3 reports the regression results for the above three competition measures. Our main variable of interest is *Tradedpost* which indicates whether a firm-year observation occurs during or after the initiation of CDS trading. The coefficients on *Tradedpost* are both positive and statistically significant. Results from columns (1) and (2) imply that, on average, a firm faces a greater competitive threat following CDS initiation. The results are in favor of our first hypothesis, that the initiation of CDS trading increases the competitive threats from rival firms at the individual firm level.⁸ However, when we look at the lead *HHI* index from column (3), the positive coefficients imply that CDS initiation may instead increase market concentration at the industry level. These seemingly contradictory results may be explained by the following arguments: (1) *HHI* captures industry-level competition whereas *Fluidity* and *Pctcomp* capture firm-level competition. (2) CDS trading reveals more strategic or proprietary information at the industry level that drives firms with less core competency out of competition. In other words, it is possible that CDS trading changes the

information environment such that more competitive firms grow and gain larger market shares while facing greater competitive threats from the surviving rivals. Nevertheless, the use of firm-level competitive measures has provided us with valuable but different insights compared to traditional measures like *HHI*.

Table 3. CDS initiations and product market competition. This table reports the results of our baseline regression model (1) for different competition measures. Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and the firm and year fixed effects are included in all specifications. Coefficients with ** or *** indicating a significance level of 0.05 or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)
	<i>Fluidity</i>	<i>Pctcomp</i>	<i>HHI</i>
<i>Tradedpost</i>	0.5447 *** (0.114)	0.0435 ** (0.019)	55.8385 *** (19.336)
<i>Roa</i>	−0.1857 *** (0.028)	0.0355 ** (0.017)	0.3626 (0.668)
<i>Size</i>	0.3818 *** (0.029)	−0.0092 (0.008)	−2.2701 (2.636)
<i>Tangibility</i>	0.5328 *** (0.183)	0.0668 (0.049)	−0.8344 (18.009)
<i>Dividend</i>	−0.0766 ** (0.037)	−0.0108 (0.010)	1.3268 (5.704)
<i>Cash</i>	0.7885 *** (0.110)	0.0416 (0.034)	10.6663 (8.366)
<i>TobinsQ</i>	0.0212 *** (0.004)	0.0097 *** (0.002)	−0.1020 (0.109)
<i>DEratio</i>	0.0036 (0.003)	0.0011 (0.001)	−0.1232 (0.256)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj. R^2	0.81	0.56	0.89
Observations	51,043	26,379	65,762

4.2.2. Addressing Endogeneity—Parallel Trend and Overlap Weight Propensity Score Matching

Endogeneity is always a concern for reduced formed regressions, and the parallel trend assumption is a crucial component of the difference-in-difference approach because it ensures that any observed differences between the treatment and control groups are due to the treatment itself and not other factors that could affect both groups differently over time. To address this concern, we run an alternative version of model (1) by replacing *Tradedpost* with separate dummy variables that indicate the years [$t = -4$ to $t = 6$] relative to the CDS initiation year (i.e., $t = 0$). This specification also permits us to assess the exact timing of when CDS initiation begins to impact competition. The coefficients and their corresponding 95% confidence interval are plotted in Figure 1. The result suggests that CDS trading begins to increase a firm's competition (i.e., *Fluidity*) only after the initiation year.

