Do Financial Market Developments Influence Accounting Practices?
Credit Default Swaps and Borrowers' Reporting Conservatism

Guojin Gong
Pennsylvania State University
Email: gug3@smeal.psu.edu

Xiumin Martin
Washington University in St. Louis
Email: xmartin@wustl.edu

Sugata Roychowdhury*
Boston College
Email:sugata.roychowdhury@bc.edu

Abstract

This paper investigates whether the initiation of trading in credit default swaps (CDSs) on a borrowing firm's outstanding debt is associated with a decline in that firm's reporting conservatism. Contracting theory predicts that lenders' asymmetric payoffs generate a demand for conservatism, in particular the asymmetric timeliness of loss recognition. CDS investments can modify lenders' payoffs on their loan portfolios by providing insurance on negative credit outcomes. We examine the possibility that the onset of CDS trading reduces lenders' demand for conservatism from borrowing firms. Empirical results obtained using a differences-in-differences research design show a reduction in borrowing firms' reporting conservatism after CDS trade initiation. Furthermore, the decline in conservatism after CDS trade initiation is more pronounced in instances when reputational costs lenders face from reducing monitoring of financial statements are likely to be lower, when debt contracts outstanding at the time of CDS trade initiation have more financial covenants, and when lenders are more likely to have entered into CDS contracts on underlying borrowers.

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* Corresponding author

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Abstract

This paper investigates whether the initiation of trading in credit default swaps (CDSs) on a borrowing firm's outstanding debt is associated with a decline in that firm's reporting conservatism. Contracting theory predicts that lenders' asymmetric payoffs generate a demand for conservatism, in particular the asymmetric timeliness of loss recognition. CDS investments can modify lenders' payoffs on their loan portfolios by providing insurance on negative credit outcomes. We examine the possibility that the onset of CDS trading reduces lenders' demand for conservatism from borrowing firms. Empirical results obtained using a differences-in-differences research design show a reduction in borrowing firms' reporting conservatism after CDS trade initiation. Furthermore, the decline in conservatism after CDS trade initiation is more pronounced in instances when reputational costs lenders face from reducing monitoring of financial statements are likely to be lower, when debt contracts outstanding at the time of CDS trade initiation have more financial covenants, and when lenders are more likely to have entered into CDS contracts on underlying borrowers.

Keywords: credit default swaps, timely loss recognition, conservatism, financial market developments, lender monitoring

JEL codes: G1, G2, G21, G30, M40, M41, M44

1. Introduction

This paper investigates the influence of financial developments in the capital markets on accounting practices. Financial market developments can affect the payoffs and incentives of existing contractual parties to the firm. Since contractual considerations are important determinants of accounting practices (Watts and Zimmerman 1986), an altered contractual environment can induce changes in these practices. The financial market innovation we focus on is credit default swaps (CDSs), widely used in recent times to hedge and manage lenders' credit risk exposures. The accounting practice we study is conservatism, in the context of the borrower-lender relationship. Our primary interest is in examining whether the advent of CDS trade initiation on a firm's outstanding debt is associated with a change in that firm's reporting conservatism.

The credit default swap is a contract in which the buyer, generally called the protection buyer, makes a series of payments to the seller, generally called the protection seller. In exchange, the protection buyer receives a payoff from the protection seller if a credit instrument (such as a loan or a bond) goes into default or experiences any other "credit event" specified in the CDS contract (such as restructuring, bankruptcy, or credit-rating downgrade). By acquiring a CDS contract, the protection buyer transfers the credit risk associated with its investment (such as a loan or a bond) to the protection seller while retaining legal ownership of the investment.

Buying protection against credit risk exposures can yield benefits to banks with respect to regulatory requirements. BASEL II states that by entering into CDS contracts, a bank can substitute the credit risk of the borrower by the credit risk of the CDS seller in computing risk-weighted assets (BASEL II, page 49, Article 141). CDS purchases therefore imply a reduction in banks' credit risk exposure and less regulatory capital committed to the loan, which in turn frees capital for other productive investments. For example, AIG states in its Annual Report that at the end of 2009 it had $150 billion in notional CDSs outstanding, which it wrote to provide regulatory capital relief to financial institutions for their corporate loans (Saretto and Tookes 2013). The overall CDS market has grown tremendously in recent years, with the notional amount increasing from $180 billion in 1998 to $57 trillion at the end of June 2008 (Stulz 2010).[1]

Investments in CDS contracts by banks seeking to hedge credit risk exposures to their clients can have an influence on the reporting practices of those clients. Upon granting a loan, lenders assume an asymmetric payoff on their investment: if the borrowing firm remains solvent, lenders receive their principal and earned interest, while bankruptcy entitles them to the orderly liquidation value of the borrower. The literature argues that this asymmetric payoff underlies lenders' demand for conservatism in the reported financial statements of the borrower (Watts and Zimmerman 1986, Watts 2003). Lenders demand conservative reporting because it requires stricter verification standards for recognizing good news in earnings relative to bad news, thus yielding a book value for the firm that can serve as a lower-bound estimate for its orderly liquidation value.

The conceptual link between lenders' asymmetric payoffs and conservatism is more complex when CDS contracts are available on the underlying borrower's outstanding debt. If lenders enter into CDS contracts, their "downside" payoffs are crucially altered. In the event of borrower insolvency (in practice, any pre-specified credit event in the CDS contract), lenders are now entitled to settlement payouts from CDS sellers. To the extent that lenders' claims are less asymmetric as a consequence of their CDS investments, their demand for conservatism is

[1] The size of the CDS market fell sharply in the second half of 2008 in the wake of the financial crisis, but was still high at $41 trillion at the end of 2008. The Bank for International Settlements (BIS) has statistics on the CDS market since the end of 2004 based on survey data. See http://www.bis.org/statistics/derstats.htm.

expected to diminish. Any reduction in the demand for conservatism from lenders is unlikely to be replaced by an offsetting demand for conservatism from CDS sellers because CDS sellers do not own control rights with respect to the underlying loan and typically eschew any direct involvement with borrowers. However, it is possible that lenders bear reputation costs arising from any negative credit event attributable to reduced demand for conservatism on their part, which can conceivably motivate them to maintain their demand. The goal of this study is to investigate whether, and under what circumstances, there is a decline in the reporting conservatism of borrowers when CDS contracts on their outstanding debt become available to lenders.

We identify a sample of 529 firms who experience CDS trade initiation between 2002 and 2009. The empirical exercise essentially involves the identification of an event, CDS trade initiation, and an examination of whether there is a change in conservatism around this event. To control for selection bias and endogeneity, we follow a propensity score matching approach, as in Ashcraft and Santos (2009). This involves constructing a model for predicting CDS trade initiation as the first step. The first stage model indicates that CDS contracts are more likely to become available for firms with better credit rating, higher leverage, higher profit margin, larger size, and lower return volatility. These results suggest that adverse selection concerns in the CDS market create a bias towards firms that have better credit quality and are more transparent. The second stage analysis involves the computation of propensity scores from the first stage predictive model to construct a sample of 525 unique matched firms from the same industry that have no CDS trading throughout the sample period, and the estimation of a difference-in-difference regression. Specifically, we compute the change in conservatism from the two years prior to CDS-trade-initiation year (the event year) to the two years after the event year for firms with CDS trading on their debt, and compare that change to the corresponding change for matched firms.

We define conservatism as the asymmetric requirement of weaker verification standards for recognizing losses than for recognizing gains. We measure conservatism as the greater timeliness of earnings with respect to negative returns relative to positive returns (Basu, 1997). In robustness tests, we also use Basu's (1997) asymmetric earnings persistence as another measure of accounting conservatism. We find results consistent with our primary hypothesis: the initiation of CDS trading is associated with a decline in the financial reporting conservatism of underlying firms. The results indicate that asymmetric timeliness of loss recognition declines by around 20 percent after the onset of CDS trading. The decline seems economically significant and is statistically significant at the 5 percent level.[2]

In cross-sectional analyses, we reason that a decline in reporting conservatism of underlying borrowers should be more prominent when lenders face lower reputation costs from the potentially adverse consequences of lowering their demand for conservatism, such as client underperformance. Theoretical work by Parlour and Winton (2013) and empirical evidence in Ashcraft and Santos (2009) suggest that reputation costs to lenders from reducing monitoring of borrowers after acquiring CDSs are lower when the underlying borrowers are already more informationally opaque and riskier. Additionally, if lenders indeed lower monitoring, particularly with respect to conservatism in financial statements, then borrowers with poorer ex ante credit quality are expected to be more responsive to such a reduction. Indeed, the evidence indicates that the decline in conservatism is more pronounced when borrowers are smaller and carry speculative-grade credit ratings.

[2] For comparison of magnitudes, Ettredge, Huang and Zhang's (2012) findings imply a 46 percent increase in asymmetric timeliness of earnings following earnings restatements.

Our cross-sectional tests also indicate a greater decline in conservatism at the time of CDS trade initiation when borrowers' outstanding private debt at that time includes more financial covenants. The result suggests that borrowers are more responsive to any reduction in lenders' demand for conservatism when existing debt contracts are more reliant on financial covenants, since conservative reporting is generally thought to accelerate covenant violation (Zhang 2008).

CDS trade initiation is observable for a wide sample of firms, but we do not observe the actual acquisition of CDS contacts by lenders. To address this issue, we identify in cross-sectional tests situations with a greater likelihood of lenders entering into CDS contracts on their clients. In the first set of cross-sectional tests, we identify banks lending to the CDS firms in our sample and partition our sample based on whether these banks exhibit (a) an increase in the proportion of their assets bearing lower than 100% risk weights or (b) an increase in their CDS holdings in the same year as CDS trade initiation on the underlying borrower.[3] We expect that in years that banks increased the proportion of their assets bearing lower risk weights or their overall CDS holdings, they are more likely to have taken advantage of CDS trade initiation on a borrower to hedge their exposure to that borrower. We find that a decline in conservatism after CDS trade initiation is indeed more pronounced when either of the two conditions is satisfied.

Further analysis reveals that the decline in borrower conservatism we observe is unlikely to be driven by any changes in conservatism anticipated at the time of CDS trade initiation. Finally, our results are robust to using a measure of conservatism that relies on earnings time-series properties (Basu 1997) and not on equity returns.

[3]According to Basel II, a risk weight of 150% is assigned to loans rated below BB-, 100% to loans rated above BB- but below AA-, and 20% for loans with CDS protection where CDS sellers are rating above AA-.

The primary contribution of this study is in providing evidence that developments in financial markets, by altering the payoffs to contractual parties, can influence financial reporting practices. Specifically, the development of a CDS market in a firm's outstanding debt can be associated with a decline in that firm's reporting conservatism, presumably reflecting a decline in lender monitoring of financial statements.

The rest of the paper proceeds as follows. Section 2 discusses related literature and develops testable hypotheses. Section 3 describes sample selection and presents descriptive statistics. Section 4 introduces variable measurement and empirical methods. Section 5 reports empirical findings. We conclude in section 6.

