INTERNET APPENDIX

Credit Default Swaps and Firm Cyclicality

TABLE IA.1

Summary Statistics for the Raw Sample

This table provides the summary statistics for the major variables used in our study for CDS firms and all non-CDS firms for the raw (non-PSM matched) sample. The sample period is from Q4 2000 to Q4 2018. The definitions of the variables are provided in Appendix A. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Variable	CDS firms			Non-CDS firms			Difference in mean (Non-CDS − CDS)
	Number of observations	Mean	SD	Number of observations	Mean	SD	
AG	33,832	0.014	0.084	232,233	0.019	0.148	0.005***
EG	9,265	0.022	0.197	63,505	0.071	0.401	0.049***
Size	33,832	9.143	1.252	232,233	5.752	1.904	-3.391***
Net PPE	33,832	0.350	0.246	232,233	0.256	0.249	-0.094***
Leverage	33,832	0.323	0.178	232,233	0.206	0.222	-0.117***
Working Capital	33,832	0.110	0.142	232,233	0.273	0.266	0.163***
Cash	33,832	0.093	0.101	232,233	0.233	0.250	0.140***
Asset Turnover	33,832	0.228	0.167	232,233	0.244	0.198	0.016***
Retained Earnings	33,832	0.155	0.565	232,233	-0.857	2.717	-1.012***
ROA	33,832	0.011	0.027	232,233	-0.019	0.083	-0.030***
Volatility	33,832	0.343	0.197	232,233	0.591	0.343	0.248***
Excess Return	33,832	0.043	0.366	232,233	0.049	0.594	0.006***
Investment-grade	33,832	0.362	0.481	232,233	0.037	0.189	-0.325***
Rated	33,832	0.465	0.499	232,233	0.086	0.281	-0.379***
Market to Book	33,832	1.698	0.861	232,233	2.055	1.653	0.357***

Robustness Tests

1. Propensity-Weighting Approach

As the number of CDS firms is small in comparison to the total number of firms, the PSM approach used in the main analyses reduces sample size significantly. Following Bartram et al. (2022), we re-estimate our baseline regressions using the propensity weighting approach, which uses every observation in the sample with a positive probability of being included in both the treated and control groups. Instead of matching, we use the estimated propensities to weight observations in the sample to achieve balance in treated and control firms.[1]

Panel A of Table IA.2 presents the results from the propensity-weighted sample. Clearly, the moderating effect of CDS trading on firm cyclicality remains negative and significant.

2. Sub-Period Analysis

CDS contracts were initially conceived as a hedging tool for firms' creditors to manage credit risk. Big shocks in financial markets, such as financial crises, may temporarily or fundamentally change investors' and firms' risk attitudes and thus have short-term or long-term impact on the behavior of exacting creditors and firms. As the cyclicality-reducing effect of CDS trading documented in this study results from firms' precautionary response to potential threats (actions) of exacting creditors, it may be influenced by financial crises. Using the 2007-08 global financial crisis as an experiment, we investigate whether such influence can be detected in the data. Specifically, we split the full sample period into two sub-periods: one that starts in Q4 2000 and ends in Q2 2007, and the other that starts in Q3 2007 and ends in Q4 2018. We find, in Panel B of

[1] See Bartram et al. (2022) for details of the propensity weighting approach.

Table IA.2, a negative and significant coefficient of the interaction term for both sub-periods, suggesting that the cyclicality-reducing effect of CDS trading remains in the aftermath of the global financial crisis.

3. Outstanding CDS Positions and Firm Cyclicality

The dummy variable $CDSTrading$ does not distinguish CDS firms with large outstanding CDS positions from those with small positions, nor does it capture the dynamics of outstanding CDS positions for a given CDS firm. To explore the outstanding CDS position heterogeneity across CDS firms and over time, we obtain detailed CDS position information from the Trade Information Warehouse of the Depository Trust & Clearing Corporation (DTCC). The DTCC discloses both the aggregate gross notional CDS positions (gross amount), as well as the aggregate net notional positions (net amount) on a particular reference entity with a weekly frequency from October 31, 2008.[2] We focus on the net notional amount, as it is a more meaningful measure of the amount of credit risk transferred by CDS contracts and thus more relevant to the exacting credit problem. We define a new variable, $Net\ CDS = ln(net\ amount + 1)$ and re-estimate our baseline regression, replacing $CDSTrading$ with $Net\ CDS$. Panel C of Table IA.2 shows the regression results in column (1). The coefficient of the interaction term is negative and significant, showing that our main results are robust to using the continuous measure of outstanding CDS positions. As an additional robustness check, instead of using $Net\ CDS$ we use $Gross\ CDS = ln(gross\ amount + 1)$ in the regression in column (2) and obtain similar results.

[2] For a particular reference entity, the gross notional amount is calculated as the sum of all long (or equivalently, short) CDS contracts. Similarly, the net notional amount is calculated as the sum of net protection bought by counterparties that are net buyers of protection.