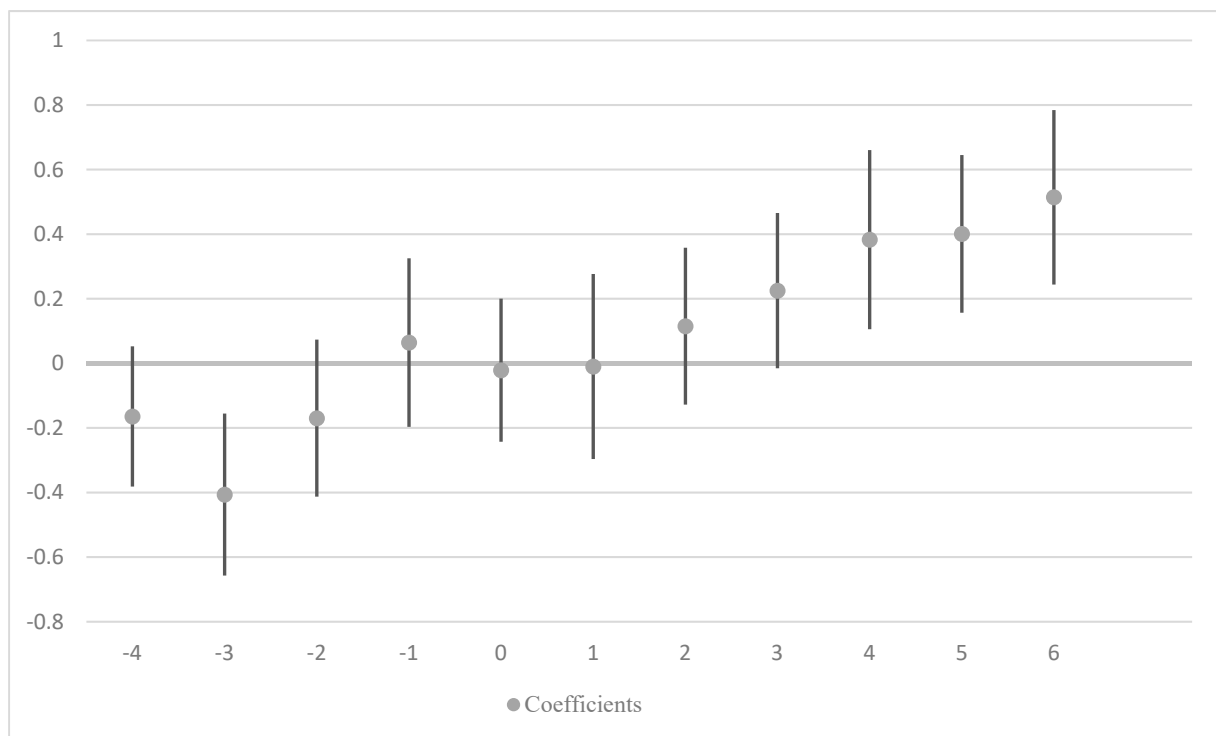


Figure 1. Fluidity surrounding CDS initiation. This figure shows the results of an alternative version of model (1) by replacing *Tradedpost* with separate dummy variables that indicate the years [$t = -4$ to $t = 6$] relative to the CDS initiation year (i.e., $t = 0$). The coefficients and their corresponding 95% confidence interval are plotted.

Alternatively, we also use a special version of propensity score matching to address potential endogeneity concerns due to unobserved firm heterogeneity. As shown in Table 1, the CDS trading firms have very different characteristics relative to the non-CDS firms, which leads to conventional propensity score matching being unable to achieve covariate balance. Li et al. (2018) proposed the use of overlap weights, calculated from propensity scores, to reweight observations such that the exact mean balance of the matching covariates is achieved. We match controls to treatment firms without replacement based on CDS initiation year and several lagged covariates, including Roa, firm size, tangibility, debt-equity ratio, and institutional presence. Once a pair of firms is matched, we include all their firm-year observations and repeat our baseline model (1) with all of the matched samples. We focus on *Fluidity* and its lead measures (i.e., $t + 1$ to $t + 3$), and the results are reported in Table 4. The results once again concur with our first hypothesis that CDS trading increases the competitive threats faced by the firm.

Table 4. Overlap weight propensity score matching. This table reports the results for model (1) with propensity score matched samples using overlap weights approach (Li et al. 2018). Control firms were matched based on CDS initiation year and lagged covariates, including Roa, firm size, tangibility, debt-equity ratio, and institutional presence. The firm-year observations of all matched firms are included in the regressions. Dependent variables include *Fluidity* and its lead measures (i.e., $t + 1$ to $t + 3$). Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)	(4)
	<i>Fluidity</i>	<i>Fluidity</i> ($t + 1$)	<i>Fluidity</i> ($t + 2$)	<i>Fluidity</i> ($t + 3$)
<i>Tradedpost</i>	0.4018 *** (0.143)	0.4047 *** (0.144)	0.3563 ** (0.141)	0.3147 ** (0.140)
<i>Roa</i>	−0.8644 *** (0.286)	−0.4733 ** (0.210)	−0.1770 (0.257)	−0.1619 (0.269)
<i>Size</i>	0.3834 *** (0.091)	0.3105 *** (0.088)	0.2439 *** (0.093)	0.1755 * (0.098)
<i>Tangibility</i>	−0.2326 (0.685)	−0.2856 (0.601)	−0.0185 (0.582)	0.0685 (0.604)
<i>Dividend</i>	−0.2809 ** (0.119)	−0.2089 * (0.115)	−0.2227 * (0.116)	−0.2329 ** (0.115)
<i>Cash</i>	0.7619 (0.598)	0.7803 (0.592)	0.4540 (0.589)	0.3254 (0.569)
<i>TobinsQ</i>	0.0496 *** (0.016)	0.0845 *** (0.018)	0.0836 *** (0.014)	0.0743 *** (0.016)
<i>DEratio</i>	0.0056 (0.007)	−0.0002 (0.005)	−0.0087 ** (0.004)	−0.0154 *** (0.004)
<i>High_Inst</i> (SIC3)	−0.2235 * (0.115)	−0.3166 *** (0.106)	−0.2893 *** (0.102)	−0.2661 *** (0.101)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.77	0.76	0.76	0.77
Observations	7057	7327	6886	6486

