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CDS Trading Initiation, Information Asymmetry, and Dividend Payout

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Abstract. This study uses an information-asymmetry framework to examine the effect of initiation of credit default swaps (CDS) trading on firm dividend payout policy. We find evidence that CDS initiation is associated with increasing dividends, which is consistent with firms distributing excess free cash flow to mitigate exacerbated manager-equityholder agency conflicts resulting from reduced monitoring by banks following CDS initiation. Additional findings support this explanation by showing that the dividend increases are concentrated among borrowing firms with higher agency cost before CDS initiation, among firms whose lead arranger banks have a relatively less strong reputation in the loan-syndication market, and among firms whose loans are subject to less intense monitoring features—that is, less restrictive loan covenants—following CDS initiation. Additional analyses also suggest that inferences are robust to controlling for the potential effects of CDS initiation on capital structure.

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Keywords: CDS trading • dividend payout • agency costs

1. Introduction

Dividend payout policy is a central corporate financial decision that is affected by asymmetric information between managers and equityholders. Information asymmetry between the firm's managers and providers of equity capital causes managers to trade off between retaining free cash flow to fund investments and paying out free cash flow to mitigate agency conflicts between managers and equity capital providers (DeAngelo et al. 2008). Although prior research suggests that the initiation of credit default swaps (CDS) trading can have substantial effects on financial markets and corporate financial decisions, there is no evidence on the extent to which CDS trading affects dividend policy. Using the free cash flow-centric theoretical framework of dividend policy (DeAngelo et al. 2008), this study examines how the initiation of CDS trading affects dividend payout policy.

In this framework, information asymmetry between the firm's managers and equity capital providers causes managers to face a time-varying tradeoff between retaining free cash flow to fund investments and paying out free cash flow to address equityholders' concern with overinvestment by managers. Specifically, on the one hand, information asymmetry results in a pecking order, whereby internally generated cash flow is a less costly source of funding than external capital. As a result, other things equal, managers have an incentive to refrain from paying dividends. On the other hand, information asymmetry results in a classic agency problem, whereby equityholders are concerned with overinvestment by managers. The potential for overinvestment arises from the firm having excess free cash flow. As a result, managers have an incentive to pay out excess free cash flow through dividends as a commitment tool to reduce this overinvestment concern (Jensen 1986), thereby enabling them to access the capital markets in the future.

CDS-trading initiation can affect the tension between the pecking-order incentive to retain internally generated free cash flow and the agency-cost incentive to pay it out as dividends. Prior research shows that initiation of CDS trading creates incentives for lenders to reduce monitoring of borrowers (e.g., Morrison 2005, Amiram et al. 2017, and Kim et al. 2018). On the one hand, reduced monitoring can increase the cost of external financing, thereby creating a more severe pecking-order problem. For example, reduced monitoring by lead arranger banks can increase information asymmetry in the loan syndicate, which results in higher loan spread (Amiram et al. 2017). Hence, the more severe pecking-order problem increases managers' incentive to retain free cash flow, which can lead firms to decrease dividends following CDS initiation.

On the other hand, reduced monitoring by lenders can increase agency costs between managers and equityholders, thereby increasing managers' incentive to pay out free cash flow. Prior research suggests that equityholders can benefit from bank lenders' monitoring activities (e.g., James 1987, Lummer and McConnell 1989, and Harvey et al. 2004), which can help mitigate equityholders' concern that managers overinvest. Following CDS-trading initiation, equityholders are less able to rely on bank lenders to monitor managers' activities, thereby exacerbating equityholders' concern that managers overinvest, which increases agency conflicts between managers and equityholders. To address this increased agency-cost problem, managers have a greater incentive to pay out free cash flow as a commitment not to overinvest. The resulting greater incentive for managers to pay out free cash flow can lead firms to increase dividends following CDS initiation.

Hence, the effect of reduced monitoring of borrowers' activities following CDS-trading initiation can decrease dividends through the pecking-order channel or increase dividends through the "agency cost" channel. It is an empirical matter whether the net effect of these two channels results in an increase or decrease in dividends following CDS-trading initiation.[1]

To examine empirically the effect of CDS initiation on dividend policy, we obtain CDS market information from IHS Markit and accounting and financial information from Compustat and the Center for Research in Security Prices (CRSP). The resulting sample comprises 72,741 firm-years, which span 1990–2014, and includes 644 and 6,069 unique firms with and without CDS trading (12,175 and 60,566 firm-years). We conduct our tests using essentially a difference-in-differences research design that follows Bertrand and Mullainathan (2003) that controls for firm and time fixed effects. In all tests, we also include as controls firm-specific characteristics. We find that CDS initiation is associated with firms increasing dividends following CDS initiation, with an average increase of $0.07 per share, representing a 22% increase.

A research design problem common to studies on CDS initiation is that CDS initiation is possibly endogenously related to a change in some other unobservable time-varying firm characteristics. To address this possibility, following prior literature, we test for changes in dividends following CDS initiation using several approaches, including a propensity score matching, "overlap weighting" matching (Li et al. 2018), and an instrumental variables approach. As with the tests based on the full sample of firms, findings from each of these tests reveal evidence that firms increase dividends following CDS initiation. Because we base our tests on a difference-in-differences research design, we conduct an additional analysis that provides support for the parallel trends assumption. In addition, limiting the sample to observations immediately before and after CDS initiation results in the same inferences as those based on the full sample. To further increase our confidence that the increase in dividends following CDS initiation is not attributable to other unobservable time-varying firm characteristics, we also conduct additional tests that reveal that the effect of CDS initiation on dividend policy is greater for firms with a more liquid CDS market.

Because prior literature finds that CDS initiation can affect capital structure, we conduct two additional tests to mitigate the concern that our finding of an increase in dividends following CDS initiation is attributable to CDS initiation being correlated with the extent of a change in firm's debt structure. We do this by permitting bank debt and nonbank debt leverage to have different effects on dividends and by conducting our analysis of dividend payout in a simultaneous equations framework, in which capital structure and dividend payout are jointly determined. Findings from both approaches reveal that our main inferences regarding dividend increases following CDS initiation remain the same.

Finding that dividends increase following CDS initiation is consistent with reduced monitoring increasing agency costs. That is, firms distribute excess free cash flow to mitigate exacerbated agency costs resulting from reduced monitoring by lenders following CDS initiation. We conduct three tests that support this explanation. First, we find that firms with relatively higher free cash flow—that is, higher agency costs—before CDS initiation increase dividends more than firms with relatively lower free cash flow. Second, we find that dividend increases are concentrated among firms whose lead arranger banks have a less strong reputation in the loan-syndication market and, therefore, a less strong incentive to continue to monitor borrowers following CDS initiation. Third, we find that dividend increases are smaller among CDS-traded firms whose pre-existing loans have more restrictive financial covenants, which allows lenders to continue to monitor their activities following CDS initiation.

This study makes two contributions. First, our study extends the literature that examines the effects of credit derivatives on the financial markets and corporate financial reporting and disclosure practices (e.g., Ashcraft and Santos 2009, Saretto and Tookes 2013, Subrahmanyam et al. 2014, Martin and Roychowdhury 2015, Amiram et al. 2017, Danis 2017, Subrahmanyam et al. 2017, Kim et al. 2018, and Shan et al. 2019). In particular, our study is the first to provide evidence that CDS-trading initiation affects firm dividend payout. Second, we contribute to the policy debate on the costs and benefits of CDS by showing that CDS trading creates a negative externality that reduces lenders' incentive to monitor borrowers, which results in firms having to increase dividend payout to mitigate the higher agency costs associated with reduced monitoring. Thus, our study's findings shed light on how the introduction of new hedging products such as CDS could affect corporate decision making.

The remainder of the paper is organized as follows. Section 2 discusses the related literature and develops our predictions. Section 3 outlines our empirical design, Section 4 describes the data and sample, Section 5 presents the results, and Section 6 summarizes and concludes the study.

2. Related Literature and Predictions

A credit default swap is essentially an insurance contract that pays its holders the face value in case of a reference entity (i.e., borrower) credit event (e.g., debt default) in return for a premium. The CDS contract typically requires the buyer of the CDS to make a series of payments to the seller throughout the life of the debt, and, in exchange, the buyer receives a payoff if the debt defaults. CDSs, which were first issued in the early 1990s and reached a peak of $62.2 trillion of notional outstanding value in 2007 (ISDA 2010), were a major financial innovation that allows creditors to hedge credit risk.

Although the development of CDS markets had substantial benefits for creditors, the sheer size of the markets created a debate among practitioners and financial market regulators regarding the potential costs and benefits to financial markets and the greater economy.[2] The ensuing policy debate created an interest among academic researchers to investigate the potential effects of CDS on the economy, including asset prices, the debtor-creditor relationship, corporate financial policy, and other firm characteristics. Findings from this research suggest that the introduction of CDS trading has substantial effects on financial markets and corporate financial decisions. For example, Saretto and Tookes (2013) finds that CDS trading increases leverage because lenders have greater opportunities to hedge risks. However, the ability to hedge credit risk more easily also can increase the bankruptcy risk of borrowers because lenders have less incentive to renegotiate loan contracts when borrowers are in default (Subrahmanyam et al. 2014), which, in turn, creates incentives for borrowers to increase cash holdings (Subrahmanyam et al. 2017). The ability to hedge credit risks also reduces lenders' incentive to monitor borrowers' activities (e.g., Morrison 2005, Amiram et al. 2017, and Kim et al. 2018). Other studies suggest that CDS trading provides new information not just to credit markets, but also to equity markets (e.g., Acharya and Johnson 2007, Ashcraft and Santos 2009, Lee et al. 2018).