2. Related literature and hypothesis development

2.1 The CDS market

CDSs are typically written on specific securities issued by firms, for example public bonds outstanding. They provide a convenient channel for hedging to lenders, even when the financial instruments (i.e., loans) responsible for lenders' credit risk exposures to the underlying borrowers are distinct from the specific securities (i.e., bonds) the CDS contracts are written on. Lenders usually make payments to CDS sellers in the form of insurance premiums expressed as an annualized percentage of the notional value of the transaction. For example, if the CDS spread of the underlying firm is 0.5 percent, a bank buying $10 million worth of protection from the CDS seller must pay the seller $50,000 per year. These payments continue until either the CDS contract expires or until the occurrence of a pre-specified credit event (e.g., default, bankruptcy, credit-rating downgrade or restructuring).[4]

CDS contracts are typically available to lenders from two types of CDS sellers: (a) monoline insurers such as AIG and Ambac who primarily operate on the sell-side and (b) financial institutions and hedge funds including J.P. Morgan and Goldman Sachs who serve as market-makers. Both types of CDS sellers hedge their open risk exposures on CDSs across various derivative instruments and across numerous investors in each instrument (Weistroffer 2009). To the extent that lenders possess private information on their borrowers' credit-worthiness, CDS sellers can take into account their own information disadvantage when pricing CDS contracts (Fink 2004). Lenders pay the premium (arising out of information asymmetry) in exchange for three potential benefits. First, CDS contracts allow lenders to transfer the credit risk of the borrowing firm to the CDS seller in the event of default. For example, JP Morgan Chase reported $48 billion in notional CDS purchases for the purpose of hedging the credit risk of its loan portfolio in its 2009 Annual Report (Saretto and Tookes 2013). Second, the risk-shifting via CDS contracts allows lenders, particularly banks, to better manage their regulatory capital since the risk weight assigned to a loan can be based on the credit rating of the counter-party in the CDS contract rather than the original borrower.[5] Crucially, banks enjoy this benefit even in the absence of a default by the borrowing firm. Third, unlike loan sales, CDSs allow originating lenders to maintain lending relationship with the borrower while reducing the risk profile of their loan portfolio (Venokur, Magidson and Singe 2008, Saretto and Tookes 2013).

[4] Credit default swaps are generally documented using industry standard derivative master agreements and standard CDS terms, such as the International Swaps and Derivatives Association ("ISDA") 2002 Master Agreement and Credit Derivative Standard Terms. The 2002 ISDA Master Agreement is the most recent master agreement promulgated by the ISDA. The previous master agreement, the 1992 Master Agreement, is still in use. While the Master Agreements from 1992 and 2002 are similar, differences in specific contract language exist.

[5] BASEL II states that guarantees issued by or protection provided by entities with a lower risk weight than the counterparty exposure is assigned the risk weight of the guarantor or protection provider.

Generally CDSs are regarded as a positive financial market development, particularly for banks. By allowing lenders to shift credit risk exposures to a third party, CDS contracts are often viewed as facilitating better risk-sharing with the rest of the economy and economizing on regulatory capital (Deutsche Bank Research 2009). However, a key concern, discussed next, has been that the development of the CDS market can weaken lenders' incentives to monitor borrowers, which traditionally has been an important role of lending institutions such as banks.

2.2 Related literature

The literature on credit default swaps has centered on two predominant themes. One stream of literature investigates whether CDS investments generate cost savings for lenders that manifest in benefits passed on to their clients. Ashcraft and Santos (2009) examine whether CDS trade initiation is associated negatively with interest spreads that lenders demand from their corporate borrowers but fail to find evidence of a significant relation between the two. Saretto and Tookes (2013) mention the following supply market frictions that CDS contracts can help alleviate: lenders' ability to ease regulatory capital requirements, the separation of those who are willing to bear credit risk (CDS sellers) and those who have capital to lend (banks), the ability of banks to maintain client relationships while simultaneously offloading portfolio risk and finally, access to a loan resale market even for lenders who currently do not have CDS investments. They question whether the loan spreads examined by Ashcraft and Santos (2009) are the only dials that lenders turn when supply frictions are mitigated. Their tests reveal that S&P 500 firms with CDS contracts trading on their debt are able to maintain higher leverage ratios and longer debt maturities, consistent with such firms experiencing fewer supply-side frictions in obtaining loans.

A second theme explored in the literature is the possibility that, upon acquisition of CDS contracts, lenders ex post reduce the extent to which they monitor their borrowers (Duffee and Zhou 2001, Ashcraft and Santos 2009, Marsh 2009, Stulz 2010, Parlour and Winton 2013). An extreme manifestation of moral hazard in lender monitoring after CDS trade initiation is referred to as the "empty creditor" problem: lenders over-insured via CDS contracts become highly intransigent in debt renegotiations, with the objective of forcing bankruptcy or other negative credit events that would trigger CDS payments.[6]

Systematic empirical evidence regarding a decline in lender monitoring upon CDS trade initiation is limited. Marsh (2009) documents a less positive stock return reaction to borrowers announcing new loans from banks known to transfer credit risk via collateralized loan obligations (CLOs), consistent with the market anticipating weaker monitoring by such banks. He does not observe the same evidence with banks known to transfer risk via CDSs, but cautions that his sample is not well-suited to test the effect of CDSs on bank monitoring, since it excludes firms (reference entities) actively traded in the CDS market. Ashcraft and Santos (2009) find that debt financing costs are higher for risky and informationally opaque firms after the onset of CDS trading, which they interpret as evidence of a reduction in lender monitoring among such firms.

Comparing new debt agreements from the pre-CDS trade initiation period to the post-CDS period, Sustersic (2012) finds that the latter are more likely to include financial covenants; additionally the covenants tend to carry less "slack", which she interprets as a bonding mechanism that counters lenders' incentives to decrease monitoring post-CDS-trade-initiation. Interestingly, Sustersic (2012) finds no evidence of increased covenant violation probability in the post-CDS period in spite of the more numerous and tighter covenants. Since these covenants

[6] Bolton and Oehmke (2010) and Weistroffer (2009) report specific instances of firm bankruptcy in which the empty-creditor phenomenon played a major role. Stulz (2010) recognizes this "empty creditor" problem, but calls for more research on whether credit derivatives reduce social welfare in less extreme situations.

are based on numbers reported in the financial statements, Sustersic's (2012) results raise the possibility that borrowers report differently after CDS trade initiation. To our knowledge, the specific issue of whether lenders reduce their scrutiny of their borrowers' financial statements upon acquiring CDS contracts, or whether borrowers exhibit any change in their reporting practices, is unaddressed in the literature.

A related literature examines whether a decline in monitoring is evident when banks engage in other credit-risk-transfer mechanisms such as loan sales in the secondary market (Pennacchi 1988, Gorton and Pennacchi 1995, Ball, Bushman and Vasvari 2008, Bushman and Wittenberg-Moerman 2012). The CDS market differs from the loan sale market in some important respects. In a loan sale, both the risk exposure on the loan and control rights, including the right to monitor and administer the loans, are typically transferred to the loan buyer.[7] In contrast, in a CDS contract, the credit risk transfers to the CDS seller, but control rights remain with the original lender. Even in cases that loan sales are partial, as when lead arrangers bring in syndicate participants, the latter are in a better position to detect any shirking in monitoring by the originating lender than CDS sellers, who have no monitoring expertise or rights. Thus, the moral hazard issues are potentially more severe with CDS contracts.

2.3 CDS contracts and underlying borrowers' conservatism: primary hypothesis

If the onset of CDS trading indeed reduces lenders' incentives to monitor financial statements, we expect lenders to lower their demand for conservatism from such firms. Positive accounting theory points to the role of accounting conservatism in facilitating debt contracting by providing an efficient means for debt-holders to monitor their credit risk (Watts and Zimmerman 1986, Basu 1997, Watts 2003, Frankel and Litov 2008, Zhang 2008, Nikolaev 2010,

[7] Loan sales without recourse constitute the vast majority of transactions (see Gupta, Singh and Zebedee2008).

Ahmed et al. 2002, Gormley, Kim and Martin 2012, Tan 2013). Theoretically, since lenders face downside risk without capturing any upside potential, conservative financial reporting can mitigate lenders' risks by recognizing economic losses in a timelier manner than economic gains. Such asymmetric loss recognition timeliness ensures that borrowers' net asset values are not overstated and thus are more informative about borrowers' ability to repay future debt claims (Watts 2003). Ex post, asymmetric loss recognition timeliness can accelerate debt covenant violations (Zhang 2008, Nikolaev 2010) and constrain dividend overpayment (Ahmed et al. 2002), thus facilitating efficient debt contracting in the presence of agency costs. Accordingly, lenders' exposure to downside credit risk with a capped upside payoff is expected to generate a demand for asymmetric loss recognition timeliness (Watts and Zimmerman 1986).

When lenders acquire CDSs on firms that they have extended credit to, the asymmetric claims arising out of their loans are modified, because of the protection the CDS contract offers on the downside. A reasonable question that arises then is whether the mitigated loss upon borrower default weakens lenders' incentives to ensure that borrowers maintain conservative reporting practices by being asymmetrically timely in recognizing losses relative to gains. Lenders' weakened incentives to monitor the conservatism in borrowers' financial statements can manifest in several ways, including fewer requests for timely financial statements, fewer clarification requests regarding those statements and less frequent on-site visits to verify reported numbers.[8] Managers will likely respond to a lower lender demand for conservatism by reporting less conservatively.

Several factors motivate managers at borrowing firms to be responsive to a perceived reduction in lender demand for reporting conservatism. Managerial compensation is often linked

[8] As Arping (2012) argues, managers at borrowing firms can typically detect any weakening of monitoring intensity in general.

to earnings, for example via bonus plans. Conservative reporting, by delaying the recognition in earnings of gains relative to losses, introduces a deferred component to managers' compensation (see for example Watts 2003, Leone, Wu and Zimmerman 2006). It is also argued that reporting conservatism restricts managers' ability to operate or invest in projects that are potentially detrimental to the firm's health but generate private benefits for managers (Ball and Shivakumar 2005, Francis and Martin 2010). In addition, Roychowdhury (2010) points to the possibility that conservative reporting can weaken managers' incentives to invest in risky projects. Finally, conservative reporting can accelerate the pace of covenant violation (Zhang 2008), facilitating earlier transfer of control to lenders. Thus, if lenders indeed reduce their demand for conservatism, managers have incentives to respond by reporting less conservatively, either to reduce the deferred component of their compensation or to be less constrained in their investment decisions or to avoid covenant violation.

It is possible that a weakened demand for conservatism from lenders is substituted by an offsetting demand for conservatism from other parties, but it is questionable whether this occurs in practice. Consider, for example, CDS sellers. In practice, CDS sellers rarely are in a position to make informed decisions regarding the effectiveness of lender monitoring of financial statements, which is unobservable. Further, the absence of private contractual agreements between CDS sellers and underlying borrowers limits the ability of the former to monitor borrowers on an ongoing basis after CDS trade initiation. Rather, CDS sellers, the largest of whom are monoline insurers, typically follow the insurance principle and establish diversified portfolios of credit risk in which losses generated by one contract are compensated by premiums earned from other contracts. In particular, CDS sellers typically write protection policies for both lenders seeking to manage their credit exposures and rank speculators. Thus, even though CDS sellers are likely to charge premiums that are high enough to price-protect against informed CDS buyers and also against any moral hazard issues in monitoring on the part of lenders seeking to hedge, the price-protection is shared by both speculators and informed CDS buyers (such as lenders). In stark contrast to risk-diversified CDS sellers, bank loan portfolios are typically concentrated, for example, within business sectors and geographic regions (Duffee and Zhou 2001, Morrison 2005). Thus, CDS sellers have a greater tolerance for credit risk than lenders, with the consequence that any price protection by the former is unlikely to be too severe to deter the latter from entering into CDS contracts. This creates a situation where lenders acquire CDS contracts, reduce their demand for conservatism ex post, and the reduced demand is not offset by CDS sellers. It is conceivable that fiduciary agents such as the board of directors and auditors would prefer a consistent level of conservatism in borrowers' financial reporting even after CDS trade initiation. It is not obvious, however, that such parties are capable of completely substituting for the monitoring of financial statements by lenders.