4.3. Institutional Presence

Institutional investors hold significant ownership stakes and play a crucial role in firm monitoring (Bathala et al. 1994). To examine whether institutional presence affects a firm's competitive landscape after CDS initiation, we run regression model (2) and report the results in Table 5. In column (1), we include both the *High_Inst* dummy and its interaction with the main independent variable, *Tradedpost*. For robustness, we also include alternative measures of *High_Inst* by additionally restricting the institutional ownership ranking to be within a firm's own industry classification (i.e., 2- and 3-digit SIC) in columns (2) and (3).

Table 5. CDS initiation and institutional holdings. This table reports the results of regression model (2) using our main competition measure, *Fluidity*. Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)
	<i>Fluidity</i>	<i>Fluidity</i>	<i>Fluidity</i>
<i>Tradedpost</i>	0.0879 (0.287)	0.1309 (0.215)	0.2312 (0.170)
<i>High_Inst</i>	−0.2983 *** (0.050)		
<i>Tradedpost * High_Inst</i>	0.5213 * (0.287)		
<i>High_Inst(SIC2)</i>		−0.2683 *** (0.045)	
<i>Tradedpost * High_Inst(SIC2)</i>		0.4960 ** (0.211)	
<i>High_Inst(SIC3)</i>			−0.2157 *** (0.041)
<i>Tradedpost * High_Inst(SIC3)</i>			0.3964 ** (0.170)
<i>Roa</i>	−0.1832 *** (0.028)	−0.1846 *** (0.028)	−0.1852 *** (0.028)
<i>Size</i>	0.3936 *** (0.029)	0.3933 *** (0.029)	0.3912 *** (0.029)
<i>Tangibility</i>	0.5441 *** (0.183)	0.5330 *** (0.183)	0.5333 *** (0.183)
<i>Dividend</i>	−0.0840 ** (0.037)	−0.0824 ** (0.037)	−0.0821 ** (0.037)
<i>Cash</i>	0.7896 *** (0.110)	0.7922 *** (0.110)	0.7900 *** (0.110)
<i>TobinsQ</i>	0.0216 *** (0.004)	0.0214 *** (0.004)	0.0214 *** (0.004)
<i>DEratio</i>	0.0030 (0.003)	0.0031 (0.003)	0.0032 (0.003)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj. R^2	0.81	0.81	0.81
Observations	51,043	51,043	51,043

The results for all three columns yield statistically significant results for the coefficients of both the dummy variable and their interaction terms. The negative coefficients suggest that high institutional presence generally reduces firm-level competition. However, this positive impact seems to be overturned once firms begin trading CDS, as demonstrated by the positive coefficients of the interaction terms. While achieving a causal inference on how institutional presence impacts competition is challenging, our results nonetheless are in favor of hypothesis *H2b*, that the increase in competitive threats due to CDS trading is more pronounced in firms with a higher institutional presence. A potential explanation for this observation is that institutional investors may take on some of the monitoring roles from credit-hedged lenders, causing a decrease in information demand from other general investors (Bushee 1998; Hartzell and Starks 2003). However, being major shareholders with significant ownership stakes, they might indeed be the most demanding of additional disclosures from the firm, leading to greater disclosure of strategic proprietary information to competitors (e.g., Healy et al. 1999; Core 2001; Boone and White 2015; Bird and Karolyi 2016).