TABLE IA.2

Robustness Tests

This table presents the results of a set of robustness tests. The dependent variable is firm asset growth (*AG*). For Panel A, the sample consists of CDS firms and all non-CDS firms. For Panels B and C, the sample consists of CDS firms and the propensity-score matched non-CDS firms. The control variables are the same as those used in specification (4) of Table 2. All variables are defined in Appendix A. Independent variables, except ΔGDP, are one-period lagged. Panel A reports the regression results for CDS firms and all non-CDS firms, using the propensity-weighting approach as in Bartram et al. (2022). The sample period is from Q4 2000 to Q4 2018. Panel B reports results of sub-period regressions. In column 1, the sample period is from Q4 2000 to Q2 2007 and in column 2 the sample period is from Q3 2007 to Q4 2018. Panel C reports the baseline regression results, in which the dummy variable $CDSTrading$ is replaced by measures of outstanding CDS amount. Outstanding CDS amount is measured as $Net\ CDS$ in column 1 and as $Gross\ CDS$ in column 2. The sample period is from Q4 2008 to Q4 2018, as the DTCC data is not available before Q4 2008. Heteroskedasticity-robust t-statistics adjusted for clustering within firms are reported in brackets. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Propensity-weighting approach as in Bartram et al. (2022)

Dep. Var.: *AG*	(1)	(2)
CDSTrading × Δ*GDP*	-0.670***	-0.605***
	[-4.68]	[-4.56]
CDSTrading	0.001	0.010***
	[0.84]	[3.77]
Δ*GDP*	1.322***	0.813***
	[15.85]	[10.53]
Constant	0.006***	0.226***
	[5.76]	[12.84]
Controls	No	Yes
Firm Fixed Effects	No	Yes
Number of observations	241,311	241,110
R^2	0.007	0.048

Panel B: Sub-period analysis

Dep. Var.: *AG*	(1) Q4 2000 to Q2 2007	(2) Q3 2007 to Q4 2018
CDSTrading × Δ*GDP*	-0.730**	-0.671***
	[-2.56]	[-3.76]
CDSTrading	0.012**	-0.005
	[2.57]	[-1.16]
Δ*GDP*	0.824***	1.575***
	[4.45]	[10.30]
Constant	0.372***	0.324***
	[5.10]	[8.49]
Controls	Yes	Yes
Firm Fixed Effects	Yes	Yes
Number of observations	22,560	32,290
R^2	0.065	0.060

Panel C: Outstanding CDS positions and cyclicality

Dep. Var.: *AG*	(1) Net CDS	(2) Gross CDS
Net CDS × Δ*GDP*	-0.016**	
	[-2.00]	
Net CDS	0.000	
	[1.05]	
Gross CDS × Δ*GDP*		-0.014**
		[-1.98]
Gross CDS		0.000
		[1.00]
Δ*GDP*	1.234***	1.233***
	[12.72]	[12.72]
Constant	0.319***	0.319***
	[8.34]	[8.34]
Controls	Yes	Yes
Firm Fixed Effects	Yes	Yes
Number of observations	30,731	30,731
R^2	0.055	0.055

Asset Growth Anomaly

We also examine whether the cyclicality-reducing effect of CDS trading affects the relation between asset growth and stock returns. Cooper, Gulen, and Schill (2008) document the asset growth anomaly, implying that firms with high asset growth rates earn subsequently negative risk-adjusted returns. The authors show evidence that the negative abnormal returns of high-growth firms are consistent "with the idea that the asset growth effect arises in part from managerial overinvestment and related investor underappreciation of managerial empire building." Following Cooper, Gulen, and Schill (2008), we predict that if CDS trading indeed reduces unhealthy growth (e.g., overinvestment and/or empire building) the negative asset growth effect on stock returns should be weaker for CDS firms. We first estimate Model 1 from Table III of Cooper, Gulen, and Schill (2008) and then add $CDSTrading \times AG^{annual}$ and *CDSTrading* as additional explanatory variables. Table IA.3 reports the results. We use yearly data for this analysis to obtain comparable results with those in Cooper, Gulen, and Schill (2008).

The negative and highly significant coefficient of AG^{annual} in column (1) confirms the asset growth anomaly during our sample period. As shown in column (2), CDS trading has a dampening effect on the anomaly, reducing the absolute magnitude of the AG^{annual} coefficient by 58%. This finding indicates that the cyclicality-reducing effect of CDS trading is beneficial and value enhancing, which is in line with our hypothesis.

TABLE IA.3

CDS Trading and the Asset Growth-Stock Return Anomaly

This table presents the results of regressions of yearly stock return (*Return*) on yearly asset growth (AG^{annual}), and control variables in column 1 and on an interaction term between *CDSTrading* and AG^{annual}, and control variables in column 2. AG^{annual} is the asset growth defined as the percentage change in total assets from the fiscal year ending in calendar year $t-2$ to fiscal year ending in calendar year $t-1$. BM is calculated using the Compustat data in the fiscal year ending in calendar year $t-1$. MV is the June (t) market value, BHRET6 is the buy-and-hold return over January (t) – June (t), BHRET36 is the 36-month buy and hold return over July ($t-3$) to June (t). The sample consists of CDS firms and the propensity-score matched non-CDS firms. The sample period is from 2001 to 2018. Heteroskedasticity-robust t-statistics adjusted for clustering within firms are reported in brackets. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Dep. Var.: *Return*	(1)	(2)
AG^{annual}	-0.102***	-0.111***
	[-5.88]	[-5.24]
CDSTrading× AG^{annual}		0.064***
		[3.20]
CDSTrading		0.133***
		[8.14]
BM	-0.658	-0.689
	[-1.22]	[-1.31]
MV	-0.242***	-0.259***
	[-15.53]	[-15.90]
$BHRET6$	0.076***	0.079***
	[3.55]	[3.67]
$BHRET36$	-0.004	-0.000
	[-0.80]	[-0.03]
Constant	3.652***	3.826***
	[16.14]	[16.43]
Firm Fixed Effects	Yes	Yes
Number of observations	12,041	12,041
R^2	0.113	0.119