A key corporate decision that CDS trading also could affect is dividend payout policy. To understand the potential economic effects of CDS trading on dividend payout policy, we utilize the DeAngelo et al. (2008) information-asymmetry framework. Under this framework, information asymmetry between firm managers and providers of equity capital causes managers to face a tradeoff between retaining free cash flow to fund investments and paying out free cash flow to address equityholders' concern with overinvestment by managers. On the one hand, as a result of information asymmetry between managers and providers of capital providers, raising external capital is costly because capital providers charge an information risk premium. This, in turn, results in a pecking order, whereby internally generated cash flow is a less costly source of funding than external capital (Myers and Majluf 1984). In this situation, other things equal, managers have an incentive to refrain from paying dividends.

On the other hand, information asymmetry between firm managers and providers of equity capital results in a classic agency problem, whereby equityholders are concerned with overinvestment by managers. The potential for overinvestment arises from the firm having excess "free cash flow." As a result, managers have an incentive to pay out excess free cash flow through dividends as a commitment tool to reduce this overinvestment problem (Jensen 1986), thereby enabling them to access the capital markets in the future.[3] Hence, in the DeAngelo et al. (2008) framework, there is a tension between the pecking-order incentive to retain internally generated free cash flow and the agency cost incentive to pay it out as dividends.

As noted above, the initiation of CDS trading reduces lenders' incentive to monitor borrowers following the CDS initiation, which, in turn, can affect the tension between the pecking-order incentive to retain internally generated free cash flow and the agency-cost incentive to pay it out as dividends. On the one hand, reduced monitoring can increase the cost of external financing, thereby creating a more severe pecking-order problem. For example, reduced monitoring by lead arranger banks can increase information asymmetry in the loan syndicate, which results in higher loan spread (Amiram et al. 2017). Hence, the more severe pecking-order problem increases managers' incentive to retain free cash flow, which can lead firms to decrease dividends following CDS initiation.

On the other hand, reduced monitoring can increase agency costs between managers and equityholders, thereby increasing managers' incentive to pay out free cash flow. Banks play an important role in screening and monitoring borrowers. Although such monitoring benefits creditors, prior research suggests that equityholders can also benefit from such monitoring activities.[4] As a result, bank monitoring can help minimize equityholders' concern that managers overinvest. With reduced monitoring following CDS initiation, holding everything else constant, equityholders are less able to rely on bank lenders to monitor managers' activities, thereby increasing agency conflicts between managers and equityholders. The increase in agency conflicts following CDS initiation exacerbates equityholders' concern that managers overinvest as a result of excess free cash flow. To address this problem, managers have a greater incentive to pay out free cash flow as a commitment not to overinvest. The resulting greater incentive for managers to pay out free cash flow leads to the prediction that firms increase dividends following CDS initiation.

In summary, the effect of reduced monitoring of borrowers' activities following CDS initiation can decrease dividends through the pecking-order channel or increase dividends through the agency-cost channel. It is an empirical matter whether the net effect of these two channels results in an increase or decrease in dividends following CDS initiation.

As noted above, the development of the CDS market also can provide new information to capital providers. This new information revelation is another reason why CDS initiation can affect the tension between the pecking-order and agency-cost incentives to pay out dividends. Banks typically have access to private information during their lending relationship with borrowers (e.g., James 1987 and Carrizosa and Ryan 2017). As a result, in CDS markets where banks are active players, CDS prices are a potentially important source of new information about firms, including information about firms' creditworthiness (e.g., Acharya and Johnson 2007, Ashcraft and Santos 2009, and Lee et al. 2018).[5] Consistent with this, Acharya and Johnson (2007) finds that information flows from the CDS market to the equity market, especially for firms with a greater number of bank lenders and during times of financial difficulty.

The revelation of new information about firms through CDS prices potentially can create incentives for management to increase dividends through the pecking-order channel or decrease dividends through the agency-cost channel. On the one hand, the new information provided by CDS trading likely reduces information asymmetry between managers and external capital providers. Holding other things constant, particularly agency costs and bank monitoring, raising external equity capital likely is less costly following CDS initiation, which results in a less severe pecking-order problem. The resulting reduced incentive for managers to retain free cash flow leads firms to increase dividends following CDS initiation. On the other hand, the reduced information asymmetry between managers and equity capital providers that results from CDS trading likely also reduces agency costs. Because the resulting increase in transparency makes it less costly for equityholders to detect and penalize opportunistic managerial behavior, equityholders have less concern that managers will overinvest (DeAngelo et al. 2008). Thus, holding everything else constant, lower information asymmetry results in there being less pressure on managers to precommit to paying out free cash flow as dividends (Hail et al. 2014).[6] The resulting reduced incentive for managers to pay out free cash flow leads firms to decrease dividends following CDS initiation.

In summary, the new information-revelation effect of CDS initiation can increase dividends through the pecking-order channel or decrease dividends through the agency-cost channel. It is an empirical matter whether the net effect of these two channels results in an increase or decrease in dividends following CDS initiation. More generally, because CDS initiation has multiple and offsetting effects on dividends through the pecking-order and agency-cost channels, how CDS initiation affects dividend payout is ultimately an empirical question.

3. Research Design

3.1. Dividends and CDS Initiation

To test how CDS initiation affects dividends, we estimate the following linear regression model given by Equation (1):

$$DPS_{it} = \beta TradedPost_{it} + \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \quad (1)$$

DPS_{it} is annual dividends per share for firm i in year t.[7] *TradedPost* is an indicator variable that equals one for observations occurring in the year of or years following CDS initiation, and zero otherwise. D_i, and D_t are firm- and year-fixed effects. Equation (1) is essentially a difference-in-differences research design that follows Bertrand and Mullainathan (2003).[8] If CDS initiation is associated with an increase (decrease) in dividends, then $\beta > 0$ ($\beta < 0$).

Controls is a set of control variables for a variety of firm-specific characteristics suggested by prior research to affect dividend payments (Fama and French 2001, John et al. 2011). The firm characteristics include return on assets (*ROA*), firm size (*SIZE*), the equity market-to-book ratio (*MB*), asset growth (*ASSET_GROWTH*), sales growth (*SALES_GROWTH*), annual stock return volatility (*STD_RET*), firm age (*AGE*), leverage (*LEV*), and lagged dividend per share (*L_DPS*).[9] We also estimate Equation (1) by clustering standard errors at the firm level.[10] All variables are defined in the appendix.

A research design problem common to studies on CDS initiation is that CDS initiation is possibly endogenously related to a change in some other unobservable time-varying firm characteristics. To address this possibility, following prior literature, we estimate Equation (1) using a propensity score-matched sample (e.g., Saretto and Tookes 2013, Subrahmanyam et al. 2014, and Amiram et al. 2017). To construct the propensity score-matched sample, following Ashcraft and Santos (2009), Subrahmanyam et al. (2014), and Amiram et al. (2017), we match each firm that is CDS-traded with one that is not based on propensity scores and then use the firm-year observations of the CDS-traded firms and matched non-CDS-traded firms to estimate Equation (1). To do this, we first estimate a probit model with *TradedPost* as the dependent variable and a set of explanatory variables that are assumed to determine the likelihood of CDS trading, which includes return on assets, firm size, the equity market-to-book ratio, stock return volatility, leverage, credit ratings, and whether the firm has credit ratings. We then use the estimated model parameters to calculate propensity scores for each firm.[11] We match, without replacement, each CDS firm to the non-CDS-traded firm whose propensity score is closest.

4. Sample and Data

Our sample comprises all firm-year observations in Compustat between 1990 and 2014 and CRSP with data necessary to estimate Equation (1). In addition, following prior research, we exclude financial and utility firms—Standard Industrial Classification (SIC) codes 6000–6999 and 4900–4949 (John et al. 2011, Floyd et al. 2015). We also require a firm to have at least one loan included in the DealScan database between 1990 and 2014.

We use the following steps to identify CDS initiations for the firms in our sample. First, we identify all the firms in the sample that ever had a CDS market developed for their debt according to IHS Markit. Next, for every such firm, we identify the earliest date in which a five-year-to maturity, U.S.-dollar-denominated CDS contract is quoted for trading. We use this date as the date of the onset of CDS trading.[12] Based on this procedure, we identify 644 CDS-traded and 6,069 non-CDS-traded firms, which corresponds to 12,175 and 60,566 (for a total of 72,741) firm-years for CDS- and non-CDS-traded firms. If a firm is referenced by a CDS contract during our sample period, regardless of the year of CDS initiation, it is included in the CDS-traded group during the entire sample period. All other firms are included in the control group. Because the CDS initiation date is staggered over time for CDS-traded firms, for a given year in which there is a CDS initiation, the control group also includes CDS-traded firms that do not have CDS initiation in that year (Bertrand and Mullainathan 2003).

Tables 1 and 2 present the distribution of CDS- and non-CDS-traded firm-year observations by year and industry. Table 1 reveals that the percentage of CDS-traded firms ranges from a low of 12.56% in 1996 to a high of 20.62% in 2011. Table 2 reveals that the percentage of CDS-traded firms ranges from a low of 9.21% for firms in the Business Equipment industry to a high of 33.53% for firms in the Chemicals and Allied Products industry.