4.4. Information Channels

Arguably, managers can strategically utilize linguistic features of the annual report to alter the costs of information processing for the market. To examine our third hypothesis, we employed three common readability measures to test whether managers show signs of using linguistic tools to respond strategically to potential changes in both the information and the competition environment. A higher readability index indicates a greater difficulty in understanding the documents and hence a higher information processing cost. The results for our model (3) are reported in Table 6. We find unanimous statistically positive associations between CDS initiation and all three measures, implying that the readability of annual 10-K filings is negatively correlated with CDS trading. This finding is in favor of hypothesis *H3b*, that the initiation of CDS trading decreases the readability of qualitative disclosure. Arguably, the managers may choose to strategically offset greater voluntary disclosure by making other qualitative disclosure (e.g., 10-Ks) less transparent when CDS initiation changes the competitive landscape surrounding the firm.

Table 6. CDS initiation and 10-K readability. This table reports the results of regression model (3) using our three main readability measures for a firm's 10-K filings. Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)
	<i>FogIndex</i>	<i>Kincaid</i>	<i>Words</i>
<i>Tradedpost</i>	0.5712 *** (0.100)	0.5458 *** (0.094)	0.1208 *** (0.031)
<i>Roa</i>	0.0155 (0.035)	0.0148 (0.029)	−0.0291 *** (0.008)
<i>Size</i>	0.0647 * (0.033)	0.0712 ** (0.029)	0.1041 *** (0.007)
<i>Tangibility</i>	0.0036 (0.233)	0.0297 (0.198)	−0.0655 (0.055)
<i>Dividend</i>	0.0801 (0.054)	0.0745 (0.046)	0.0241 * (0.013)
<i>Cash</i>	0.0676 (0.134)	0.0624 (0.114)	−0.0188 (0.033)
<i>TobinsQ</i>	0.0010 (0.006)	0.0012 (0.005)	0.0013 (0.001)
<i>DEratio</i>	0.0044 (0.004)	0.0029 (0.003)	0.0030 *** (0.001)
<i>High_Inst(SIC3)</i>	0.0729 (0.056)	0.0498 (0.048)	−0.0353 *** (0.013)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj. R^2	0.21	0.24	0.38
Observations	41,440	41,440	41,050

We also investigate whether the presence of institutional investors affects the sentiments of 10-K filings. Recent research in accounting and finance has paid huge attention to the linguistic features of qualitative disclosures. A common method to extract information from qualitative disclosure is the bag-of-words approach that utilizes word lists that have been specifically tailored for financial text. Loughran and McDonald (2011) extensively study the word usage in a large sample of 10-K filings from 1994 to 2008 and develop several word lists to reflect different sentiments in a business context. We follow their approach to construct the tones of 10-K filings for our samples. We first construct *Positive_Tone* (*Negative_Tone*) to measure the percentage occurrence of words from the positive (negative) wordlist as defined in Loughran and McDonald (2011). *Net_Tone* measures the

overall net managerial sentiments of all of the 10-K filings.⁹ We then repeat model (3) by replacing readability measures with tone measures, and the results are presented in Table 7. Interestingly, firms seem to reveal more positive news after CDS begins to trade, as shown by the significantly positive coefficients of *Tradedpost* in columns (1) and (3). Firms do not seem to reveal more negative news after CDS initiation. Arguably, positive news is often related to a firm's strategic information, which may partially explain why competition threat increases for firms after CDS initiation.

Table 7. CDS initiation and 10-K tones. This table reports the results for an alternative version of model (3) using tone measures for a firm's 10-K filings. Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)
	<i>Net_Tone</i>	<i>Negative_Tone</i>	<i>Positive_Tone</i>
<i>Tradedpost</i>	0.0144 * (0.007)	0.0241 (0.018)	0.0305 *** (0.008)
<i>Roa</i>	0.0038 *** (0.001)	−0.0123 *** (0.002)	0.0009 (0.001)
<i>Size</i>	−0.0095 *** (0.001)	0.0289 *** (0.003)	−0.0012 (0.001)
<i>Tangibility</i>	−0.0048 (0.008)	0.0065 (0.022)	0.0009 (0.008)
<i>Dividend</i>	−0.0022 (0.002)	−0.0182 *** (0.006)	−0.0097 *** (0.002)
<i>Cash</i>	0.0108 ** (0.005)	0.0326 ** (0.014)	0.0331 *** (0.005)
<i>TobinsQ</i>	0.0002 ** (0.000)	−0.0007 *** (0.000)	0.0001 (0.000)
<i>DERatio</i>	−0.0013 *** (0.000)	0.0052 *** (0.000)	−0.0002 (0.000)
<i>High_Inst(SIC3)</i>	0.0055 ** (0.003)	−0.0084 (0.007)	0.0006 (0.003)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj. R ²	0.47	0.52	0.59
Observations	65,752	65,762	65,762