There are possibly some factors that discourage banks from reducing their demand for conservatism after acquiring CDSs, for example, contractual provisions in the CDS specifying that the bank's claim on the underlying firm is junior to those of other parties. Further if lead arrangers reduce their demand for conservatism after acquiring CDSs, they may face reputation costs with current non-lead loan syndicate participants if the loans subsequently perform poorly.[9] Thus, an actual reduction in borrower conservatism after CDS trade initiation is an open empirical question. Accordingly, we test the following two-sided hypothesis:

H1 (null): *The onset of CDS trading in a firm is not associated with a reduction in the firm's reporting conservatism.*

[9] While CDS contracts and their specific provisions are unobservable to third parties, empirical proxies for lenders' reputation costs are suggested in the literature. Our cross-sectional analysis, described in Section 2.4.2 exploits this advantage.

2.4 CDS contracts and underlying borrowers' conservatism: cross-sectional hypotheses

2.4.1 The role of reputation costs

Conservatism is hypothesized to constrain activities that can reduce debt-holders' wealth, for example, asset substitution, excessive dividend payments and overinvestment. Lowering the demand for conservatism can thereby increase credit default risk. Even if lenders are at least partially protected against the financial consequences of such defaults by virtue of the CDS contracts, they can face reputation costs upon borrower default or any other negative credit event.

We expect that lenders' incentives to lower monitoring of financial statements after entering into CDS contracts are greater when reputation effects that would discourage them from reducing monitoring are weaker. To identify situations in which concerns regarding loss of reputation are less effective in providing lenders the impetus to maintain monitoring even after hedging their loan exposures, we rely on existing literature. In their theoretical work, Parlour and Winton (2013) argue that reputation effects in the CDS market will be weaker when riskier borrowers are involved. The intuition is as follows: if borrowers already deemed to be riskier were to default or experience any other credit event, it is more difficult for external parties to attribute this negative outcome to a lack of lender monitoring. Consequently, lenders are more likely to reduce monitoring of riskier borrowers after shifting the credit risk. The evidence in Ashcraft and Santos (2009) suggesting a more pronounced decline in lender monitoring among riskier borrowers post CDS-trade initiation is consistent with Parlour and Winton (2013). These arguments appear to apply in the loan syndication market as well. Gopalan, Nanda and Yerramilli (2011) find that reputation loss suffered by lead arrangers of syndicate loans in the event of borrower bankruptcies is lower when outstanding loans to the insolvent borrowers already have high yields (consistent with these loans already being deemed as high-risk). They reason that in such cases, bankruptcies are less attributable ex post to inadequate monitoring on the part of lead arrangers.

Given the evidence in both the CDS and loan syndication markets, we expect any decline in conservatism after CDS-trade initiation to be more pronounced for riskier borrowers with more opaque information environments. Firms that are respectively smaller in size and have credit ratings below investment grade are likely to be riskier firms with lower-quality information environments. Thus, we test the following prediction on cross-sectional variation in the post-CDS decline in borrower conservatism:

H2 (null): *Change in borrower conservatism after the onset of CDS trading is not any more pronounced for smaller borrowers and borrowers with credit rating below investment grade.*

2.4.2 The role of covenants

Existing studies argue that conservatism in financial statements and financial covenants in debt contracts play a joint role in lender monitoring. Zhang (2008) documents that firm who report more conservatively are timelier in violating covenants upon the realization of a negative event, proxied for by a negative price shock. *Ex ante*, firms reporting with greater conservatism appear to enjoy lower interest rates from their lenders, suggesting that lenders consider conservatism as a desirable trait in financial statements. Nikolaev (2010) documents a positive association between financial reporting conservatism and the presence of financial covenants in public debt contracts, interpreting this evidence as indicative of the complimentary role they play in facilitating timely transfer of control to lenders.

If, CDS trade initiation is associated with reduced lender-scrutiny of borrowers' reporting practices, then borrowers are expected to be more responsive to this reduced scrutiny when the expected costs of maintaining those practices are higher. Since conservatism is more likely to facilitate transfer of control to lenders in the presence of financial covenants, we expect borrowers to have the greatest incentives to lower conservatism when their existing debt contracts at the time of CDS trade initiation include more financial covenants. In formulating our hypothesis, we focus on the number of financial covenants in private debt contracts with banks. Private debt contracts are much more likely to include financial covenants than public debt (Begley and Freedman 2004, Chava and Roberts 2008), and banks/financial institutions are also more likely to hedge their underlying exposures via sophisticated derivative instruments such as CDSs (Acharya and Johnson 2007).

H3 (null): *Change in borrower conservatism after the onset of CDS trading is not any more pronounced for borrowers with a larger number of financial covenants in their existing private debt contracts at the time of CDS trade initiation.*

3. Sample Selection

3.1 Firms with traded CDS contracts

CDS contracts are traded in the over-the-counter (OTC) market, almost entirely populated by institutional investors. Unlike an organized exchange such as the NYSE, the information on CDS trading must be gathered from market participants on the basis of their voluntary participation in periodic surveys. We collect information on CDS contracts from Datastream. Datastream covers approximately 13,000 single-name CDS contracts for firms domiciled in 70 countries. Among U.S. firms, there are 8,041 single-name CDS contracts with either senior debt (93%) or subordinated debt (7%) as the underlying securities.[10] Datastream collects CDS data from two main sources: CMA Datavision CDS series and Thomson Reuters CDS series. We only focus on the CMA CDS series because Mayordomo, Pena and Schwartz (2011) find that CMA database quotes lead the price discovery process relative to quotes provided by other databases including Markit, GFI, Reuters EOD and JP Morgan. CMA in turn collects data directly from the trading desks of buy-side CDS market participants. Note that the CMA series are no longer offered through Datastream after the 3rd quarter of 2010. This change does not affect our empirical analysis, as our sample period ends in 2009.

We identify 1,193 U.S. firms that have single-name CDS contracts traded between January 2002 and December 2009. The CDS sample ends in 2009 to facilitate computation of asymmetric timeliness of loss recognition for at least one year after CDS trade initiation for all firms in the sample. For each of these firms, we identify the first fiscal year that the firm trades at least one US-dollar-denominated CDS contract. We merge these 1,193 firms with Compustat and CRSP to collect financial variables used in the subsequent empirical analyses.[11] After deleting financial firms and requiring all firms to have at least one observation during both pre- and post-CDS trade-initiation periods, we are left with 529 unique U.S. non-financial firms with required financial variables.

3.2 Matched control firms

[10] Single-name CDS contract is one where there is just one reference entity. The reference entity can be any borrower, but is most often one of a few hundred widely traded companies (corporate or financials) or a handful of governments (sovereigns). The CDS contract that we are interested in is the single-name one where the reference entity is a corporation. In addition to the single-name CDSs, there are basket default swaps (BDSs), index CDSs, and funded CDSs (also called a credit-linked notes) etc.

[11] The 1,193 firms include multiple subsidiaries for the same parent holding firms. For such firms, we collect financial variables for the parent holding firms only when merging with the Compustat and CRSP databases.

The initiation of CDS contracts balances credit risk preferences between the protection seller and the protection buyer. In particular, firms' credit risk and growth opportunities potentially influence the demand and supply of CDS contracts (Ashcraft and Santos 2009). To address this sample selection issue, we follow Aschcraft and Santos (2009) and implement the propensity score matching methodology developed in the literature. Specifically, we augment the model in Ashcraft and Santos (2009) and estimate the following logistic model to predict the initiation of CDS trading (firm subscripts are suppressed for brevity):

$$\begin{aligned} Prob(CDS_t = 1) = \Phi(&\beta_0 + \beta_1 INVESTMENT\ GRADE_{t-1} + \beta_2\ RATING_{t-1} + \beta_3\ LEV_{t-1} \\ &+ \beta_4\ PROFIT\ MARGIN_{t-1} + \beta_5\ SIZE_{t-1} + \beta_6\ RETURN\ VOLATILITY_{t-1} \\ &+ \beta_7\ MB_{t-1}) + \varepsilon_t \end{aligned} \quad (1)$$

where CDS is an indicator variable equal to one for firms with CDSs traded between 2002 and 2009, and zero otherwise. We include INVESTMENT GRADE, RATING, LEV, and PROFITMARGIN to account for firms' credit risk. INVESTMENT GRADE is an indicator variable equal to one if a firm has an S&P credit rating above BB+, and zero otherwise. RATING is an indicator variable equal to one if a firm has an S&P credit rating, and zero otherwise. We have tested robustness to using an ordinal variable capturing the credit rating of the firm, in lieu of the indicator variables INVESTMENT GRADE and RATING. All our subsequent results are robust to this alternative specification of the first stage model.

LEV is book leverage, equal to a firm's total debt (short-term debt plus long-term debt) scaled by total assets. PROFIT MARGIN is net income scaled by sales. We also include firm size (SIZE), return volatility (RETURN VOLATILITY), and market-to-book ratio (MB) to consider the effect of overall information environment and growth opportunities on the demand and supply of CDS contracts. SIZE is the natural logarithm of market value of equity. RETURN VOLATILITY is standard deviation of monthly stock return within a fiscal year, and MB is the ratio of market value of equity to total assets. For the sake of stable estimation, we use all Compustat firms with available information during the period 1997-2009. Specifically, for firms that do not have CDS traded by the end of 2009, we utilize all firm years from 1997 to 2008 when estimating Equation (1). For firms with CDS trading initiated during 2002-2009, we include observations from 1997 up to the last fiscal year prior to the CDS-trade-initiation year in estimating Equation (1).

Table 1 reports regression results of estimating Equation (1). As shown, the model specified in Equation (1) predicts the onset of CDS trading well, as evidenced by good model fit, high proportion of concordant pairs (91.5%) and low proportion of discordant pair (8.1%). The results indicate that firms with higher credit rating, leverage, profit margin and market cap, along with lower stock return volatility are more likely to have CDS trade initiation during the sample period. These findings are generally in line with an adverse selection explanation: given banks (potential protection buyers) possess superior private information about the debt instruments that they originated, the protection seller is more likely to offer CDS contracts for firms with lower credit risk (that is, firms with higher credit rating and higher profit margin) and a more transparent information environment (such as that of larger firms). The positive relation between leverage and the likelihood of CDS trade initiation suggests greater market demand of credit risk protection (via CDS contracts) for high leverage firms.

Next, we utilize a propensity score matching procedure to construct a control sample of non-CDS firms (i.e., firms with no CDSs trade during the sample period). Specifically, based on the estimation results of Equation (1), we obtain the estimated likelihood of CDS trade initiation for all Compustat firms. For each CDS firm (i.e., firms with a CDS trade during the sample period), we identify three non-CDS firms within the CDS firm's two-digit SIC industry that have the closest estimated likelihood to the CDS firm. The comparison of estimated likelihoods is made in the fiscal year prior to the year of CDS-trade-initiation.[12] We allow the same non-CDS firm to be matched to multiple CDS firms to minimize the distance in their propensity score.[13] The propensity score matching procedure generates 525 unique non-CDS-firm matches for the 529 CDS firms.