Tables 3 and 4 present summary statistics for treatment and control firm-years for the full sample. Table

Table 1. Sample Description: CDS-Traded and Non-CDS-Traded Firms Across Years

Fiscal year	CDS firms	Non-CDS firms	Percentage (%)
1990	286	1,471	16.28
1991	375	2,296	14.04
1992	387	2,444	13.67
1993	419	2,811	12.97
1994	443	3,029	12.76
1995	469	3,178	12.86
1996	482	3,355	12.56
1997	507	3,477	12.73
1998	513	3,268	13.57
1999	532	3,056	14.83
2000	547	2,838	16.16
2001	576	2,758	17.28
2002	585	2,598	18.38
2003	588	2,453	19.34
2004	573	2,308	19.89
2005	572	2,270	20.13
2006	555	2,193	20.20
2007	534	2,114	20.17
2008	509	2,025	20.09
2009	497	1,956	20.26
2010	481	1,864	20.51
2011	469	1,805	20.62
2012	452	1,759	20.44
2013	437	1,738	20.09
2014	387	1,502	20.49
Overall	*12,175*	*60,566*	*16.74*

Notes. This table and Table 2 present the distribution of the sample of 72,741 firm-year observations by year and industry. This table reports the distribution for CDS-traded firms and non-CDS-traded firms by year.

Table 2. Sample Description: CDS-Traded and Non-CDS-Traded Firms Across Industries

Industry	CDS firms	Non-CDS firms	Percentage (%)
Business Equipment	1,318	12,989	9.21
Chemicals and Allied Products	736	1,459	33.53
Consumer Durables	386	2,158	15.17
Consumer Non-Durables	1,098	4,173	20.83
Energy	1,269	3,344	27.51
Healthcare, Medical Equipment, and Drugs	1,071	6,052	15.04
Manufacturing	2,120	8,674	19.64
Other	1,996	10,773	15.63
Shops Wholesale and Retail	1,266	8,766	12.62
Telephone and Television Transmission	915	2,178	29.58
Overall	*12,175*	*60,566*	*16.74*

Notes. Table 1 and this table present the distribution of the sample of 72,741 firm-year observations by year and industry. This table reports the distribution for CDS-traded firms and non-CDS-traded firms by industry.

3 presents statistics combining all firm-years; Table 4 presents statistics before and after CDS initiation for CDS-traded firms using all firm-years. Table 3 reveals that CDS-traded firms are significantly different from non-CDS-traded firms along several dimensions.[13] In particular, on average, they have larger dividends per share (mean *DPS* difference = 0.304), are larger (mean *SIZE* difference = 2.882), are more profitable (mean *ROA* difference = 0.059), and are older (mean *AGE* difference = 10.94). However, CDS-traded firms exhibit slower growth (mean *SALES_GROWTH* difference = –0.031, mean *ASSET_GROWTH* difference = –0.078), a slightly higher equity market-to-book ratio (mean *MB* difference = 0.031), and lower annual stock return volatility (mean *STD_RET* difference = –0.015).[14]

Table 4 reveals that dividends increase both statistically and economically after CDS initiation for CDS-traded firms. In particular, mean *DPS* increases from 0.322 to 0.583. Untabulated statistics related to the propensity score-matched sample also reveals that dividends increase both statistically and economically after CDS initiation, not just for CDS-traded firms, but also for non-CDS-traded firms.[15] In particular, mean *DPS* increases from 0.326 to 0.583 and from 0.188 to 0.344 for CDS-traded and non-CDS-traded firms. These statistics are consistent with prior studies, indicating that dividends exhibit a trend in years that overlap with our sample period (Floyd et al. 2015). The use of the difference-in-differences research design with time fixed effects mitigates the effect of dividend trends on our inferences.

Table 4 also indicates that after CDS initiation, CDS-traded firms become larger (mean *SIZE* difference = 1.119) and have slower sales growth (mean *SALES_GROWTH* difference = – 0.075). More importantly, untabulated statistics reveal that CDS- and non-CDS-traded firms in the propensity score-matched sample are more comparable.[16] As in prior research, CDS-traded firms are significantly larger than matched non-CDS-traded firms (Ashcraft and Santos 2009, Amiram et al. 2017). The effects of this difference are mitigated by including firm size when estimating Equation (1).

5. Results

5.1. CDS Initiations and Dividend Changes

5.1.1. Main Results. Table 5, columns (1) and (2), reports the regression results associated with estimation of Equation (1) for the full and propensity score-matched samples. The key finding for the full sample is that the coefficient on *TradedPost* is 0.070 with a *t*-statistic of 6.60. This coefficient is not only statistically significant, but also economically significant. Specifically, the coefficient on *TradedPost* implies that, on average, the dividend increases of CDS-traded firms following CDS initiation are \$0.070 per share higher than those of controlling firms, which is almost 22% of the sample mean for CDS firms before CDS initiations. When we estimate Equation (1) for the matched sample in column (2), the coefficient on *TradedPost* is 0.036 with a *t*-statistic of 4.17. Because covariate balance is not fully achieved for the propensity score sample, we also estimated Equation (1) using overlap weights matching (Li et al. 2018), which uses an estimated propensity of CDS trading to reweight observations to ensure that the treatment and control groups' covariates—that is, firm characteristics—are exactly balanced at the mean. The findings presented in column (3) reveal that the *TradedPost* coefficient is marginally significantly positive (coefficient = 0.028; *t*-statistic = 1.72).[17]

5.1.2. Short Window Test. The findings in columns (1) and (2) are based on using all firm-years during our sample period. The relatively long window in year surrounding CDS initiation raises the possibility that other events unrelated to CDS initiation that occur before and after CDS initiation could be the underlying reason for the increases in the dividends following CDS initiation. To address this possibility, we estimate

Table 3. Descriptive Statistics: CDS-Traded Firms vs. Non-CDS-Traded Firms

	All observations (N = 72,741)		CDS-traded firms (N = 12,175)		Non-CDS-traded firms (N = 60,566)		
Variable	Mean	Std	Mean (A)	Std	Mean (B)	Std	Diff. A – B
Firm characteristics							
DPS	0.195	0.470	0.448	0.632	0.144	0.412	0.304***
SIZE	5.664	2.196	8.064	1.626	5.182	1.968	2.882***
MB	1.915	1.818	1.940	1.729	1.909	1.835	0.031*
ROA	0.004	0.276	0.053	0.115	−0.006	0.297	0.059***
ASSET_GROWTH	0.224	3.510	0.159	0.673	0.237	3.834	−0.078**
SALES_GROWTH	0.133	0.268	0.107	0.186	0.138	0.281	−0.031***
STD_RET	0.038	0.023	0.025	0.014	0.040	0.024	−0.015***
AGE	14.883	12.960	23.990	16.300	13.050	11.330	10.940***
LEV	0.249	0.217	0.306	0.194	0.238	0.220	0.068***
L_DPS	0.185	0.460	0.423	0.615	0.137	0.405	0.286***

Notes. This table and Table 4 present summary statistics for the sample of 72,741 firm-year observations from 1990 through 2014. This table reports mean and standard deviations (Std) statistics of CDS-traded firms and non-CDS-traded firms. Definitions of all variables are provided in the appendix. Diff., difference.
$^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Equation (1) using observations three years before and after the CDS initiation year. This approach increases our confidence that changes in dividends following CDS initiation are attributable to CDS initiation rather than to other events that are unrelated to CDS initiation.

To implement this approach, for each CDS-traded firm, we identify a non-CDS-traded firm with propensity score closest to each CDS-traded firm and assign the CDS initiation date to its matched firm. We use observations three years before and after the assigned CDS initiation year for both the CDS-traded and its matched non-CDS-traded firm. Table 5, column (4), which presents the findings from the estimation, reveals that the *TradedPost* coefficient, 0.035, is significantly positive (t-statistic = 2.27). This finding increases our confidence that the increase in dividends following CDS initiation is not attributable to other events.

5.1.3. Parallel Trends Assumption. Because the difference-in-differences estimation of Equation (1) rests on the assumption of parallel trends in the dependent variable before and after CDS initiation, we conduct an analysis to assess the validity of this assumption. We do this by estimating a version of Equation (1) that replaces *TradedPost* with separate indicator variables, CDS_year_k—that is, for the years beginning three years before CDS initiation, CDS_year_{-3}, and ending three years after CDS initiation, CDS_year_{+3}. Following prior research (e.g., Christensen et al. 2016 and Kim and Valentine 2021), we omit the indicator for

Table 4. Descriptive Statistics: Firm Characteristics Before and After CDS Initiation for CDS-Traded Firms

	Before CDS initiation (N = 6,279)		After CDS initiation (N = 5,896)		
Variable	Mean (A)	Std Dev	Mean (B)	Std Dev	Diff. B – A
Firm characteristics					
DPS	0.322	0.531	0.583	0.699	0.261***
SIZE	7.522	1.567	8.641	1.482	1.119***
MB	2.113	2.233	1.757	0.892	−0.356***
ROA	0.055	0.128	0.051	0.099	−0.004**
ASSET_GROWTH	0.224	0.858	0.089	0.378	−0.135***
SALES_GROWTH	0.144	0.212	0.069	0.145	−0.075***
STD_RET	0.026	0.013	0.024	0.015	−0.002***
AGE	19.920	14.700	28.330	16.810	8.410***
LEV	0.304	0.198	0.308	0.189	0.004
L_DPS	0.314	0.534	0.540	0.673	0.226***

Notes. Table 3 and this table present summary statistics for the sample of 72,741 firm-year observations from 1990 through 2014. This table reports mean and standard deviations (Std Dev) statistics of CDS-traded firms before and after CDS initiation. Definitions of all variables are provided in the appendix. Diff., difference.
$^{**}p < 0.05$; $^{***}p < 0.01$.