As discussed, prior literature has well documented the influence of institutional presence on information disclosure. It is, therefore, also potentially interesting to look at how firms conduct mandatory disclosure (i.e., 10-K filings) under high institutional presence after CDS initiation. We essentially interact *High_Inst(SIC3)* with *Tradedpost* for all our readability and tone measures from Tables 6 and 7. The results are tabulated in Table 8. Interestingly, we observed some evidence regarding the influence from institutional presence after CDS initiation. The coefficients of the interaction terms in columns (1) and (2) suggest that firms on average report 10-Ks using a more positive net tone and a less negative tone after CDS initiation in the presence of high institutional holdings. There is also some evidence from column (4) that the presence of institutional investors might have induced firms to improve readability after CDS trading, which is consistent with our *H2b* that institutional investors demand additional disclosure after CDS initiation and potentially explains the results in Table 5.

Table 8. Disclosure under high institutional ownership. This table reassesses the results from Tables 6 and 7 after including institutional presence (i.e., *High_Inst(SIC3)*). Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Net_Tone</i>	<i>Negative_Tone</i>	<i>Positive_Tone</i>	<i>FogIndex</i>	<i>Kincaid</i>	<i>Words</i>
<i>Tradedpost</i>	−0.0052 (0.014)	0.0672 ** (0.029)	0.0139 (0.016)	0.9212 *** (0.196)	0.7783 *** (0.184)	0.1901 *** (0.051)
<i>Tradedpost</i> * <i>High_Inst(SIC3)</i>	0.0256 * (0.013)	−0.0562 * (0.029)	0.0215 (0.016)	−0.4520 ** (0.202)	−0.3003 (0.188)	−0.0895 (0.055)
<i>High_Inst(SIC3)</i>	0.0045 * (0.003)	−0.0062 (0.007)	−0.0002 (0.003)	0.0872 (0.057)	0.0594 (0.048)	−0.0325 ** (0.014)
<i>Roa</i>	0.0038 *** (0.001)	−0.0123 *** (0.002)	0.0009 (0.001)	0.0155 (0.035)	0.0148 (0.029)	−0.0291 *** (0.008)
<i>Size</i>	−0.0095 *** (0.001)	0.0288 *** (0.003)	−0.0012 (0.001)	0.0644 * (0.033)	0.0711 ** (0.029)	0.1041 *** (0.007)
<i>Tangibility</i>	−0.0047 (0.008)	0.0063 (0.022)	0.0010 (0.008)	0.0025 (0.233)	0.0290 (0.198)	−0.0657 (0.055)
<i>Dividend</i>	−0.0023 (0.002)	−0.0180 *** (0.006)	−0.0098 *** (0.002)	0.0812 (0.054)	0.0753 (0.046)	0.0244 * (0.013)
<i>Cash</i>	0.0108 ** (0.005)	0.0325 ** (0.014)	0.0331 *** (0.005)	0.0666 (0.134)	0.0618 (0.114)	−0.0190 (0.033)
<i>TobinsQ</i>	0.0002 ** (0.000)	−0.0007 *** (0.000)	0.0001 (0.000)	0.0010 (0.006)	0.0012 (0.005)	0.0013 (0.001)
<i>DEratio</i>	−0.0013 *** (0.000)	0.0052 *** (0.000)	−0.0002 (0.000)	0.0043 (0.004)	0.0028 (0.003)	0.0029 *** (0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.47	0.52	0.59	0.21	0.24	0.38
Observations	65,752	65,762	65,762	41,440	41,440	41,050

5. Conclusions

Our paper examines how the initiation of CDS trading affects the competitive landscape of the referenced firms in the US. Undeniably, the innovation of CDS has many beneficial effects for debt investors, including the valuable ability to transfer credit risks without altering the ownership of bonds. However, hedging credit risk through CDS inevitably leads to disincentives for creditors to monitor the firms, which in turn spurs higher demand for information disclosure by the equity holders due to concerns over growing principal-agent problems.