3.3. Descriptive statistics

Table 2 Panel A presents the sample distribution based on the CDS-trade-initiation year for the CDS sample and the matched non-CDS sample. The year 2004 witnessed the largest number of firms with CDS trade initiation (297 firms, or 56.1% of the CDS sample). The number of CDS trade initiations quickly declined afterwards for two reasons. First, since we select only the first traded CDS contract for each underlying firm, by construction we will observe a decline in the number of CDS trade initiation over time. Second, the drastic decline may also foreshadow the looming financial crisis — by the end of 2008, CDS trades were initiated on only 3 new firms (0.6% of the CDS sample). By construction, we observe similar distribution for non-CDS firms. Table 2 Panel B reports the sample distribution by industry. As shown, CDS firms are primarily concentrated in the rubber, stone, computer, and transportation equipment industries (23.6% of the CDS sample). In addition, 23.1% of all CDS firms belong to the food, apparel, petroleum refining, and paper and printing industries, while 20.2% belong to the railroad transportation and electric and gas industries.

Table 3 reports descriptive statistics of variables used in subsequent analyses across the CDS sample and the matched non-CDS sample. The two samples exhibit characteristics that are

[12] Our process of identifying more than one matching non-CDS firm for every CDS firm is similar to that in Lee (1997) and Chen and Martin (2011).

[13] We limit the distance in their propensity score within 20%. As a result, some CDS firms may have fewer than three matching non-CDS firms.

generally similar in economic magnitudes. However, there are a few statistically significant differences between the two samples. During the two-year period prior to CDS trading, CDS firms have slightly better earnings performance. In addition, CDS firms are significantly larger in market capitalization and exhibit lower growth potential (lower MB).[14] The differences in firm size and growth between CDS firms and non-CDS firms are similar during the two-year period *after* the onset of CDS trading, although earnings performance becomes statistically similar between these two groups of firms. The similar magnitudes of differences between firm characteristics across CDS and non-CDS firms in Panels A and B suggest that these characteristics are unlikely to be driving the increasing difference in conservatism between CDS and non-CDS firms as one moves from Panel A to Panel B.

We report Pearson and Spearman correlations among variables used in our empirical tests in Table 4. As shown in Column (7), the correlations between CDS (an indicator variable equal to one for CDS firms, and zero for non-CDS firms) and earnings performance, firm size, growth, and leverage confirm the univariate patterns observed in Table 3.

4. Empirical Methodology

4.1 Measurement of accounting conservatism

The aspect of conservatism we are interested in is the asymmetric timeliness of earnings in recognizing losses versus gains. We measure conservatism using the method developed in Basu (1997), that is, the greater timeliness of earnings with respect to negative returns relative to positive returns, which serves as our primary measure of conservatism. We follow Basu (1997)

[14] Note that the propensity score match controls for the extent to which a combination of these firm characteristics (SIZE, MB, LEV) contribute to the propensity of CDS trading initiation, rather than the individual characteristics.

in estimating the following pooled cross-sectional model with standard errors clustered at the firm level (firm subscripts are suppressed for brevity):

$$EPS_t = \beta_0 + \beta_1 D_t + \beta_2 R_t + \beta_3 D_t \times R_t + \varepsilon_t \quad (2)$$

where EPS is net income for fiscal year t scaled by year-beginning market value of equity; R is the 12-month compound stock returns ending three months after the end of fiscal year t; D is a indicator variable equal to one if R is negative, and zero otherwise.

Basu (1997) proposes that stock returns (R) proxy for economic gains and losses. In the above model, the sensitivity of earnings to economic gains is captured by β_2 and the sensitivity of earnings to economic losses is captured by (β_2 + β_3). If verification standards imposed for recognizing losses are lower than those imposed for recognizing gains, earnings will recognize economic losses in a timelier manner than economic gains. Hence, the association between earnings and stock returns should be incrementally higher when stock returns are negative, i.e., $\beta_3 > 0$ (Basu 1997). We thus use β_3 to measure the extent to which earnings are reported conservatively.

In the robustness tests, we also use Basu (1997)'s earnings time-series model to measure asymmetric timeliness of loss recognition.

4.2 Research design

We use difference-in-difference method to design all empirical tests. Specifically, to examine the influence of CDS trade initiation on accounting conservatism, we expand Basu's (1997) baseline model as specified in Equation (2) by including two indicator variables: the first identifies whether a firm has at least one CDS traded over the sample period and the second captures whether a firm-year observation falls in the two-year period after CDS trade initiation. We estimate the following model using ordinary least square regression with standard errors clustered at the firm level to account for serial correlation within a firm (Petersen 2009).[15]

$$\begin{aligned} EPS_t = {} & \beta_0 + \beta_1 R_t + \beta_2 D_t + \beta_3 D_t \times R_t \\ & + \beta_4 CDS + \beta_5 CDS \times R_t + \beta_6 CDS \times D_t + \beta_7 CDS \times D_t \times R_t \\ & + \beta_8 POST + \beta_9 POST \times R_t + \beta_{10} POST \times D_t + \beta_{11} POST \times D_t \times R_t \\ & + \beta_{12} CDS \times POST + \beta_{13} CDS \times POST \times R_t + \beta_{14} CDS \times POST \times D_t \\ & + \boldsymbol{\beta_{15} CDS \times POST \times D_t \times R_t} + \sum_{j=1}^{N} \lambda_j \text{ADDITIONAL CONTROLS}_j \\ & + \sum_{i=1}^{K} \gamma_i \text{INDUSTRY}_i + \sum_{m=1}^{N} \delta_m \text{YEAR}_m + \varepsilon_t \qquad (3) \end{aligned}$$

where CDS is an indicator variable equal to one for firms with a CDS traded during the sample period, and zero for matched control firms. POST is an indicator variable equal to one (zero) if an observation falls in the two-year period following (preceding) CDS trade initiation for both the CDS firm and its matched control firms. Industry and year fixed effects are included. All the other variables are as defined in Equation (2). To ensure that the results are not entirely driven by matched control firms, we also estimate Equation (3) for CDS firms only (thereby dropping all terms relating to the indicator variable CDS).

Prior studies suggest that firm size, market-to-book ratio, and leverage may affect accounting conservatism (e.g., Basu 1997, Basu et al. 2001a and 2001b, LaFond and Roychowdhury 2008, LaFond and Watts 2008). Therefore, we include these firm characteristics and their interactions with the three terms in Basu's (1997) model in Equation (3) as additional control variables.

Our primary interest is the effect of CDS trade initiation on asymmetric timeliness of loss recognition (H1). Hence, we test whether the coefficient β_{15}, which captures the change in accounting conservatism of CDS firms relative to their matched firms, is significantly different from zero. Since we interact D×R with both POST and CDS, we essentially have a differences-in-differences approach towards testing our hypotheses. In other words, we examine the change

[15] Results are quantitatively similar if we cluster the standard errors at the year and two-digit SIC industry levels.

in conservatism in response to CDS trade initiation, and compare that to changes in conservatism in the same time period for a group of control firms matched on the propensity of CDS trade initiation.

In testing H2a and H2b, we estimate Equation (3) across various subsamples constructed along the dimensions as predicted in the hypothesis. For instance, to examine whether the change in conservatism around CDS trade initiation varies with the riskiness of the underlying borrower, we partition the sample based on whether the borrower's credit rating is above or below investment grade. Subsequently, we test whether the coefficient β_{15} is significantly different from zero for each sub-sample of firms based on the above partition. The partitioning variables are discussed in greater detail in the following section.

5. Empirical results

5.1 Primary hypothesis

Table 5 reports regression results on the change in asymmetric loss recognition timeliness around the onset of CDS trading. The first two columns of Table 5 summarize results of estimating Equation (3). As shown, the coefficient on D×R is significantly positive (coefficient = 1.216, p-value <.001), suggesting that non-CDS firms are more timely in recognizing economic losses than economic gains in the two-year period prior to CDS trading. The coefficient on CDS×D×R, which captures the difference in conservatism between CDS and non-CDS firms prior to the initiation of CDS trading, is positive and statistically significant (coefficient = 0.231, p-value = 0.015). Hence, prior to CDS trading, CDS firms exhibit higher levels of accounting conservatism than their matched non-CDS firms.

Comparing the pre-trading period with the post-trading period, non-CDS firms appear to have no change in the timeliness of recognizing economic losses in the two-year period after CDS trading, as evidenced by the statistically insignificant coefficient on POST×D×R (coefficient = -0.012, p-value = 0.884). Importantly, we find a significantly negative coefficient on CDS×POST×D×R (coefficient = -0.295, p-value = 0.036), suggesting that relative to matched control firms, CDS firms reduce asymmetric timeliness in loss recognition after the onset of CDS trading. The combined coefficient on CDS×POST×R and CDS×POST×D×R (-0.254) is significantly negative, indicating that CDS firms also experience a significant decline in overall (and not just asymmetric) timeliness of loss recognition after CDS trade initiation compared to their match firms. These findings reject the null and support the notion that CDS firms experience a decline in accounting conservatism around the initial years of CDS trading. Economically, the incremental decline in asymmetric timeliness for CDS firms relative to non-CDS firms is about 20 percent of the accounting conservatism level of the CDS firms before the onset of CDS trading (=0.295/(1.216 + 0.231)). This appears to be an economically significant effect, even though in magnitude it is lower than the 46 percent increase in conservatism following a restatement of earnings, implied by the findings in by Ettredge, Huang and Zhang (2012).

Next, we estimate Equation (3) for CDS firms only to ensure that our findings are not driven by the change in accounting conservatism for matched control firms. We therefore exclude all terms related with the indicator variable CDS and control for several firm attributes that may affect accounting conservatism. The last two columns of Panel A report the estimation results. We find that the coefficient on POST×D×R is significantly negative, supporting the notion that CDS firms experience a decline in accounting conservatism after the onset of CDS trading.

Taken together, results presented in Table 5 suggest that regardless of whether CDS firms are benchmarked with matched control firms or are used as their own controls, they become less asymmetric timely in reporting economic losses after the onset of CDS trading. Thus, CDS trade initiation has a net negative effect on accounting conservatism by borrowing firms.

5.2 Cross-sectional hypotheses

5.2.1 The role of reputation costs

To test H2, we examine whether the change in accounting conservatism around CDS trading initiation varies with firm size, and credit rating. We partition our sample of treatment and control firm-years into two groups based on size and credit rating and estimate Equation (3) within each subsample.

Table 6, Panel A presents results for two sub-samples partitioned based on size – specifically, firms below median market value of equity and those above. As shown, the coefficient on CDS×POST×D×R is significantly negative for firms with below median market value (coefficient = -0.518, p-value = 0.005), but insignificant for firms with above median market value (coefficient = 0.132, p-value = 0.544). An F-test of the statistical difference in this coefficient estimate across these two subsamples yields a p-value of 0.037.

Panel B presents results for two sub-samples partitioned based on S&P long-term credit rating – specifically, firms below investment-grade rating and those above. We find that the coefficient on CDS×POST×D×R is significantly negative for firms with below investment grade ratings (coefficient = -0.377, p-value = 0.023). We observe a smaller and insignificant decline in conservatism for firms with credit rating above investment grade (coefficient = -0.089, p-value =

0.603). The difference in the decline in conservatism between the two groups is significant at the 10% level.