Table 5. CDS Initiation and Dividends

Variables	(1) Baseline	(2) PSM	(3) Overlap weights	(4) [−3,+3] window
TradedPost	0.070***	0.036***	0.028*	0.035**
	(6.60)	(4.17)	(1.72)	(2.27)
SIZE	0.025***	0.023***	0.070***	0.023**
	(13.04)	(5.44)	(6.01)	(2.32)
MB	−0.001**	0.001	−0.001	−0.003
	(−2.28)	(0.55)	(−0.16)	(−1.31)
ROA	0.005	0.020	0.060	0.033
	(1.38)	(1.06)	(0.94)	(0.98)
ASSET_GROWTH	−0.000	−0.005	−0.055**	0.005
	(−0.84)	(−1.53)	(−2.29)	(0.64)
SALES_GROWTH	−0.000	0.052***	0.043	−0.028
	(−0.06)	(3.36)	(1.09)	(−0.58)
STD_RET	−0.312***	−2.252***	−2.382***	−1.773***
	(−3.89)	(−9.13)	(−4.33)	(−2.69)
AGE	0.017	0.004***	0.009	−0.001
	(1.09)	(4.78)	(0.10)	(−0.01)
LEV	−0.011	−0.008	0.053	−0.026
	(−1.05)	(−0.33)	(1.02)	(−0.53)
L_DPS	0.563***	0.668***	0.582***	0.416***
	(32.58)	(29.85)	(18.75)	(6.53)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	72,741	22,066	72,741	5,762
R^2	0.776	0.798	0.802	0.786

Notes. This table reports the results of ordinary least squares (OLS) regressions investigating the effects of CDS initiation on dividends. Definitions of all variables are provided in the appendix. The dependent variable is dividend per share, *DPS*. Column (1) presents the baseline regression results of estimating Equation (1). Column (2) reports the results of estimating Equation (1) using a propensity score-matched sample. Column (3) reports the results of estimating Equation (1) using the overlap weights matching approach (Li et al. 2018). Column (4) reports the regression results of estimating Equation (1) using a propensity score-matched sample over a time window [−3, +3] years surrounding the CDS initiation year. *t*-statistics in parentheses are based on standard errors clustered by firm. All estimations include year and firm fixed effects (FE).
$^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

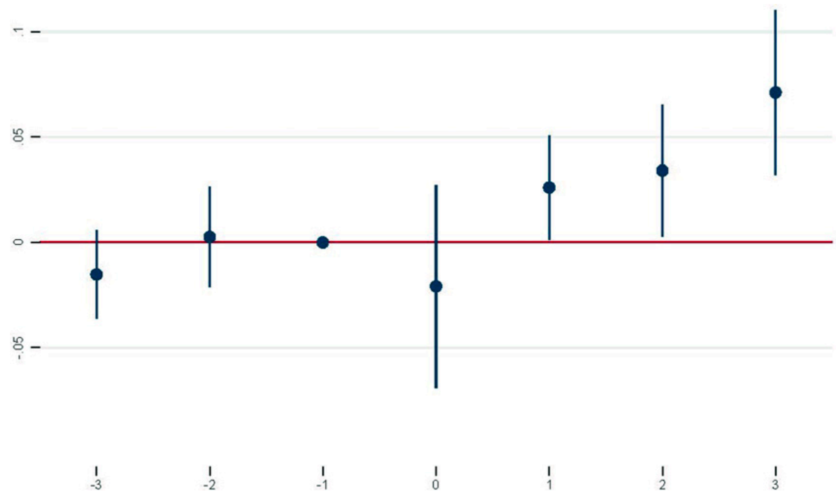
the year immediately before CDS initiation, which implies that the year before CDS initiation is the benchmark year. If the parallel trends assumption is valid, the coefficients for CDS_year_{-3} and CDS_year_{-2}, and will be insignificantly different from zero. This regression also permits us to assess the timing of when dividends increase following CDS initiation.

We present the key findings from this regression by graphing the CDS_year_k coefficients, including the 90% confidence interval surrounding each coefficient. Figure 1 presents the findings based on estimating Equation (1) using the short-window sample, which has the virtue of mitigating the potential effects of confounding events unrelated to CDS initiation. The figure reveals that the CDS_year_{-3} and CDS_year_{-2} coefficients, –0.018 and –0.003, are insignificant, which implies that dividend levels in the two years preceding the benchmark year (CDS_year_{-1}) are indistinguishable from the benchmark level. The figure also reveals that each of the three post-CDS initiation year coefficients, 0.026, 0.034, and 0.071, is significantly positive, which implies that dividends increase beginning in the first year after CDS initiation.

5.1.4. Using an Instrumental Variable Approach to Address Endogeneity. In addition to use of various matched-sample estimations, we also apply an instrumental variable approach to mitigate further the concern that CDS initiation arises endogenously. Following Saretto and Tookes (2013), Subrahmanyam et al. (2014), and Amiram et al. (2017), we use the foreign exchange (FX) hedging position of lenders, *Lender_FX*, as an instrument for *TradedPost*.[18] Because *TradedPost* is an endogenous binary variable, following Bharath et al. (2011) and Saretto and Tookes (2013), we implement our instrumental variable approach using a first-stage probit model to estimate the predicted value for *TradedPost*, which is then used as an instrument in the standard two-stage least-squares estimation (Wooldridge 2010).[19] When estimating the probit model, we also include all control variables.

Table 6, columns (1) and (2), reports the regression summary statistics associated with estimation of the probit model and Equation (1) using the fitted value of *TradedPost*. The key finding in column (1) is that *Lender_FX* is a strong instrument for *TradedPost*—that is, its coefficient is positive and significant and the

Figure 1. (Color online) Dividend per Share Surrounding CDS Initiation Dates



Notes. This figure presents the results of investigating the differences in dividend per share between the CDS-traded firms and non-CDS-traded firms over a time window [−3, +3] years surrounding the CDS initiation years. We do this by estimating a version of Equation (1) that replaces *TradedPost* with separate indicator variables, CDS_year_k—that is, for the years beginning three years before CDS initiation, CDS_year_{-3}, and ending three years after CDS initiation, CDS_year_{+3}. We omit the indicator for the year immediately before CDS initiation, which implies that the year before CDS initiation is the benchmark year. This figure presents the key findings from this regression by graphing the CDS_year_k coefficients, including the 90% confidence interval surrounding each coefficient.

incremental Wald χ^2-statistic is 23.93, which is significant at less than the 0.001 level. The key finding in column (2) is that the coefficient for the fitted *TradedPost* coefficient is significantly positive (coefficient = 0.174; t-statistic = 10.36). This finding suggests that a one-standard-deviation increase in the fitted value of *TradedPost* from the probit model implies increases in dividends per share of 0.073, which is consistent with the findings in Table 5.

5.1.5. Liquidity Test. A key assumption underlying our predictions linking CDS initiation to changes in dividend policy is that CDS markets are sufficiently liquid to permit lenders to purchase CDS to transfer credit risk. To the extent that there is heterogeneity in our sample regarding CDS market liquidity, we predict that the effects of CDS initiation on dividend policy are greater when CDS market liquidity is higher. To test this prediction, we estimate Equation (2):

$$DPS_{it} = \alpha + \beta_1 TradedPost\_LIQH_{it} + \beta_2 TradedPost\_LIQL_{it} \\ \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \quad (2)$$

Equation (2) modifies Equation (1) by partitioning CDS-traded firms into two groups, those with relatively high and low CDS market liquidity. *TradedPost_Hi_LIQ* (*TradedPost_Low_LIQ*) equals one if an observation occurs in the year of CDS initiation or thereafter and the firm's CDS trades in a relatively high (low) liquid market, and equals zero otherwise. Following Ashcraft and Santos (2009), Qiu and Yu (2012), and Amiram et al. (2017), we use the number of distinct dealers providing quotes as our proxy for CDS market liquidity. We classify a CDS-traded firm as having high (low) CDS market liquidity if the mean number of daily distinct dealers during the post-CDS initiation period is above (below) the CDS-trading sample median. We also estimate a version of Equation (1) separately for subsamples of observations with relatively high and low CDS market liquidity and use the full control sample of non-CDS-traded firms. Table 7 reports the regression summary statistics relating to Equation (2) and the two subsample estimations.[20]

The findings in Table 7 for the subsample estimations in columns (1) and (2) reveal that the *TradedPost* coefficient is significantly positive for both subsamples, but larger for the high CDS market liquidity subsample (high-liquidity and low-liquidity subsample coefficients = 0.121 and 0.041; t-statistics = 7.15 and 2.80). The findings in column (3) also reveal that the *TradedPost_Hi_LIQ* and *TradedPost_Low_LIQ* coefficients are significantly positive (coefficients = 0.114 and 0.033; t-statistics = 7.17 and 2.37). However, the difference is significantly positive (F-statistic = 15.44, p-value $<$ 0.001).[21] Taken together, the findings in Table 7 indicate that CDS initiation is associated with a larger dividend increase when the firm's CDS is traded in a relatively highly liquid market, which is additional evidence that the existence of an active CDS market plays a role in increasing dividends.