Our study first shows that the initiation of CDS trading can intensify a firm's forward-looking competitive threats in its product market, potentially due to heightened investor demand for information disclosure. Interestingly, instead of increasing voluntary disclosure, as found in prior literature, we observe that the managers decrease the readability of the annual 10-K reports, potentially as an approach to offset the over-disclosure of strategic information to escape competition. However, in the presence of high institutional holdings, we find that the positive substitutional effect from institutional monitoring appears to be overshadowed entirely by the even greater demand for additional disclosure ascribed to their substantial ownership stakes.

In essence, our study brings to the fore the explicit evidential relation between firm-level product market competition and the CDS trading pertaining to the referenced firms, which has not been documented previously in the literature. Our findings also complement the broader literature that examines the general impact of CDS trading on the information environment of financial markets, which provides potentially valuable policy implications

for financial market regulation relating to the information disclosure mechanisms of firms when faced with reduced creditor monitoring.

Author Contributions: Conceptualization, C.H., M.L. and W.J.; Methodology, C.H. and W.J.; Software, C.H. and W.J.; Validation, C.H., M.L. and W.J.; Formal Analysis, C.H. and W.J.; Investigation, C.H. and W.J.; Resources, C.H. and W.J.; Data Curation, C.H. and W.J.; Writing—Original Draft Preparation, C.H.; Writing—Review & Editing, C.H., M.L. and W.J.; Visualization, C.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no funding.

Data Availability Statement: This study utilizes both subscription-based and publicly available databases and all data sources were presented in the paper under Section 3. Materials and Methods.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Variable Definitions.

Variable	Description
<i>Tradedpost</i>	<i>Tradedpost</i> dummy equals one for observations that occur in the year of CDS initiation or in years thereafter, and zero otherwise.
Competition Measures	
<i>Fluidity</i>	A textual based firm-level measure for competitive threat as in Hoberg et al. (2014)
<i>Fluidity_Rank</i>	<i>Fluidity_Rank</i> is constructed by assigning to firms the decile rank of their <i>Fluidity</i> in the whole sample, with 1 being in the lowest <i>Fluidity</i> decile and 10 being the highest.
<i>Fluidity_Rank</i> (Year)	<i>Fluidity_Rank</i> is constructed by assigning to firms the decile rank of their <i>Fluidity</i> within each fiscal year, with 1 being in the lowest <i>Fluidity</i> decile and 10 being in the highest.
<i>Fluidity_Rank</i> (SIC2)	<i>Fluidity_Rank</i> (SIC2) is constructed by assigning to firms the decile rank of their <i>Fluidity</i> within each 2-digit SIC and fiscal year, with 1 being in the lowest <i>Fluidity</i> decile and 10 being in the highest.
<i>Fluidity_Rank</i> (SIC3)	<i>Fluidity_Rank</i> (SIC3) is constructed by assigning to firms the decile rank of their <i>Fluidity</i> within each 3-digit SIC and fiscal year, with 1 being in the lowest <i>Fluidity</i> decile and 10 being in the highest.
<i>Pctcomp</i>	A textual-based firm-level measure for competitive threat as in Li et al. (2013) .
<i>HHI</i>	Herfindahl-Hirschman Index is calculated based on the lead annual sales data from the Compustat database for each 2-digit SIC.
Linguistic Measures	
<i>FogIndex</i>	Fog Index measured as $0.4 \times [(\text{total number of words}/\text{total number of sentences}) + 100 \times (\text{complex words}/\text{total number of words})]$ where complex words are defined as words with three syllables or more
<i>Words</i>	Natural log of the number of words in Form 10-K
<i>Kincaid</i>	Flesch–Kincaid grade level measured as $0.39 \times (\text{total words}/\text{total sentences}) + 11.8 \times (\text{total syllables}/\text{total words}) - 15.59$
<i>Net_Tone</i>	<i>Net_Tone</i> is measured by taking the difference between the positive and negative words as defined in Loughran and McDonald (2011) divided by the total number of positive and negative words.
<i>Negative_Tone</i>	The total number of negative words, as defined in Loughran and McDonald (2011) , divided by the total words from Form 10-K multiplied by 100.
<i>Positive_Tone</i>	The total number of positive words, as defined in Loughran and McDonald (2011) , divided by the total words from Form 10-K multiplied by 100.
Firm Characteristics	
<i>Roa</i>	Income before extraordinary item normalized by total assets
<i>Size</i>	Natural log of total assets
<i>Tangibility</i>	Property, plant, and equipment normalized by total assets
<i>Dividend</i>	A dummy equals to one if a firm pays out a positive dividend in year <i>t</i>
<i>Cash</i>	Cash and cash equivalent normalized by total assets
<i>TobinsQ</i>	Tobin's Q ratio is calculated as $(\text{Total asset} + \text{Market Value of Equity} - \text{Book Value of Equity})/\text{Total Assets}$
<i>DEratio</i>	Total debt over total common equity value
<i>High_Inst</i>	A dummy equal to one if the average institutional ownership in a particular year, as disclosed in Form 13F, is higher than the sample median.
<i>High_Inst</i> (SIC2)	A dummy equal to one if the average institutional ownership in a particular 2-digit SIC and year, as disclosed in Form 13F, is higher than the sample median.
<i>High_Inst</i> (SIC3)	A dummy equal to one if the average institutional ownership in a particular 3-digit SIC and year, as disclosed in Form 13F, is higher than the sample median.