In Panel C we construct a common factor, Reputation Factor, based on both firm size and credit rating using the principle-components analysis method. Size is defined as natural logarithm of market value of equity. Credit rating is defined by an ordinal variable ranging between 1 (AAA) and 19 (CCC-) for firms with S&P long term debt rating; we assign a value of 20 for firms in default stage, and 21 for firms with no debt rating. The common factor thus captures the contribution of both size and credit rating to ex ante risk of borrower default, which is expected to be associated negatively with lenders' incentives to maintain post-CDS monitoring out of concern for reputation costs. As constructed, Reputation Factor varies positively with size and negatively with credit rating. We partition the sample based on whether the value of Reputation Factor for a particular firm-year is above or below the median value for that year. The results show that the coefficient on CDS×POST×D×R is significantly negative for firms with low Reputation Factor (coefficient = -0.585, p-value < 0.005), but insignificant for firms with high Reputation Factor (coefficient = 0.177, p-value = 0.478). An F-test of the statistical difference in this coefficient estimate across these two subsamples yields a p-value of 0.014. The decline in conservatism for CDS firms when their lenders are likely to bear lower reputation costs is about 35% of their conservatism level in the pre-CDS period (=(-0.585 + 0.024)/(0.342 + 1.241)).

The results in Panels A, B and C collectively indicate that the post-CDS decline in borrower conservatism is more pronounced when banks entering into CDS contracts face lower reputation costs (as in borrowers with smaller size and poorer credit ratings) from reducing monitoring.

5.2.2 The role of covenants

In examining the role of covenants, we first identify the number of financial covenants in firms' private debt contracts from the LPC (Loan Pricing Corporation)'s Dealscan database. Due to data availability requirements, we are left with a smaller sample size of 3,074 firm-years containing 417 unique CDS firms and 317 unique matched non-CDS firms. For every firm with all loan contracts outstanding in the fiscal year prior to CDS trade initiation and mature after CDS trade initiation, we consider the loan contract with the maximum number of financial covenants because this number likely represents the binding covenant intensity. Subsequently we partition the sample based on whether the number of loan covenants exceeds the sample top quartile (i.e., number of covenants >3) or whether that number is below the bottom quartile (i.e., number of covenants < 2). Table 8 reports results for this partition. Firms exhibit a much more prominent decline in conservatism when the number of financial covenants in existing loan contracts at the time of the CDS trade initiation is above the 75th percentile. From an economic perspective, the accounting conservatism of CDS firms declines about 45% relative to their pre-CDS trade initiation period. When the number of financial covenants in existing loan contracts at the time of the CDS is below the 25th percentile, firms do not exhibit a significant decline in conservatism.

5.3 The issue of bank identity

Although CDS contracts were initially designed to enable lenders such as banks to hedge their credit risk exposures, they are also available for trade to speculators and indeed, also available to banks for speculation (Stulz 2010, Lewis 2010). Nonetheless, there is evidence that banks are increasingly using the CDS market to hedge the credit exposures they originate through their lending business.[16] Firms can observe CDS trade initiation on their own outstanding bonds, but they do not necessarily observe the timing of their lending banks' investments into specific CDS contracts. However, any decline in lenders' scrutiny of financial statements is probably apparent to borrowers, as already discussed in Section 2.3. Since lenders are likely to lower their scrutiny of financial statements only after entering into CDS contracts, we expect any decline in borrower conservatism post CDS-trade-initiation to be more pronounced when banks hedge their credit exposures via the newly-available CDSs.

We first identify banks with outstanding loans to the CDS firms and the matched control firms in our sample. The partial effect for a bank of investing in a CDS contract on a borrower would be to lower the risk weight assigned to the loan on that borrower and to increase the bank's CDS holdings.[17] However, it is difficult to observe the effect of a CDS contract on a single borrower on the bank's risk-weighted assets or on its CDS portfolio. Rather we employ a reverse approach. For each bank, we can observe whether there is a change in the proportion of total assets bearing a risk weight lower than 100% in a given year, and also whether their overall CDS holdings increases/decreases in any given year. We reason that banks for whom the proportion of assets weighted at lower than 100% rises or banks that exhibit an increase in overall CDS holdings *in the same year as* CDS trade initiation on an underlying borrower are more likely to have hedged their exposure to the specific borrower via the newly available CDS contracts.

[16] According to a survey by the British Bankers Association (2006) half of the protection banks bought in the CDS market in 2005 and 2006 were to cover exposures resulting from their lending activities.

[17] Loans to corporate entities are assigned a risk weight between 20% and 150% under the standardized approach to credit risk. The risk weight declines if the bank is hedged on its exposure to a specific borrower via CDS contracts if the credit rating of the CDS sellers is higher than that of the borrower.

In Table 8 Panel A we present results for two sub-samples partitioned based on whether there was an increase in the proportion of banks' assets risk-weighted at lower than 100% in the same year as CDS trade initiation. We identify banks lending to CDS and non-CDS firms in our sample using data obtained from the LPC (Loan Pricing Corporation) Dealscan database, and the risk weights on banks' assets from Federal Reserve's Y-9C reports. We find that the coefficient on CDS×POST×D×R is significantly negative for firms whose banks exhibit an increase in the proportion of assets that bear risk weights lower than 100% (coefficient = -0.452, p-value = 0.003), but is actually positive and statistically significant for firms whose banks do not exhibit an increase in the proportion of assets that bear risk weights lower than 100% (coefficient = 0.286, p-value = 0.028). An F-test of the statistical difference in this coefficient estimate across these two subsamples yields a p-value of 0.003.

Table 8, Panel B presents results for two sub-samples partitioned on whether banks exhibit an increase in CDS portfolio holdings in the same year as CDS trade initiation on underlying borrowers. CDS portfolio holdings of banks are obtained from Federal Reserve's Y-9C reports. As shown, the coefficient on CDS×POST×D×R is significantly negative for firms whose banks exhibit an increase in CDS holdings in the year of CDS trade initiation (coefficient = -1.020, p-value = 0.000), but insignificant for firms whose banks do not exhibit an increase in CDS holdings (coefficient = -0.113, p-value = 0.310). An F-test of the statistical difference in this coefficient estimate across these two subsamples yields a p-value of 0.100.

Finally, Panel C presents results based on identifying firms whose banks exhibit either an increase in the proportion of assets bearing risk weights below 100% or an increase in CDS holdings. We find that the coefficient on CDS×POST×D×R is significantly negative when either condition is satisfied (coefficient = -0.522, p-value = 0.000). Economically, the decline in conservatism for CDS firms when their lenders are likely to enter into CDS contracts for hedging is about 27% of their conservatism level in the pre-CDS period (=(-0.522 + 0.022)/(0.245 + 1.584)). In contrast, the conservatism level for CDS firms relative to their counterparts when lenders unlikely enter into CDS contracts actually increases significantly in the post-CDS period relative to matched control firms (coefficient = 0.437, p-value = 0.003). This may be evidence of a selection bias: banks that do not hedge their exposures to underlying borrowers even when CDS contracts are available are likely to be the ones that do not intend to lower their demand for conservatism and/or their monitoring of financial statements. An F-test of the statistical difference in this coefficient estimate across the two subsamples yields a p-value below 0.000 (rounded).

We repeat all our cross-sectional analyses in Section 5.2 within the sample of firms that are likely to have hedged their credit exposures via CDSs (that is, firms whose banks exhibit either an increase in the proportion of assets bearing risk weights below 100% or an increase in CDS holdings). The results on cross-sectional variation obtained in Tables 6 and 7 are robust to using this sub-sample; that is, we find a more pronounced decline in conservatism (a) when borrowers are risky and informationally opaque ex ante, and (b) when borrowers' debt contracts outstanding at the time of CDS trade initiation include a larger number of financial covenants.

In untabulated analysis, we also modified the first stage prediction model following Minton, Stulz & Williamson (2009), to incorporate bank propensity to invest in derivative securities, including interest rate, foreign exchange, equity and commodity derivatives. The findings we obtain in Tables 5, 6 and 7 with respect to both our primary and cross-sectional hypotheses are robust to using this first stage model.

5.4 Additional analysis:

5.4.1 Endogeneity between expected change in conservatism and CDS trade initiation

In our final analysis, we examine the possibility that CDS trade initiation is more likely when lenders anticipate a decline in borrower conservatism. While existing literature does not raise this possibility, it has a testable empirical prediction: a negative association between *expected* change in conservatism and CDS trade initiation. Note that in our primary tests, we are interested in whether there is an actual *ex post* decline in conservatism after CDS trade initiation as lenders lower monitoring of financial statements. Key to distinguishing between the two possibilities is the measurement of, and the imposition of a control for, expected change in conservatism. Accordingly, we modify our empirical research design to match control firms to treatment firms based on expected change in conservatism.

To accommodate the cross-sectional nature of our conservatism measure, we develop a novel approach for measuring expected change in conservatism. Khan and Watts (2009) demonstrate that the asymmetric timeliness of earnings (i.e., the Basu measure) varies monotonically across deciles of CSCORE, a firm-specific measure of conservatism. We partition firms in the Compustat universe into quintiles of CSCORE in the year prior to CDS trade initiation, that is, year *t-1* (where year *t* is the year of CDS trade initiation). We then estimate the cross-sectional Basu measure within each of these quintiles and assign the corresponding asymmetric timeliness coefficient to all firms in that quintile. Holding quintile membership constant, we measure the cross-sectional Basu measure for year *t+1*, that is, the year after CDS trade initiation. The actual change in the asymmetric timeliness coefficient for the CSCORE quintile from year *t-1* to *t+1* serves as a proxy for the expected change in conservatism for every firm within that quintile. Thereafter, we augment our first stage model with expected change in conservatism.

The association between CDS trade initiation and expected change in conservatism is significantly negative. Note that our measure of expected conservatism suffers from hindsight bias, since it relies on actual change in conservatism measured ex post. Therefore, some caution is warranted in interpreting the negative association observed in the first stage as a causal relation between expected change in conservatism and CDS trade initiation. However, we still retain this measure since the effect, if any, would be to reduce the power of our second-stage regression to detect an actual change in conservatism for CDS firms. Upon matching on the propensity score from the modified first stage model, we detect no difference in *expected* change in conservatism between matched and control firms. In the second stage, we still observe an actual decline in conservatism among CDS firms upon CDS trade initiation, with this decline being much more pronounced relative to propensity-score-matched non-CDS firms, as shown in Table 9.[18]

In untabulated tests, we confirm that the results we obtain with the modified first stage persist after isolating instances where banks are more likely to have entered into CDS contracts. The decline in conservatism is stronger for banks that exhibit an increase in either their CDS portfolio holdings or the proportion of assets bearing lower-risk-weights, even after controlling for expected changes in conservatism.

5.4.2 Robustness to using non-returns based measure of conservatism

[18] The sample size reduces slightly due to the enhanced data requirements for estimating our first stage propensity score model, which adversely influences the extent to which we can find matches for CDS firms.