5.1.6. Capital Structure. Prior literature finds that CDS initiation can affect capital structure. Although

Table 6. CDS Initiation and Dividends: Instrumental Variable Approach

Variables	(1) Probit model	(2) *DPS*
TradedPost Fitted		0.174***
		(10.36)
Lender_FX	5.041***	
	(4.89)	
SIZE	0.729***	0.024***
	(23.29)	(12.56)
MB	−0.349***	−0.001*
	(−7.92)	(−1.83)
ROA	−0.444***	0.005
	(−3.23)	(1.46)
ASSET_GROWTH	−0.200***	−0.000
	(−3.30)	(−0.88)
SALES_GROWTH	−0.941***	−0.004
	(−6.34)	(−0.73)
STD_RET	7.528***	−0.416***
	(3.63)	(−5.11)
AGE	1.903***	−0.014
	(12.55)	(−1.35)
LEV	0.029***	0.013
	(12.63)	(0.83)
L_DPS	0.021	0.558***
	(0.46)	(32.24)
Firm FE		YES
Year FE	YES	YES
Industry FE	YES	
Instrument Wald χ^2	23.93	
Observations	72,741	72,741
Pseudo R^2	0.621	0.777

Notes. This table reports the results of ordinary least-squares (OLS) regression investigating the effects of CDS initiation on dividends using an instrumental variable approach. The instrument for *TradedPost* is the average amount of foreign exchange derivatives used for hedging purposes (not trading) relative to total assets of the lead banks that the borrower has done business with in the past five years (*Lender_FX*). We implement our instrumental variable approach using a probit model to estimate the predicted value for *TradedPost*, which is then used as an instrument in the standard two-stage least-squares estimation (Wooldridge 2010)—see endnote 19 for details. Column (1) reports the results of estimating the Probit model. Column (2) reports the results of estimating the OLS regression using the fitted valued of *TradedPost*. Definitions of all variables are provided in the appendix. *t*-statistics in parentheses are based on standard errors clustered by firm. FE, fixed effects.

$^*p < 0.10$; $^{***}p < 0.01$.

Table 7. The Effect of CDS Initiation on Dividends: Does CDS Market Liquidity Matter?

Variables	(1) *Hi_LIQ* *DPS*	(2) *Low_LIQ* *DPS*	(3) Full sample *DPS*
TradedPost	0.121***	0.041***	
	(7.15)	(2.80)	
TradedPost_Hi_LIQ(β_1)			0.114***
			(7.17)
TradedPost_Low_LIQ(β_2)			0.033**
			(2.37)
SIZE	0.024***	0.025***	0.025***
	(13.10)	(12.69)	(13.20)
MB	−0.001**	−0.001**	−0.001**
	(−2.20)	(−2.28)	(−2.30)
ROA	0.005	0.004	0.005
	(1.45)	(1.17)	(1.40)
ASSET_GROWTH	−0.000	−0.000	−0.000
	(−0.80)	(−0.87)	(−0.84)
SALES_GROWTH	−0.003	−0.003	−0.001
	(−0.57)	(−0.64)	(−0.26)
STD_RET	−0.275***	−0.277***	−0.312***
	(−3.59)	(−3.42)	(−3.90)
AGE	0.029***	0.010	0.017
	(2.84)	(0.60)	(1.10)
LEV	−0.010	−0.005	−0.010
	(−1.00)	(−0.51)	(−1.03)
L_DPS	0.533***	0.529***	0.562***
	(28.24)	(27.90)	(32.56)
Test: $\beta_1 = \beta_2$			F = 15.44***
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	66,013	67,294	72,741
R^2	0.769	0.752	0.776

Notes. This table reports the results of ordinary least-squares (OLS) regressions investigating whether firms' CDS market liquidity moderates the effect of CDS initiation on dividends. The dependent variable is dividend per share, *DPS*. In columns (1) and (2), we separately examine the effect of CDS initiation on dividends for subsamples of high and low CDS market liquidity, *Hi_LIQ* and *Low_LIQ*, using the full sample of non-CDS-traded firms as control. We classify a CDS-traded firm as having high (low) CDS market liquidity if the mean number of daily dealers during the post-CDS initiation period is above (below) the CDS-trading sample median. Column (3) presents the regression results associated with estimation of Equation (2). Definitions of all variables are provided in the appendix. *t*-statistics in parentheses are based on standard errors clustered by firm. FE, fixed effects.

$^{**}p < 0.05$; $^{***}p < 0.01$.

our main tests include leverage as a control variable, we conduct two additional tests to mitigate the concern that our finding of an increase in dividends following CDS initiation is attributable to CDS initiation being correlated with the extent of a change in firm's debt structure.

First, following Amiram et al. (2017), we also estimate Equation (1) by disaggregating leverage, *LEV*, into bank debt leverage and nonbank debt leverage, *LEV_BANK* and *LEV_NBANK*, which effectively relaxes the constraint that these two sources of leverage have the same effects on dividend policy. The findings in Table 8, column (1), reveal that although the coefficient on *LEV_BANK* is significantly positive and that on *LEV_NBANK* is insignificant, the *TradedPost* coefficient for the full sample, 0.07 (*t*-statistic = 6.60), is essentially the same as that for the full sample reported in Table 5.

Second, following Subrahmanyam et al. (2017), we also estimate Equation (1) in a simultaneous equations framework in which capital structure—that is, leverage—and dividend payout are jointly determined (Bolton et al. 2011, 2013). We use a two-stage least-squares procedure in which the first-stage equation includes industry mean leverage as the instrument for firm-

Table 8. The Effect of CDS Initiation on Dividends: Control for Capital Structure

		(2)	(3)
		Simultaneous equations	
	(1)		
Variables	*DPS*	*DPS*	*LEV*
TradedPost	0.070***	0.059***	0.016**
	(6.60)	(5.38)	(2.53)
DPS			0.020
			(0.58)
LEV		0.354***	
		(2.63)	
DPS_IND		0.401***	
		(11.44)	
LEV_IND			0.201***
			(11.12)
SIZE	0.025***	0.035***	−0.028***
	(13.03)	(8.13)	(−14.59)
MB	−0.001**	−0.001	−0.002***
	(−2.39)	(−0.94)	(−2.68)
ROA	0.005	0.023***	−0.052***
	(1.33)	(2.78)	(−6.38)
ASSET_GROWTH	−0.000	0.000	−0.001**
	(−0.83)	(0.47)	(−2.20)
SALES_GROWTH	−0.000	−0.010*	0.023***
	(−0.01)	(−1.77)	(4.64)
STD_RET	−0.308***	−0.590***	0.681***
	(−3.85)	(−5.08)	(9.45)
AGE	0.016	0.026	−0.030**
	(1.08)	(1.53)	(−2.18)
L_DPS	0.563***	0.551***	−0.004
	(32.60)	(33.17)	(−0.18)
LEV_BANK	−0.029**		
	(−2.43)		
LEV_NBANK	−0.002		
	(−0.15)		
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	72,741	72,688	72,688
R^2	0.776	0.778	0.683

Notes. This table presents the results of investigating the effect of CDS initiation on dividends after controlling for the potential effect of CDS initiation on capital structure. Column (1) presents the results of estimating Equation (1) by disaggregating leverage, *LEV*, into bank debt leverage and nonbank debt leverage (*LEV_BANK* and *LEV_NBANK*). Columns (2) and (3) present the regression results of estimating the simultaneous effect of CDS initiation on leverage and dividends. Definitions of all variables are provided in the appendix. *t*-statistics in parentheses are based on standard errors clustered by firm. FE, fixed effects.

$^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

level leverage and industry mean dividend payout as an instrument for firm-level dividend payout, and the second-stage equations use the fitted values obtained from the first-stage estimations. Table 8, column (2), which presents the findings relating to the second-stage dividend model, reveals the same inference that dividends increase after CDS initiation. Specifically, the coefficient on the fitted *TradedPost* is positive and significant (coefficient = 0.059; *t*-statistic = 5.38).[22]

5.2. Role of Reduced Monitoring Through the Agency-Cost Channel

The findings in Table 5 showing dividends increase following CDS initiation are consistent with reduced monitoring increasing agency costs and new information revelation reducing the relative cost of external financing.[23] In this section, we conduct three analyses to provide evidence of reduced monitoring increasing dividends through the agency-cost channel.

5.2.1. Dividends and Free Cash Flow. Based on the discussion of the free cash flow theory in Section 2, firms that have high free cash flow have high agency costs. Thus, for those firms with relatively high free cash flow before CDS initiation, reduced monitoring by bank lenders following CDS initiation will exacerbate agency conflicts and increase dividends more than for firms with relatively low free cash flow. In other words, for a given level of monitoring reduction, we predict that firms with relatively higher free cash flow before CDS initiation will increase dividends more. To test this prediction, we estimate Equation (3):

$$\begin{aligned} DPS_{it} = \alpha &+ \beta_1 TradedPost\_Hi\_FCF_{it} \\ &+ \beta_2 TradedPost\_Low\_FCF_{it} \\ &+ \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \end{aligned} \quad (3)$$

Equation (3) modifies Equation (1) by partitioning CDS-traded firms into two groups, those with relatively high and low free cash flow before CDS initiation. *TradedPost_Hi_FCF* (*TradedPost_Low_FCF*) equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has a relatively high (low) free cash flow problem in the three years before CDS initiation, and equals zero otherwise. We classify a CDS-traded firm as having a high (low) free cash flow if its free cash flow is above (below) the median for CDS-traded firms. Based on the above prediction, we predict $\beta_1 > \beta_2$.