Table A2. Variable pairwise correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1) <i>Fluidity</i>	1.00																						
(2) <i>Fluidity_Rank</i>	0.96	1.00																					
(3) <i>Fluidity_Rank(Year)</i>	0.95	0.98	1.00																				
(4) <i>Fluidity_Rank(SIC2)</i>	0.73	0.76	0.77	1.00																			
(5) <i>Fluidity_Rank(SIC3)</i>	0.65	0.66	0.67	0.86	1.00																		
(6) <i>Pctcomp</i>	0.14	0.15	0.15	0.12	0.10	1.00																	
(7) <i>HHI</i>	−0.20	−0.20	−0.20	−0.03	−0.05	−0.11	1.00																
(8) <i>FogIndex</i>	0.13	0.14	0.14	0.11	0.09	−0.10	−0.03	1.00															
(9) <i>Words</i>	0.24	0.24	0.25	0.21	0.19	−0.23	−0.03	0.29	1.00														
(10) <i>Kincaid</i>	0.16	0.16	0.16	0.13	0.11	−0.15	−0.05	0.98	0.33	1.00													
(11) <i>Net_Tone</i>	−0.06	−0.08	−0.08	−0.05	−0.03	0.24	−0.04	−0.11	−0.29	−0.13	1.00												
(12) <i>Negative_Tone</i>	0.22	0.23	0.23	0.20	0.16	−0.17	−0.04	0.12	0.33	0.17	−0.73	1.00											
(13) <i>Positive_Tone</i>	0.20	0.17	0.17	0.17	0.16	0.14	−0.11	−0.01	−0.01	0.02	0.58	0.08	1.00										
(14) <i>Roa</i>	−0.19	−0.18	−0.19	−0.11	−0.08	−0.02	0.03	0.03	−0.01	0.03	0.03	−0.03	−0.01	1.00									
(15) <i>Size</i>	−0.06	−0.07	−0.07	0.01	0.04	−0.26	0.08	0.04	0.28	0.07	−0.03	0.11	0.08	0.46	1.00								
(16) <i>Tangibility</i>	−0.04	−0.04	−0.04	−0.05	−0.03	−0.11	0.18	−0.04	0.03	−0.06	−0.03	−0.13	−0.19	0.05	0.20	1.00							
(17) <i>Dividend</i>	−0.17	−0.18	−0.18	−0.15	−0.11	−0.14	0.06	−0.03	0.02	−0.04	0.08	−0.12	−0.03	0.11	0.34	0.16	1.00						
(18) <i>Cash</i>	0.41	0.38	0.39	0.25	0.19	0.17	−0.18	0.06	0.00	0.09	0.02	0.17	0.24	−0.11	−0.27	−0.41	−0.20	1.00					
(19) <i>TobinsQ</i>	0.17	0.17	0.17	0.10	0.08	0.12	−0.02	−0.03	−0.01	−0.02	0.00	−0.01	0.01	−0.74	−0.43	−0.07	−0.10	0.16	1.00				
(20) <i>DERatio</i>	−0.04	−0.03	−0.04	0.00	0.01	−0.07	0.07	0.01	0.06	0.00	−0.10	0.07	−0.08	−0.04	0.01	0.09	−0.00	−0.13	−0.00	1.00			
(21) <i>High_Inst</i>	−0.09	−0.09	−0.10	−0.03	−0.01	−0.04	0.03	0.01	0.02	0.03	0.05	0.04	0.11	0.22	0.49	0.05	0.14	−0.08	−0.18	−0.10	1.00		
(22) <i>High_Inst(SIC2)</i>	−0.04	−0.04	−0.04	−0.03	−0.00	−0.05	−0.01	0.02	0.04	0.03	0.03	0.04	0.10	0.20	0.45	0.05	0.13	−0.04	−0.16	−0.10	0.86	1.00	
(23) <i>High_Inst(SIC3)</i>	−0.00	−0.00	−0.01	−0.00	0.01	−0.04	−0.02	0.03	0.04	0.04	0.03	0.05	0.10	0.19	0.41	0.04	0.11	−0.02	−0.15	−0.10	0.80	0.87	1.00