CDS trade initiation potentially influences equity price changes (see for example Boehmer, Chava and Tookes 2012), and in turn can conceivably influence the returns-based Basu measure of conservatism. Note that the magnitude and even direction of this influence is far from obvious, and it is unlikely that any influence of CDS trade initiation on stock prices can generate the collective evidence we report. Nevertheless, to check robustness to a non-returns-based measure of conservatism, we utilize an alternative measure of asymmetric loss recognition based on an earnings time-series model (Basu 1997, Ball and Shivakumar 2005). Specifically, we estimate the following equation using ordinary least square regression with standard errors clustered at the firm level based on the sample consisting of both CDS firms and matched control firms.

$$
\begin{aligned}
\Delta E_t = {} & \gamma_0 + \gamma_1\,\Delta E_{t-1} + \gamma_2\,D_{t-1} + \gamma_3\,D_{t-1} \times \Delta E_{t-1} \\
& + \gamma_4\,CDS + \gamma_5\,CDS \times \Delta E_{t-1} + \gamma_6\,CDS \times D_{t-1} + \gamma_7\,CDS \times D_{t-1} \times \Delta E_{t-1} \\
& + \gamma_8\,POST + \gamma_9\,POST \times \Delta E_{t-1} + \gamma_{10}\,POST \times D_{t-1} + \gamma_{11}\,POST \times D_{t-1} \times \Delta E_{t-1} \\
& + \gamma_{12}\,CDS \times POST + \gamma_{13}\,POST \times CDS \times \Delta E_{t-1} + \gamma_{14}\,CDS \times POST \times D_{t-1} \\
& + \boldsymbol{\gamma_{15}\,CDS \times POST \times D_{t-1} \times \Delta E_{t-1}} + \sum_{j=1}^{N} \lambda_j \mathrm{ADDITIONAL\ CONTROLS}_j \\
& + \sum_{i=1}^{K} \gamma_i \mathrm{INDUSTRY}_i + \sum_{m=1}^{N} \delta_m \mathrm{YEAR}_m + \varepsilon_t \qquad (4)
\end{aligned}
$$

where ΔE_t is current year's earnings change, ΔE_{t-1} is previous year's earnings change, D is an indicator variable equal to one for previous earnings decline (i.e., $\Delta E_{t-1} < 0$) and zero otherwise, and the other variables are as defined in Equation (3). In the above equation, we allow earnings persistence to differ between earnings increase and earnings declines. More timely recognition of losses than gains implies that earnings increases are more persistent than earnings declines. Hence, a reduction of accounting conservatism around the CDS-trade-initiation year would require that the coefficient on $CDS \times POST \times D_{t-1} \times \Delta E_{t-1}$, γ_{15}, be significantly positive.

Results presented in Table 10 corroborate those presented in Table 5. The coefficient on $CDS \times POST \times D_{t-1} \times \Delta E_{t-1}$ is significantly positive at the 5% level (coefficient = 1.308, p-value = 0.017), implying that reversals in earnings declines are less in the years following CDS trade initiation. Our finding reinforces the conclusion that CDS firms experience a decline in the asymmetric timeliness of loss recognition after the onset of CDS trading.[19]

In untabulated tests, we confirm that the results we obtain with earnings time-series measure persist after isolating instances where banks are more likely to have entered into CDS contracts. The decline in conservatism is stronger for banks that exhibit an increase in either their CDS portfolio holdings or the proportion of assets bearing lower-risk-weights.

6. Conclusion

The primary purpose of our paper is to investigate the influence of financial market developments on financial reporting practices. Our results indicate that the onset of CDS trading is associated with a decline in the reporting conservatism of underlying borrowers, particularly when banks are likely to have entered into CDS contracts on these borrowers for the purpose of hedging their exposures. The post-CDS decline in conservatism is more pronounced when lenders face lower reputation costs from lowering monitoring of financial statements, that is, among borrowers that are inherently riskier with poorer information environments. Borrowers also exhibit a greater decline in conservatism when outstanding debt at the time of CDS trade initiation includes a larger number of financial covenants.

A key insight in our paper is that accounting conservatism is not only tied to the presence of leverage or that of private debt contracts, but also driven by lenders' incentives to monitor

[19] There is a reduction in sample size, because we impose the requirement that for every year, enough data be available to compute earnings changes for the consecutive year.

financial statements. Our evidence suggests that the ability to hedge credit risk exposures on their loans via CDSs weakens lenders' incentives to monitor whether borrowers maintain their financial reporting conservatism. This is particularly true when implicit mechanisms that encourage lenders to ensure that conservative reporting practices are maintained, such as reputation costs, are weaker (as in the case when borrowers have higher credit risk profiles). Under the current structure of the CDS market, any reduction in lenders' monitoring intensity is not offset by increased scrutiny of financial statements by CDS sellers, who typically refrain from direct involvement with underlying borrowers. Borrowers respond by reporting less conservatively, even though the structure of their own schedule of payments to lenders is unaltered.

A caveat applies to the interpretation of our results. Our study is limited to the examination of any change in conservatism in the relatively short horizon of four years surrounding the onset of CDS trading. We interpret this finding as borrowers' responding to a decline in lender monitoring of financial statements. However, we are not in a position to comment on whether borrowers take actions that transfer wealth from debt-holders to shareholders beyond financial reporting, for example via asset substitution, underinvestment, overpayment of dividends, etc. To the extent that such actions are facilitated by less conservative reporting, the CDS market may potentially be detrimental to a firm's long-term ability to access debt. In that sense, the structure of the CDS market during the sample period examined in this study may be off-equilibrium. The current debate about moving CDS to organized exchanges and requiring increased transparency for CDS positions (Stulz 2010, Duffie and Zhu 2011) reflects one aspect of the on-going discussions regarding the development of the CDS market. Alternatively, it is possible that governance mechanisms that do not necessarily rely on conservative reporting step in to offset the adverse effects of any reduction in lender monitoring of financial statements. For example, Bolton and Oehmke (2010) discuss how borrowers, anticipating that lenders insured via CDS hedge contracts will be particularly intransigent upon a negative credit event, may modify behavior of their own accord to avoid such events. The emergence of the CDS market can thus provide an alternative channel via which the presence of lenders influences borrower behavior, rather than the traditional one based on lender monitoring.

A thorough investigation into these possible scenarios following the onset of CDS trading and the accompanying decline in conservatism is beyond the scope of this study, but can serve as a fertile area for future research.

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Appendix

Sample Term Sheet for a Credit Default Swap Traded by XYZ Bank PLC

This appendix provides an example of credit default swap contract.[20]

Draft Terms – Credit Default Swap

1. General Terms

Trade Date	Aug 5, 2003
Effective Date	Aug 6, 2003
Scheduled Termination Date	Jul 30, 2005
Floating Rate Payer ('Seller')	XYZ Bank plc, London branch
Fixed Rate Payer ('Buyer')	ABC Investment Bank plc
Calculation Agent	Seller
Calculation Agent City	New York
Business Day	New York
Business Day Convention	Following
Reference Entity	Jackfruit Records Corporation
Reference Obligation	Primary Obligor: Jackfruit Records
Maturity	Jun 30, 2020
Coupon	0%
CUSIP/ISIN	xxxxx
Original Issue Amount	USD 100,000,000
Reference Price	100%
All Guarantees	Not Applicable

2. Fixed Payments

Fixed Rate Payer Calculation Amount	USD 7,000,000
Fixed Rate	0.3% per annum
Fixed Rate Payer Payment Date(s)	Oct 30, Jan 30, Apr 30, Jul 30, starting Oct 30, 2003
Fixed Rate Day Count Fraction	Actual/360

3. Floating Payments

Floating Rate Payer Calculation Amount	USD 7,000,000
Conditions to Payment	Credit Event Notice (Notifying Parties: Buyer orSeller)
	Notice of Publicly Available Information: Applicable(Public Source: Standard Public Sources. Specified Number: Two)

[20] http://people.stern.nyu.edu/igiddy/cases/CDS_SampleTermSheet.pdf.

Credit Events	Bankruptcy
Failure to Pay (Grace Period Extension: Not Applicable. Payment Requirement: $1,000,000)	
Obligation(s)	Borrowed Money

4. Settlement Terms

Settlement Method	Physical Settlement
Settlement Currency	The currency in which the Floating Rate Payer Calculation Amount is denominated
Terms Relating to Physical Settlement	
Physical Settlement Period	The longest of the number of business days for settlement in accordance with the then- current market practice of any Deliverable Obligation being Delivered in the Portfolio, as determined by the Calculation Agent, after consultation with the parties, but in no event shall be more than 30 days
Portfolio	Exclude Accrued Interest
Deliverable Obligations	Bond or Loan
Deliverable Obligation Characteristics	Not Subordinated Specified Currency – Standard Specified Currencies Maximum Maturity: 30 years Not Contingent Not Bearer Transferable Assignable Loan Consent Required Loan
Restructuring Maturity Limitation	Not Applicable
Partial Cash Settlement of Loans	Not Applicable
Partial Cash Settlement of Assignable Loans	Not Applicable
Escrow	Applicable

5. Documentation

Confirmation to be prepared by the Seller and agreed to by the Buyer. The definitions and provisions contained in the 2003 ISDA Credit Derivatives Definitions, as published by the International Swaps and Derivatives Association, Inc., as supplemented by the May 2003 Supplement, to the 2003 ISDA Credit Derivatives Definitions (together, the ‘Credit Derivatives Definitions’), are incorporated into the Confirmation

6. Notice and Account Details

Telephone, Telex and/or Facsimile Numbers and Contact Details for Notices	Buyer: Phone: Fax: Seller: A.N. Other Phone: +1 212-xxx-xxxx Fax: +1 212-xxx-xxxx
Account Details of Seller	84-7512562-85

Risks and Characteristics

Credit Risk. An investor's ability to collect any premium will depend on the ability of XYZ Bank plc to pay.

Non-Marketability. Swaps are not registered instruments and they do not trade on any exchange. It may be impossible for the transactor in a swap to transfer the obligations under the swap to another holder. Swaps are customised instruments and there is no central source to obtain prices from other dealers.

Table 1
Logistic Regression Results on Probability of Initiating CDS Trading

	Dependent Variable = Prob(CDS=1)	
Variable	Coeff Est.	p-value
Intercept	-6.485	<0.001
INVESTMENT GRADE	0.691	<0.001
RATING	1.356	<0.003
LEV	1.476	<0.001
PROFIT MARGIN	0.106	<0.001
SIZE	0.439	<0.001
RETURN VOLATILITY	-2.201	<0.001
MB	0.023	0.331
Pseudo R^2	0.46	
Model significance	1,940.55	<0.001
Likelihood ratio	21,145.97	<0.001
Percent concordant	91.50%	
Percent discordant	8.11%	
Number of firm-years	138735	

This table reports coefficient estimates from estimating a logistic model to predict the onset of credit default swap (CDS) trading. The dependent variable, CDS, is equal to 1 if a CDS is traded on a firm, and 0 otherwise. Independent variables include INVEST GRADE, an indicator variable equal to 1 if a firm has a S&P credit rating above BB+, and 0 otherwise; RATING, an indicator variable equal to 1 if a firm has a S&P credit rating, and 0 otherwise; SIZE, natural logarithm of market value; MB, the ratio of market value of equity to book value of equity; LEV, leverage equal to total debt scaled by total assets; PROFIT MARGIN is net income scaled by sales; RETURN VOLATILITY is standard deviation of monthly stock return within a fiscal year. The sample period spans 1997 to 2010, containing firms without CDS traded and firms with CDS traded during this period. For firms with CDS traded, only firm-years prior to the onset of CDS trading are included in the sample. Robust standard errors are estimated and are clustered at the firm level.