Following Demirgüç-Kunt and Maksimovic (1998) and Leuz et al. (2008), we measure free cash flow, *FCF*, as $ROA/(1 - ROA)$ minus industry median total asset growth. *FCF* reflects the excess cash flow that managers may be able to redirect to create private benefits.[24] *FCF* exhibits high values for firms that internally generate a large amount of cash flow, but have few investment opportunities and, hence, are more prone to free cash problems. An advantage of this measure is that it considers both firms' ability to generate cash and their growth prospects.[25]

Table 9, column (1), presents the results associated with estimation of Equation (3). The findings reveal that whereas the *TradedPost_Hi_FCF* coefficient, 0.122, is significantly positive, the *TradedPost_Low_FCF* coefficient,

Table 9. Cross-Sectional Tests

Variables	(1) *DPS*	(2) *DPS*	(3) *DPS*	(4) *DPS*	(5) *DPS*
TradedPost_Hi_FCF (α_1)	0.122***				
	(8.34)				
TradedPost_Low_FCF (α_2)	0.015				
	(1.05)				
TradedPost_Hi_REP (β_1)		0.054***			
		(4.38)			
TradedPost_Low_REP (β_2)		0.112***			
		(5.83)			
TradedPost_Hi_PVIOL (γ_1)			0.014		
			(0.88)		
TradedPost_Low_PVIOL (γ_2)			0.111***		
			(8.00)		
TradedPost_Hi_NFinCov (ζ_1)				0.013	
				(0.86)	
TradedPost_Low_ NFinCov (ζ_2)				0.119***	
				(8.47)	
TradedPost_Hi_FC (θ_1)					0.074***
					(4.99)
TradedPost_Low_FC (θ_2)					0.031*
					(1.70)
$\alpha_1 = \alpha_2$	F = 27.37***				
$\beta_1 = \beta_2$		F = 6.64***			
$\gamma_1 = \gamma_2$			F = 22.63***		
$\zeta_1 = \zeta_2$				F = 27.50***	
$\theta_1 = \theta_2$					F = 3.47*
Controls	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	72,741	72,741	72,741	72,741	69,539
R^2	0.777	0.776	0.776	0.777	0.765

Notes. This table reports the results of ordinary least-squares (OLS) regressions investigating whether the effect of CDS initiation on dividends varies with firm's free cash flow level, lead arranger bank's reputation, accounting covenant restrictiveness, and degree of financial constraint. The dependent variable is dividend per share, *DPS*. We partition CDS-traded firms into two groups in each column, those with relatively high and low free cash flow before CDS initiation in column (1), those with relatively high and low lead arranger bank reputation in column (2), those with relatively high and low accounting covenant restrictiveness measures in columns (3) and (4), and those with relatively high and low degree of financial constraint before CDS initiation in column (5). Definitions of all variables are provided in the appendix. t-statistics in parentheses are based on standard errors clustered by firm. FE, fixed effects.
*$p < 0.10$; ***$p < 0.01$.

0.015, is insignificant (t-statistics = 8.34 and 1.05). In addition, the difference is significantly positive (F-statistic = 27.37). Thus, consistent with our prediction, firms with relatively higher free cash flow before CDS initiation increase dividends more and are evidence of increased agency costs resulting from reduced monitoring.

5.2.2. Dividends and Lead Arranger Reputation. The key assumption underlying the reduced monitoring effect is that banks can transfer credit risk to third parties using CDSs. However, prior research suggests that reputable banks may be less likely to reduce monitoring efforts (Sufi 2007, Amiram et al. 2017). In particular, because the syndicated loan market is one of repeated interactions, lead arranger banks that engage frequently in the loan market can suffer a loss of reputation if their loans subsequently default as a result of low monitoring effort (Gopalan et al. 2011). Thus, we predict that the reduced monitoring effect through the agency cost channel is smaller, and, therefore, dividend increases are smaller if the lead arranger bank has a stronger reputation in the syndicated loan market. To test this prediction, we estimate Equation (4):

$$\begin{aligned} DPS_{it} = {} & \alpha + \beta_1 TradedPost\_Hi\_REP_{it} \\ & + \beta_2 TradedPost\_Low\_REP_{it} \\ & + \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \end{aligned} \tag{4}$$

Equation (4) modifies Equation (1) by partitioning CDS-traded firms into two groups, one with reputable lead banks and one with less reputable banks. *Traded Post_Hi_REP* equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has a lending relationship with a reputable lead bank in the year of CDS initiation, and equals zero otherwise.[26]

Similarly, *TradedPost_Low_REP* equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has no lending relationship with a reputable lead bank in the year of CDS initiation, and equals zero otherwise. We classify a bank as having a high (low) reputation if it is among (is not among) the top five lead arranger banks in terms of market share in the U.S syndicated loan market.[27] Based on the above prediction, we predict $\beta_2 > \beta_1$.

Table 9, column (2), presents the results associated with estimation of Equation (4). The findings reveal that the coefficients on *TradedPost_Low_REP* and *TradedPost_Hi_REP* are 0.112 and 0.054, and the difference is significantly positive (F-statistic = 6.64). Thus, firms with less reputable lead arrangers tend to increase dividends more than those with more reputable lead arrangers after CDS initiations. These findings are consistent with the conjecture that the reputation of lead arranger banks mitigates the effects of reduced monitoring intensity on firm dividend increases and, therefore, are additional evidence of increased agency costs resulting from reduced monitoring.

5.2.3. Dividends and Accounting Covenants.

An important mechanism through which banks monitor borrowers' activities subsequent to loan origination is the use of financial covenants (e.g., Dichev and Skinner 2002 and Christensen et al. 2016).[28] To the extent that financial covenants are more restrictive in that they are tighter or there are more of them attached to a particular loan, then monitoring intensity is likely to be stronger.

Thus, following CDS initiation, even though banks—particularly the lead bank—may transfer credit risk, banks are more likely to continue to monitor borrowers if existing loans have covenants that are more restrictive. This is because loan covenants associated with pre-existing loans serve as a monitoring mechanism that permits all participant banks in a loan syndicate to monitor the borrower's activities, even if the lead arranger bank transfers credit risk with a CDS.[29] As a result, equityholders can continue to rely on monitoring by lenders and not demand an increase in dividends when covenants are more restrictive. Thus, we predict that for firms with pre-existing loans with more restrictive financial covenants, their dividend increases are smaller following CDS initiation. We test this prediction by estimating Equation (5):

$$\begin{aligned} DPS_{it} = \alpha &+ \beta_1 TradedPost\_Hi\_CovRestrict_{it} \\ &+ \beta_2 TradedPost\_Low\_CovRestrict_{it} \\ &+ \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \end{aligned} \tag{5}$$

Equation (5) modifies Equation (1) by partitioning CDS-traded firms into two groups with relatively high and low covenant restrictiveness. Using covenant information from Dealscan, we measure covenant restrictiveness, *CovRestrict*, in two ways. The first, the probability of covenant violation, *PVIOL*, is based on the measure developed in Demerjian and Owens (2016) and is a proxy for tightness of loan covenants. The second proxy, *NFinCov*, is the number of financial covenants used in Kim et al. (2018). Both *PVIOL* and *NFinCov* for firm *i* are based on the average value for loans originated before CDS initiation that are still outstanding for at least a year following CDS initiation. *TradedPost_Hi_CovRestrict* (*TradedPost_Low_CovRestrict*) equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has a relatively high (low) level of covenant restrictiveness, and zero otherwise. Covenant restrictiveness is considered high (low) if each proxy is above (below) the sample median of CDS-traded firms. Based on the above prediction, we predict $\beta_2 > \beta_1$.

Table 9, columns (3) and (4), reports the regression summary statistics relating to Equation (5) based on *PVIOL* and *NFinCov*. The findings reveal that only the *Tradedpost_Low_CovRestrict* coefficient is significantly positive (coefficients = 0.111 and 0.119; t-statistics = 8.00 and 8.47), and the difference between the *TradedPost_Low_CovRestrict* and *TradedPost_Hi_CovRestrict* coefficients is significantly positive (F-statistics = 22.63 and 27.50). These findings indicate that dividend increases are smaller when firms have relatively high levels of pre-existing financial covenant restrictiveness and, hence, higher monitoring intensity and, therefore, are additional evidence of increased agency costs resulting from reduced monitoring.[30]

5.3. Role of New Information Revealed by CDS Through the Pecking-Order Channel

The findings in Table 5 showing dividends increase following CDS initiation also are consistent with new information revelation working through the pecking-order channel by decreasing the relative cost of external financing. The logic underlying this explanation is that CDS initiation reduces information asymmetry between managers and external capital providers by revealing new information. As a result, firms face relatively lower external financing costs, which reduces mangers' incentives to retain free cash flow, thereby increasing dividends. In other words, CDS initiation reduces the wedge between the cost of external capital and internal capital. Prior research suggests that financial constraints primarily arise from information asymmetries that make external capital more costly than internal capital (e.g., Tirole 2006 and Hoberg and Maksimovic 2015). The larger the wedge, the more capital-constrained a firm is. Thus, if CDS trading reduces information asymmetry, then firms with relatively high financial constraints before CDS initiation will increase dividends more than firms with low financial constraints. To test this prediction, we estimate Equation (6):

$$DPS_{it} = \alpha + \beta_1 TradedPost\_Hi\_FC_{it} + \beta_2 TradedPost\_Low\_FC_{it} + \gamma Controls + \alpha_i D_i + \alpha_t D_t + \varepsilon_{it}. \quad (6)$$

Equation (6) modifies Equation (1) by partitioning CDS-traded firms into two groups, those with relatively high and low financing constraints before CDS initiation. *TradedPost_Hi_FC* (*TradedPost_Low_FC*) equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has relatively high (low) financing constraints in the three years before CDS initiation, and equals zero otherwise. We classify a CDS-traded firm as having high (low) financing constraints if its financing constraint is above (below) the median for CDS-traded firms. Based on the above prediction, we predict $\beta_1 > \beta_2$.