Table A3. CDS initiations and fluidity ranks. This table reports the results of regression model (1) for alternative versions of *Fluidity* measures, which were ranked by deciles from each year and by industry classifications. Standard errors were clustered by firms and reported in parentheses. Lagged firm-specific controls and the firm and year fixed effects are included in all specifications. Coefficients with *, **, or *** indicate a significance level of 0.10, 0.05, or 0.01, respectively. For detailed definitions of variables, please refer to Appendix A Table A1.

	(1)	(2)	(3)	(4)
	<i>Fluidity_Rank</i>	<i>Fluidity_Rank(Year)</i>	<i>Fluidity_Rank(SIC2)</i>	<i>Fluidity_Rank(SIC3)</i>
<i>Tradedpost</i>	0.5281 *** (0.093)	0.5114 *** (0.093)	0.3408 *** (0.117)	0.3397 *** (0.125)
<i>Roa</i>	−0.1633 *** (0.024)	−0.1591 *** (0.024)	−0.0914 *** (0.028)	−0.0915 *** (0.030)
<i>Size</i>	0.3047 *** (0.024)	0.3063 *** (0.025)	0.2436 *** (0.031)	0.2623 *** (0.033)
<i>Tangibility</i>	0.6053 *** (0.160)	0.5816 *** (0.163)	0.3395 * (0.183)	0.4329 ** (0.200)
<i>Dividend</i>	−0.0505 (0.032)	−0.0369 (0.033)	−0.0383 (0.041)	−0.0153 (0.045)
<i>Cash</i>	0.6380 *** (0.093)	0.6471 *** (0.095)	0.4909 *** (0.106)	0.4479 *** (0.115)
<i>TobinsQ</i>	0.0180 *** (0.004)	0.0187 *** (0.004)	0.0130 *** (0.004)	0.0129 *** (0.004)
<i>DERatio</i>	0.0035 (0.003)	0.0041 (0.003)	0.0107 *** (0.004)	0.0132 *** (0.004)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj. R ²	0.80	0.80	0.69	0.62
Observations	51,043	51,043	51,043	51,043

Notes

- See Core (2001) for a brief discussion of the literature on firm disclosure in the presence of institutional investors.
- A tension exists between the two forces, which are not mutually exclusive. Therefore, the empirical testing of the above competing hypotheses is a joint test that may only reveal which of the two forces dominates.
- Five-year is the most common maturity of CDS contracts. See Landsman et al. (2023).
- The data for *Pctcomp* was retrieved from Feng Li's website (<http://webuser.bus.umich.edu/feng/>, accessed on 20 February 2020).
- Please note that some observations from our final sample will be dropped depending on the exact specification of our regression models.
- See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library/det_17_ind_port.html, accessed on 29 August 2022.

- 7 There are two important reasons for using *Fluidity* as our main measures. First, we believe that the construction of *Fluidity* fits the definition of product market competition better. Second, we will be able to retain more observations using *Fluidity*.
- 8 To ensure the robustness of our results, we follow Li and Zhan (2018) by creating alternative *Fluidity* measures and repeat our model (1). We construct *Fluidity_Rank* by assigning firms to the decile rank of their *Fluidity* within each year, with 1 being in the lowest *Fluidity* decile and 10 being in the highest. We also further refine our ranking approach by including industry classifications (i.e., *Fluidity_Rank*(SIC2) and *Fluidity_Rank*(SIC3)). The results are reported in Appendix A Table A3, which yield unanimously similar results in comparison to those in Table 3.
- 9 Please see Appendix A Table A1 for detailed definition of the tone variables.

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