Table 2
Sample Distribution

Panel A: Sample distribution by CDS onset year for both CDS and non-CDS firms

	CDS		Non-CDS	
Year	N	%	N	%
2002	1	0.19	2	0.38
2003	128	24.2	237	45.14
2004	297	56.14	184	35.05
2005	41	7.75	32	6.1
2006	13	2.46	17	3.24
2007	41	7.75	43	8.19
2008	3	0.57	5	0.95
2009	5	0.95	5	0.95
Total	529	100	525	100

Panel B: Sample distribution by industry

	CDS		Non-CDS	
Industry (based on 1-digit SIC)	N	%	N	%
Mining, mineral and construction	57	10.78	40	7.62
Food, apparel, petroleum refining, and paper and printing	122	23.06	113	21.52
Rubber, stone, computer, transportation equipment	125	23.63	130	24.76
Railroad transportation and Electric and Gas	107	20.23	121	23.05
Retail and wholesale	55	10.40	51	9.72
Business service	47	8.88	55	10.47
Public service	13	2.46	12	2.28
Government service	3	0.57	3	0.58
Total	529	100	525	100

This table reports sample distribution by the CDS onset year in Panel A and by industry in Panel B, for both CDS firms and their matched firms (Non-CDS). For the match firms, the CDS onset year is assumed from their matched CDS firms.

Table 3
Summary Statistics

Panel A: Pre-CDS trading period

	CDS		Non-CDS		Mean Diff
Variable	Mean	Median	Mean	Median	
EPS	0.033	0.055	0.023	0.050	0.010*
R	0.178	0.153	0.186	0.153	-0.008
D	0.273	0.000	0.293	0.000	-0.021
SIZE	8.849	8.770	8.123	7.969	0.726***
MB	1.142	0.884	1.240	0.920	-0.099**
LEV	0.297	0.268	0.291	0.270	0.005

Panel B: Post-CDS trading period

	CDS		Non-CDS		Mean Diff
Variable	Mean	Median	Mean	Median	
EPS	-0.007	0.042	-0.010	0.038	0.003
R	0.093	0.057	0.094	0.059	-0.001
D	0.429	0.000	0.432	0.000	-0.003
SIZE	8.424	8.307	7.627	7.480	0.798***
MB	1.112	0.786	1.333	0.817	-0.221***
LEV	0.328	0.309	0.325	0.308	0.003

This table reports sample mean and median for main variables in the empirical analysis for both CDS firms and their matching firms (Non-CDS) for both pre-CDS onset period and post-CDS onset period. The pre-CDS onset period covers two years prior to the onset of CDS and the post-CDS onset period covers two years after the onset of CDS. For Non-CDS firms, the onset year is assumed from their matching firms. The sample period spans 2001 to 2010. EPS is net income scaled by prior year market value of equity; R is 12 month compounded returns starting 9 months before the fiscal year end. D is an indicator variable coded 1 if R is less than 0, and 0 otherwise. SIZE, natural logarithm of market value; MB, the ratio of market value of equity to book value of equity; LEV, leverage equal to total debt scaled by total assets.

Table 4
Pearson and Spearman Correlations between Selected Variables

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	EPS	1.00	**0.21**	**-0.19**	**0.32**	**0.13**	**-0.22**	0.01	**0.12**
(2)	R	**0.09**	1.00	**-0.73**	**0.08**	**0.08**	-0.03	-0.01	**0.11**
(3)	D	**-0.10**	**-0.83**	1.00	**-0.13**	**-0.07**	**0.06**	0.00	**-0.15**
(4)	SIZE	**0.16**	**0.09**	**-0.13**	1.00	**0.28**	**-0.33**	**0.23**	**0.13**
(5)	MB	0.01	**0.14**	**-0.15**	**0.38**	1.00	**-0.23**	**-0.06**	-0.01
(6)	LEV	**-0.07**	-0.04	**0.05**	**-0.31**	**-0.43**	1.00	0.02	**-0.08**
(7)	CDS	**0.04**	0.00	0.00	**0.24**	-0.04	0.03	1.00	**-0.05**
(8)	POST	**0.16**	**0.13**	**-0.15**	**0.14**	**0.08**	**-0.09**	**-0.05**	1.00

This table reports Pearson (above diagonal) and Spearman (below diagonal) corrections among variables used in the empirical analysis. The sample period spans 2001 to 2010. EPS is net income scaled by prior year market value of equity; R is 12 month compounded returns starting 9 months before the fiscal year end. D is an indicator variable coded 1 if R is less than 0, and 0 otherwise. SIZE is natural logarithm of market value of a firm; MB is market value of equity to book value of equity of a firm; LEV is leverage equal to total debt scaled by total assets; CDS is an indicator variable equal to 1 if a firm has a CDS traded over the sample period. POST is an indicator variable equal to 1 if a year falls in the two years after the onset of CDS trading, and 0 if a year falls in the two years before the onset of CDS trading for CDS firms. The match firms take on the same value of POST as the matched CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Bold figures indicate significant level less than 1%.

Table 5
OLS Regression Results on the Relation between Asymmetric Loss Recognition Timeliness and the Onset of CDS Trading

Basu's (1997) measure

	Dependent variable = EPS_t			
	CDS firms and Matched firms		CDS firms only	
Variable	Coeff. Est.	p-value	Coeff. Est.	p-value
R_t (β_1)	-0.076	0.295	-0.037	0.847
D_t (β_2)	0.148	0.014	0.327	0.002
$D_t \times R_t$ (β_3)	1.216	0.000	1.589	0.000
CDS (β_4)	-0.017	0.193		
CDS × R_t (β_5)	-0.033	0.308		
CDS × D_t (β_6)	0.048	0.024		
CDS × $D_t \times R_t$ (β_7)	0.231	0.015		
POST (β_8)	-0.023	0.023	0.009	0.572
POST × R_t (β_9)	0.024	0.260	0.045	0.052
POST × D_t (β_{10})	0.038	0.045	-0.029	0.144
POST × $D_t \times R_t$ (β_{11})	**-0.012**	**0.884**	**-0.293**	**0.012**
CDS × POST (β_{12})	0.005	0.708		
CDS × POST × R_t (β_{13})	0.041	0.208		
CDS * POST × D_t (β_{14})	-0.073	0.010		
CDS × POST × $D_t \times R_t$ (β_{15})	**-0.295**	**0.036**		
Additional controls	Included		Included	
Intercept (β_0)	0.087	0.000	-0.047	0.625
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.254	0.059		
F-test: ($\beta_9 + \beta_{11}$)			-0.248	0.001
Number of firm-years	4,428		1,996	
Adjusted R^2 (%)	34.51		17.17	

This table reports multivariate regression results on the relation between Basu's (1997) measure of asymmetric loss recognition timeliness and the onset of CDS trading. The sample period spans 2001 to 2010. Firms in financial industries are excluded. The dependent variable is EPS, defined as net income scaled by prior year's market value of equity. R is twelve-month buy-and-hold returns starting nine months before the fiscal year end. D is an indicator variable equal to one if R is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. The matched control sample is chosen based on propensity score matching method, where propensity score model is described in Table 1. POST is an indicator variable equal to one if a year falls in the two-year period after the CDS-trade-initiation year, and zero if a year falls in the two-year period prior to the CDS-trade-initiation year for CDS firms. The match control firms take on the same value of POST as the matched CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with R, D, and D × R. Year and industry fixed effects are included. P-values are derived based on robust standard errors clustered at the firm level.

Table 6
Cross-sectional Analysis of the Relation between Asymmetric Loss Recognition Timeliness and the Onset of CDS Trading Conditional on Firm Size and Credit Rating

Panel A: Conditional on firm size

	Dependent variable = EPS_t			
	Below median MVE		Above median MVE	
Variable	Coeff. Est.	p-value	Coeff. Est.	p-value
R_t (β_1)	-0.011	0.941	-0.050	0.329
D_t (β_2)	0.121	0.456	0.068	0.235
$D_t \times R_t$ (β_3)	1.005	0.002	0.780	0.041
CDS (β_4)	-0.051	0.039	0.006	0.407
CDS × R_t (β_5)	-0.027	0.606	-0.036	0.037
CDS × D_t (β_6)	0.085	0.018	0.007	0.710
CDS × $D_t \times R_t$ (β7)	0.289	0.026	0.098	0.351
POST (β_8)	-0.038	0.018	-0.001	0.865
POST × R_t (β_9)	0.052	0.106	-0.005	0.783
POST × D_t (β_{10})	0.058	0.032	-0.005	0.801
POST × $D_t \times R_t$ (β_{11})	**-0.025**	**0.813**	**-0.117**	**0.271**
CDS × POST (β_{12})	0.022	0.391	-0.010	0.301
CDS × POST × R_t (β_{13})	0.051	0.352	0.026	0.232
CDS * POST × D_t (β_{14})	-0.147	0.002	0.010	0.725
CDS × POST × $D_t \times R_t$ (β_{15})	**-0.518**	**0.005**	**0.132**	**0.544**
Additional controls	Included		Included	
Intercept (β_0)	-0.279	0.005	0.048	0.079
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.467	0.0593	0.158	0.462
F-test: β_{15} across subsamples (p-value)	-0.65 (0.037)			
Number of firm-years	2,214		2,214	
Adjusted R^2 (%)	34.49		15.04	

TABLE 6 (Continued)

Panel B: Conditional on credit rating

	Dependent variable = EPS_t			
	Below investment grade		Above investment grade	
Variable	Coeff. Est.	p-value	Coeff. Est.	p-value
R_t (β_1)	-0.025	0.783	-0.007	0.863
D_t (β_2)	0.167	0.078	0.005	0.878
$D_t \times R_t$ (β_3)	1.131	0.000	0.064	0.750
CDS (β_4)	-0.030	0.133	-0.004	0.537
CDS × R_t (β_5)	-0.030	0.457	-0.014	0.474
CDS × D_t (β_6)	0.072	0.025	-0.010	0.511
CDS × $D_t \times R_t$ (β7)	0.276	0.016	0.026	0.765
POST (β_8)	-0.034	0.009	0.004	0.664
POST × R_t (β_9)	0.033	0.194	0.003	0.852
POST × D_t (β_{10})	0.058	0.019	-0.006	0.743
POST × $D_t \times R_t$ (β_{11})	**0.029**	**0.754**	**-0.094**	**0.532**
CDS × POST (β_{12})	0.008	0.682	0.004	0.542
CDS × POST × R_t (β_{13})	0.047	0.252	0.004	0.838
CDS * POST × D_t (β_{14})	-0.108	0.006	-0.004	0.862
CDS × POST × $D_t \times R_t$ (β_{15})	**-0.377**	**0.023**	**-0.089**	**0.603**
Additional controls	Included		Included	
Intercept (β_0)	-0.109	0.050	0.057	0.027
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.330	0.0593	-0.085	0.462
F-test: β_{15} across subsamples (p-value)	-0.288 (0.075)			
Number of firm-years	3,000		1,428	
Adjusted R^2 (%)	30.55		11.93	

Table 6 (Continued)

Panel C: Conditional on lender reputation factor

	Dependent variable = EPS_t			
	Below median reputation factor		Above median reputation factor	
Variable	Coeff. Est.	p-value	Coeff. Est.	p-value
R(β1)	-0.028	0.776	0.046	0.552
D(β2)	0.161	0.062	0.089	0.032
D * R(β3)	1.241	0.000	0.553	0.000
CDS(β4)	-0.036	0.104	0.002	0.856
CDS * R(β5)	-0.042	0.312	-0.001	0.973
CDS * D(β6)	0.071	0.035	-0.002	0.868
CDS * D * R(β7)	0.342	0.000	0.030	0.484
POST(β8)	-0.034	0.126	0.020	0.064
POST * R(β9)	0.067	0.053	0.000	0.993
POST * D(β10)	0.069	0.022	-0.014	0.371
POST * D * R(β11)	0.024	0.768	-0.094	0.209
CDS * POST(β12)	0.015	0.626	-0.012	0.271
CDS * POST * R(β13)	0.038	0.512	0.010	0.729
CDS * POST * D(β14)	-0.146	0.003	0.034	0.080
CDS * POST * D * R(β15)	**-0.585**	**0.005**	**0.177**	**0.478**
Additional Controls	Included		Included	
Intercept (β_0)	-0.276	0.001	-0.068	0.107
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.547	0.005	0.187	0.463
F-test: β_{15} across subsamples (p-value)		-0.762 (0.014)		
Number of firm-years	2214		2214	
Adjusted R^2 (%)	33.2		19.9	