We measure financing constraints based on the approach of Hoberg and Maksimovic (2015), which measures the degree of financial constraints based on textual analysis of the Management's Discussion and Analysis section in Form 10-Ks. Hoberg and Maksimovic (2015) find that investment delay, equity-focused, and equity-private-placement-focused constraint measures reflect financing constraints arising from information asymmetry among equityholders. Therefore, we measure our financial constraint variable as the first principal component of these three text-based measures.[31]

Column (5) of Table 9 presents the regression results associated with estimation of Equation (6). The findings reveal that whereas the *TradedPost_Hi_FC* coefficient, 0.074, is significantly positive, the *TradedPost_Low_FC* coefficient, 0.031, is only marginally significant (t-statistics = 4.99 and 1.70). In addition, the difference is significantly positive (F-statistic = 3.47). Thus, firms with relatively higher financing constraints before CDS initiation increase dividends more than firms with relatively lower financing constraints, which is evidence of new information revealed by CDS working through the pecking-order channel.[32]

6. Conclusion

This study examines whether the introduction of CDS trading affects dividend payout using the DeAngelo et al. (2008) information-asymmetry framework. We find that firms increase dividends following CDS initiation, which is consistent with firms distributing excess free cash flow to mitigate exacerbated manager-equityholder agency conflicts resulting from reduced monitoring by lenders following CDS initiation. Additional analyses support this explanation by showing that the increase in dividends is greater among firms with relatively higher free cash flow before CDS initiation, among firms whose lead arranger banks have a relatively less strong reputation in the loan-syndication market, and among firms whose pre-existing loans have less restrictive financial covenants following CDS initiation. An increase in dividends is also consistent with firms having a greater incentive to pay out free cash flow because external financing costs are relatively lower as a result of new information provided by CDS trading to the capital market. Supporting this explanation, we also find that firms with a relatively large wedge between internal and external financing costs before CDS initiation increase dividends more than firms with a relatively low wedge.

Findings from additional analyses support our study's inference that CDS initiation results in firms increasing dividends. First, we find that the increase in dividends is concentrated among firms with more liquid CDS markets. Second, we find that inferences are robust to controlling for the endogenous nature of CDS initiation and the potential effects of CDS initiation on capital structure.

Taken together, our study's findings provide evidence that CDS-trading initiation has external effects on a firm's equity capital providers. In particular, our findings suggest that CDS initiation benefits equityholders by providing information, but also is costly to equityholders because reduced monitoring by banks increases agency conflicts between managers and equityholders. Other debt-market innovations are likely to create externalities on the equity market that affect dividend payout, as well as other corporate financial policies. Our study can inform future research that examines the effects of other innovations in the debt market on providers of equity capital.

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Appendix: Variable Definitions

Variable	Measurement
DPS	Annual dividends per share, adjusted by the cumulative adjustment factor in Compustat.
TradedPost	An indicator variable that equals one for observations occurring in the year of or following CDS initiation, and zero otherwise.
SIZE	The logarithm of market value equity.
MB	Market value of equity divided by the book value of equity.
ASSET_GROWTH	Year-to-year changes in total assets deflated by the previous year total assets.
SALES_GROWTH	The sale revenue growth rate over the most recent three-year window; at least two sales-revenue figures are required.
ROA	Earnings before extraordinary items deflated by the book value of total assets.
STD_RET	The standard deviation of daily stock returns over a fiscal year period.
AGE	The number of years since the earliest trading date in CRSP.
LEV	Short-term debt plus long-term debt divided by total assets.
Lender_FX	Average amount of foreign exchange derivatives used for hedging purposes (not trading) relative to total assets of the lead banks that the borrower has done business with in the past five years.
LEV_BANK	Bank debt divided by total assets.
LEV_NBANK	Total debt minus bank debt, divided by total assets.
DPS_IND	The industry mean *DPS* across two-digit SIC codes.
LEV_IND	The industry mean *LEV* across two-digit SIC codes.
TradedPost_Hi_LIQ	We partition CDS-traded firms into two groups: high and low CDS market liquidity. *TradedPost_Hi_LIQ* is an indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm's CDS trades in a relatively high liquid market, and equals zero otherwise.
TradedPost_Low_LIQ	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm's CDS trades in a relatively low liquid market, and equals zero otherwise.
FCF	Free cash flow measured by *ROA*/(1−*ROA*) minus industry median total asset growth.
TradedPost_Hi_FCF	We partition CDS-traded firms into two groups: high and low free cash flow problem before CDS initiation. *TradedPost_Hi_FCF* is an indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has relatively high free cash problem before CDS initiation, and equals zero otherwise. Free cash flow problem is measured by *ROA*/(1−*ROA*) minus industry median total asset growth.
TradedPost_Low_FCF	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has relatively low free cash problem before CDS initiation, and equals zero otherwise.
FC	The degree of financial constraints. It is measured as the principle component of financial constraint proxies constructed by Hoberg and Maksimovic (2015) using Form 10-Ks.
TradedPost_Hi_FC	We partition CDS-traded firms into two groups: high and low financial constraints before CDS initiation. *TradedPost_Hi_FC* is an indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has relatively high financial constraint before CDS initiation, and equals zero otherwise.
TradedPost_Low_FC	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has relatively low financial constraint before CDS initiation, and equals zero otherwise.
TradedPost_Hi_REP	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has a lending relationship with a reputable lead bank in the year of CDS initiation, and equals zero otherwise
TradedPost_Low_REP	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm has no lending relationship with a reputable lead bank in the year of CDS initiation, and equals zero otherwise.
Cov_Restrict	We use two measures for *Cov_Restrict*. *PVIOL* is the covenant strictness measure created by Demerjian and Owens (2016). We take the average *PVIOL* across all outstanding loans in the CDS initiation year. *NFinCov* is the firm's average number of financial covenants across all outstanding loans in the CDS initiation year.
Tradedpost_Hi_ Cov_Restrict	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm's pre-existing loans in the CDS initiation year has relatively high level of covenant restrictiveness, and equals zero otherwise
Tradedpost_Low_ Cov_Restrict	An indicator variable that equals one if an observation occurs in the year of CDS initiation or thereafter and the firm's pre-existing loans in the CDS initiation year has relatively low level of covenant restrictiveness (or no pre-existing loans), and equals zero otherwise

Endnotes

[1] As explained in Section 2, CDS trading can create additional effects on managers' incentives to increase and decrease dividends that work through both the pecking-order and agency-cost channels. In particular, the development of a CDS market can provide new information to capital providers, thereby reducing information asymmetry between managers and current equityholders, as well as external capital providers. Reduced information asymmetry can lessen the pecking-order problem, thereby increasing dividends, but also can reduce agency conflicts between managers and equityholders, thereby decreasing dividends.

[2] Regarding costs, in 2003, Warren Buffet referred to CDSs a "weapons of mass destruction" in his letter to shareholders of Berkshire Hathaway (see http://www.berkshirehathaway.com/letters/2002pdf.pdf). Buffet's prophecy gained credence, as research suggests that CDSs were a major contributing factor to the 2007–2008 Financial Crisis (e.g., Stulz 2010). Regarding benefits, in 2004, former Federal Reserve Chairman Alan Greenspan advocated support for CDSs, noting the role they play as efficient vehicles for transfer of credit risk (Greenspan 2004).

[3] For a dividend to be a credible commitment, the payout policy must commit the manager to pay out excess free cash flow in future periods. Prior literature establishes that firms are reluctant to cut or omit dividends—that is, dividends are sticky (Guttman et al. 2010). Given this is the case, if managers increase dividend payout, such an increase represents a long-term commitment not to overinvest. Assuming managers are reluctant to cut or omit dividends, increasing dividend payout creates greater incentives for managers to avoid overinvesting. Overinvesting today could leave the firms with a future cash shortfall, thereby creating pressure to cut or omit dividends, which managers seek to avoid at all costs. As a result, dividends can play an important role in mitigating agency costs associated with excess free cash flow (Lang and Litzenberger 1989, Faccio et al. 2001, Knyazeva 2008).

[4] For example, James (1987) finds a positive stock market reaction to loan announcements by borrowers, and Lummer and McConnell (1989) find a positive stock market reaction to positive loan-agreement revisions. In addition, Harvey et al. (2004) find evidence that bank debt, which provides monitoring of managerial behavior, creates value for equityholders because it reduces agency costs associated with overinvestment. These studies' findings are consistent with equityholders benefiting from banks' monitoring by reducing managerial agency costs (Harford et al. 2014).

[5] Loan agreements often require borrowers to disclose timely material information to lenders, such as revenue projections or plans for acquisitions or dispositions. This information, which generally is available to other investors on a less timely basis, can be revealed indirectly by lenders' trading in CDS markets.

[6] Hail et al. (2014) predicts and finds evidence that dividends decrease after two information shocks that reduce information asymmetry between managers and equityholders: the introduction of International Financial Reporting Standards and the initial enforcement of insider trading laws.

[7] To ensure comparability across years, we adjust *DPS* for stock splits using the cumulative adjustment factor in Compustat. Using dividends per share, rather than dividend yield or dividend payout ratio, ensures that the observed changes in *DPS* reflect changes in dividends rather than the deflator (Floyd et al. 2015). However, untabulated results reveal that our main inferences unchanged using dividend yield and dividend payout ratios.

[8] Because we cannot assign a specific treatment date for each control firm, we estimate Equation (1) using the Bertrand and Mullainathan (2003) difference-in-differences design.

[9] Including the lagged dependent variable in the regression could induce bias to the coefficients of interest. To address this issue, we also estimated Equation (1) using the Arellano and Bond (1991) Generalized Methods of Moments estimator. Untabulated findings yield the same inferences as those based on tabulated findings.

[10] We also estimated Equation (1) clustering by firm and year. Untabulated findings yield the same inferences as those based on tabulated findings.

[11] Following Ashcraft and Santos (2009), Subrahmanyam et al. (2014), and Amiram et al. (2017), we match each CDS-traded firm to a non-CDS-traded firm based on firm characteristics for both sets of firms as of the year in which CDS initiation occurs. We estimate the propensity score model using all CDS-traded firms' yearly observations between 2001 and the date of CDS initiation for each firm and all potential control firms' yearly observations between 2001 and 2014. Following Ashcraft and Santos (2009), we begin the propensity score estimation sample in 2001 because this is the earliest year in which a CDS initiation occurs in our sample.

[12] We eliminate all firms that have a CDS initiation date in January 2001 because the IHS Markit database begins its coverage then, and, thus, the CDS initiation date for these firms is ambiguous.

[13] Throughout, when discussing a coefficient or summary statistic, we use the term significant to denote a 5% significance level under a two-sided alternative.

[14] A key assumption of our research design is that the dependent variable in Equation (1) follows a parallel trend for CDS and non-CDS-traded firms. However, the statistics in Table 3 showing that CDS-traded firms differ significantly from non-CDS-traded firms along several dimensions suggests the possibility that the parallel trend assumption may not hold. Therefore, as discussed in Section 5.1.3, we conduct analyses related to parallel trends.

[15] Untabulated statistics reveal that the number of CDS-traded firms used in the propensity score-matched sample tests is 628. The loss of 16 firms is largely attributable to missing data for CDS-traded firms necessary to estimate the probit model of the likelihood of CDS trading.

[16] Although some significant differences in firm characteristics between CDS- and non-CDS-traded firms remain after matching, most of the differences are economically small. See the Internet Appendix Table A1 for descriptive statistics of firm characteristics for the propensity score-matched sample.

[17] It is possible that there is a spurious relation between CDS initiation and dividend payout arising from CDS-trading initiation dates being clustered in time. Untabulated statistics reveal that 60% of CDS firms have trading initiation dates in the period 2001–2003. Following Bekaert et al. (2005) and Chang et al. (2019), we address this concern by randomly assigning the year of CDS-trading initiation for our 644 CDS traded firms to 644 randomly chosen firms in our full sample and then estimating Equation (1) using this sample. We repeat this procedure 1,000 times. Untabulated findings reveal that the *TradedPost* coefficient in Table 5, column (1), exceeds even the largest *TradedPost* coefficient obtained from the 1,000 estimations with randomly assigned CDS-trading dates. These findings suggest that our tabulated findings are not affected by event clustering and any associated time trend. We also estimated Equation (1) limiting the sample to include only firms that paid regular dividend before CDS initiation. Findings presented in the internet appendix reveal the same inferences regarding the *TradedPost* coefficients in Table 5.

[18] We construct *Lender_FX* as described in Amiram et al. (2017) using data from Dealscan and Federal Reserve Call Reports. See Amiram et al. (2017) for details. We set *Lender_FX* to zero if the bank's foreign exchange information is missing.

[19] Specifically, we regress *TradedPost* on the predicted value of *TradedPost* from the Probit model and the control variables, including the second-stage regression fixed effects. The fitted value from this regression is then used in the second stage of the standard least-squares model for *DPS*.

[20] We also estimate the Table 7 regressions using propensity score-matched samples. Untabulated findings yield the same inferences as those based on the Table 7 findings. In addition, we use propensity score-matched samples for the analyses underlying Table 9. Untabulated findings yield the same inferences as those based on tabulated findings. See Internet Appendix Tables A2 and A3 for tabulated findings.

[21] We also test whether the *TradedPost* coefficients for firms in the high- and low-liquidity subsamples in columns (1) and (2) are significantly different. The untabulated χ^2 statistic, 15.11, indicates that the *TradedPost* coefficients differ at less than the 0.01 level.

[22] Subrahmanyam et al. (2017) find that CDS trading also can affect cash holdings. As a result, we also estimate Equation (1) in a simultaneous equations framework in which capital structure, cash holdings, and dividend payout are simultaneously determined. Untabulated findings reveal the same inference that dividends increase after CDS initiation (*TradedPost* coefficient = 0.038; *t*-statistic = 2.68).

[23] Our findings in Table 5 do not rule out the possibility of CDS initiation reducing information asymmetry (reducing monitoring), thereby resulting in a decrease in dividends through the agency-cost channel (through the pecking-order channel). Nonetheless, the finding that dividends increase following CDS initiation suggests that the effects of dividend decreasing forces are dominated by the effects of dividend increasing forces.

[24] *ROA/(1–ROA)* reflects the maximum growth rate of a firm if it only relies on internal financing. To see this, let x be the firm's external financing needs and b be the faction of earnings, E, retained for investment. Thus, $x = g \times ASSETS - (1 + g) \times E \times b$, where g is a firm's growth rate. Setting x and b to zero and one—that is, the situation when a firm only internally finances its projects and has no payout of earnings—then $g = E/(A - E)$, or, equivalently, $g = ROA/(1 - ROA)$. In addition, the industry median asset growth rate can be interpreted as an estimate of the long-term growth rate in equilibrium for firms in an industry. As a result, *FCF* measures the extent to which a firm's capacity to generate funds internally exceeds its long-term equilibrium growth rate. The greater the value, the higher the probability that the firm generates excess funds.

[25] We also use a second measure of free cash flow that is commonly calculated as operating cash flow less capital expenditure, deflated by beginning-of-year total assets (Richardson 2006). Untabulated findings reveal the same inferences as those based on tabulated findings.

[26] We require the lending relationships originated before CDS initiation and are still outstanding for at least a year following CDS initiation.

[27] Market share in the loan-syndication market is commonly employed as a measure of bank reputation. See, for example, Sufi (2007), Ball et al. (2008), and Amiram et al. (2017). We obtain bank market share information from SDC Platinum.

[28] If covenants are violated, presumably because of performance deterioration, lenders can intervene on a timely basis to protect themselves by requiring borrows to take a variety of corrective actions, including cutting investment or replacing the CEO (e.g., Chava and Roberts 2008 and Nini et al. 2009).

[29] As noted in Amiram et al. (2017), syndicate participants are less likely than lead arrangers to purchase CDSs. Because their objective is to generate interest revenue from the loans, purchasing CDSs would reduce their exposure to loans at a cost of sacrificing their net revenue. In contrast, the lead arranger's primary objective is to generate origination fees and, therefore, prefers to have minimal exposure to the borrower's credit risk.

[30] An important caveat regarding the free cash flow test, as well as the other two tests relating to reduced monitoring, as an explanation for the increase in dividends following CDS initiation is that the partitioning variables we construct are not random and subject to endogenous choice. However, finding consistent evidence increases our confidence that reduced monitoring following CDS initiation contributes to the increase in dividends we document.

[31] We use a text-based financial constraint measure rather than those based on financial data because, as Hoberg and Maksimovic (2015, p. 1312) note, such measures "rely on potentially unstable reduced-form predictive models estimated on small samples using accounting ratios, which are then applied out of sample to materially different populations of firms." Another limitation to using financial data-based measures in our study is that such measures, particularly the KZ Index (Kaplan and Zingales 1997), typically use dividends as an input to the predictive models. We are grateful to Gerard Hoberg for sharing the financial constraint data on his website, http://faculty.marshall.usc.edu/Gerard-Hoberg/MaxDataSite/.

[32] The findings in Table 9 provide evidence of reduced monitoring working through the agency-cost channel and new information revelation working through the pecking channel contributing to the increase in dividends following CDS initiation. The internet appendix presents evidence that after controlling for the effect of one channel, the effect of the other channel remains significant in explaining the increase in dividends following CDS initiation, although the reduced monitoring effect through the agency-cost channel is stronger.

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