TABLE 6 (Continued)

This table reports cross-sectional analysis of firm size, credit rating, and the common factor constructed based on the former two variables on the relation between asymmetric timely loss recognition and the onset of CDS trading. The sample period spans 2001 to 2010. Firms in financial industries are excluded. The dependent variable is EPS, defined as net income scaled by prior year's market value of equity. In Panel A, the sample is partitioned into large firms and small firms based on the full sample median market value of equity prior to the year of CDS onset. In Panel B, the sample is partitioned into firms with investment-grade credit rating and firms without investment-grade credit rating prior to the year of CDS onset. In Panel C, the sample is partitioned into high lender reputation and low lender reputation based on the full sample median lender reputation factor. Lender reputation factor is derived from the principal component analysis based on the two variables: natural logarithm of firm market value of equity and long-term S&P credit rating. Credit rating is defined by an ordinal variable ranging between 1 (AAA) and 19 (CCC-) for firms with S&P long term debt rating; we assign a value of 20 for firms in default stage, and 21 for firms with no debt rating. R is twelve-month buy-and-hold returns starting nine months before the fiscal year end. D is an indicator variable equal to one if R is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. The matched control sample is chosen based on propensity score matching method, where propensity score model is described in Table 1. POST is an indicator variable equal to one if a year falls in the two-year period after the CDS-trade-initiation year, and zero if a year falls in the two-year period prior to the CDS-trade-initiation year for CDS firms. The match control firms take on the same value of POST as the matched CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with R, D, and D × R. Year and industry fixed effects are included. P-values are derived based on robust standard errors clustered at the firm level.

Table 7
Cross-sectional Analysis of the Relation between Asymmetric Loss Recognition Timeliness and the Onset of CDS Trading Conditional on Loan Contracts with Financial Covenants

	Dependent variable = EPS_t			
	Number of Financial Covenants>3		Number of Financial Covenants<2	
Variable	Coeff. Est.	p-value	Coeff. Est.	p-value
R(β1)	-0.043	0.727	-0.173	0.415
D(β2)	0.117	0.277	0.080	0.597
D * R(β3)	1.002	0.001	0.838	0.027
CDS(β4)	-0.010	0.670	-0.013	0.349
CDS * R(β5)	-0.081	0.034	0.066	0.301
CDS * D(β6)	0.024	0.605	-0.004	0.913
CDS * D * R(β7)	0.231	0.243	-0.191	0.449
POST(β8)	-0.008	0.678	-0.030	0.228
POST * R(β9)	0.029	0.472	0.086	0.182
POST * D(β10)	0.028	0.387	-0.038	0.434
POST * D * R(β11)	-0.053	0.738	-0.496	0.005
CDS * POST(β12)	-0.024	0.103	0.033	0.164
CDS * POST * R(β13)	0.123	0.031	-0.064	0.402
CDS * POST * D(β14)	-0.029	0.534	-0.038	0.468
CDS * POST * D * R(β15)	**-0.497**	**0.006**	**0.246**	**0.397**
Additional Controls	Included		Included	
Intercept (β_0)	-0.037	0.580	-0.065	0.251
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.374	0.024	0.182	0.274
F-test: β_{15} across subsamples (p-value)	-0.556 (0.067)			
Number of firm-years	1153		711	
Adjusted R^2 (%)	37.01		33.04	

This table reports cross-sectional analysis based on financial covenants in loan contracts to the firms in our sample. The sample period spans 2001 to 2010. Banks lending to CDS and non-CDS firms in the sample are identified using data obtained from the LPC (Loan Pricing Corporation)'s Dealscan database. Loan contracts that are outstanding prior to the CDS trade initiation date but mature after that date are identified from the LPC database. Among all loans outstanding, the number of financial covenants is measured for the loan with the maximum number of financial covenants in the year prior to the onset of CDS trading. The sample is partitioned into more (few) covenants groups in which firms have loans contracts outstanding with the number of financial covenants exceeding 3 (below 2). The dependent variable is EPS, defined as net income scaled by prior year's market value of equity. R is twelve-month buy-and-hold returns starting nine months before the fiscal year end. D is an indicator variable equal to one if R is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. POST is an indicator variable equal to one if a year falls in the two-year period after the CDS-trade-initiation year, and zero if a year falls in the two-year period prior to the CDS-trade-initiation year for CDS firms. The match control firms take on the same value of POST as the matched CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with R, D, and D × R. Year and industry fixed effects are included. P-values are derived based on robust standard errors clustered at the firm level.

Table 8
Cross-sectional Analysis of the Relation between Asymmetric loss recognition timeliness and the Onset of CDS Trading Conditional on bank characteristics

Panel A: The proportion of banks' assets bearing lower risk weights

	Dependent variable = EPS_t			
	Increase in proportion of assets with lower risk-weight		No increase in proportion of assets with lower risk-weight	
Variable	Coef.	P>t	Coef.	P>t
R(β1)	-0.190	0.121	0.015	0.880
D(β2)	0.279	0.004	0.167	0.018
D * R(β3)	1.734	0.000	1.010	0.000
CDS(β4)	0.004	0.855	-0.047	0.010
CDS * R(β5)	-0.091	0.054	0.086	0.035
CDS * D(β6)	-0.003	0.928	0.042	0.138
CDS * D * R(β7)	0.173	0.121	-0.147	0.069
POST(β8)	0.003	0.914	-0.005	0.802
POST * R(β9)	0.011	0.804	0.045	0.254
POST * D(β10)	0.001	0.980	-0.021	0.514
POST * D * R(β11)	-0.101	0.378	-0.345	0.000
CDS * POST(β12)	-0.027	0.368	0.032	0.179
CDS * POST * R(β13)	0.099	0.129	-0.041	0.453
CDS * POST * D(β14)	-0.042	0.422	0.000	0.998
CDS * POST * D * R(β15)	**-0.452**	**0.003**	**0.286**	**0.028**
Additional Controls	Included		Included	
Intercept (β_0)	0.016	0.825	-0.069	0.192
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.353	0.010	0.245	0.038
F-test: β_{15} across subsamples (p-value)		-0.598 (0.003)		
Number of firm-years	1,135		1,651	
Adjusted R^2 (%)	33.13		35.01	

Table 8 (Continued)

Panel B: Bank CDS holding change

	Dependent variable = EPS_t			
	Increase in CDS holdings		No increase in CDS holdings	
Variable	Coef.	P>t	Coef.	P>t
R(β1)	-0.361	0.014	0.001	0.991
D(β2)	0.115	0.357	0.226	0.000
D * R(β3)	1.633	0.000	1.151	0.000
CDS(β4)	0.023	0.461	-0.025	0.131
CDS * R(β5)	-0.248	0.001	0.036	0.312
CDS * D(β6)	0.074	0.148	0.017	0.524
CDS * D * R(β7)	0.742	0.000	-0.067	0.350
POST(β8)	0.003	0.903	-0.002	0.931
POST * R(β9)	-0.046	0.370	0.064	0.075
POST * D(β10)	0.027	0.522	-0.002	0.946
POST * D * R(β11)	0.076	0.554	-0.173	0.045
CDS * POST(β12)	-0.099	0.052	0.013	0.541
CDS * POST * R(β13)	0.354	0.001	-0.019	0.685
CDS * POST * D(β14)	-0.118	0.158	-0.028	0.453
CDS * POST * D * R(β15)	**-1.020**	**0.000**	**-0.113**	**0.310**
Additional Controls	Included		Included	
Intercept (β_0)	0.142	0.160	-0.189	0.002
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.665	0.002	-0.133	0.188
F-test: β_{15} across subsamples (p-value)		-0.906 (0.101)		
Number of firm-years	435		2,351	
Adjusted R^2 (%)	37.02		33.01	

Table 8 (Continued)

Panel C: Banks with an increase in either the proportion of assets bearing lower risk weights or in CDS holdings

	Dependent variable = EPS_t			
	Increase in either the proportion of assets bearing lower risk weights or in CDS holdings		No increase in either	
Variable	Coef.	P>t	Coef.	P>t
R(β1)	0.112	-0.393	0.026	0.803
D(β2)	0.252	0.004	0.194	0.010
D * R(β3)	1.584	0.000	1.104	0.000
CDS(β4)	0.002	0.899	-0.047	0.021
CDS * R(β5)	-0.086	0.046	0.095	0.036
CDS * D(β6)	0.009	0.793	0.037	0.241
CDS * D * R(β7)	0.245	0.014	-0.240	0.007
POST(β8)	0.004	0.856	0.000	1.000
POST * R(β9)	-0.005	0.895	0.073	0.102
POST * D(β10)	0.005	0.880	-0.028	0.461
POST * D * R(β11)	0.022	0.816	-0.482	0.000
CDS * POST(β12)	-0.030	0.265	0.039	0.138
CDS * POST * R(β13)	0.118	0.048	-0.070	0.242
CDS * POST * D(β14)	-0.047	0.320	0.012	0.795
CDS * POST * D * R(β15)	**-0.522**	**0.000**	**0.437**	**0.003**
Additional Controls	Included		Included	
Intercept (β_0)	-0.127	0.086	-0.082	0.315
Year and Industry fixed effects	Included		Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.404	0.001	0.367	0.005
F-test: β_{15} across subsamples (p-value)		-0.960 (0.000)		
Number of firm-years	1,296		1,490	
Adjusted R^2 (%)	0.311		0.369	

This table reports cross-sectional analysis of characteristics of banks lending to the firms in our sample. The sample period spans 2001 to 2010. Firms in financial industries are excluded. The dependent variable is EPS, defined as net income scaled by prior year's market value of equity. Panel A presents results for two sub-samples partitioned on whether there was an increase in the proportion of banks' assets risk-weighted at lower than 100% relative to total bank assets in the same year as CDS trade initiation. Banks lending to CDS and non-CDS firms in the sample are identified using data obtained from the LPC (Loan Pricing Corporation)'s Dealscan database, and the risk weights on banks' assets are from Federal Reserve's Y-9C reports. Panel B presents results for two sub-samples partitioned based on whether banks exhibit an increase in CDS portfolio holdings in the same year as CDS trade initiation on underlying borrowers. CDS portfolio holdings of banks are obtained from Federal Reserve's Y-9C reports. Panel C presents for situations in which either the conditions in Panel A or Panel B hold. In other words, banks exhibit an increase in either lower-risk-weighted assets or an increase in CDS portfolio holdings. R is twelve-month buy-and-hold returns starting nine months before the fiscal year end. D is an indicator variable equal to one if R is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. The matched control sample is chosen based on propensity score matching method, where propensity score model is described in Table 1. POST is an indicator variable equal to one if a year falls in the two-year period after the CDS-trade-initiation year, and zero if a year falls in the two-year period prior to the CDS-trade-initiation year for CDS firms. The matched control firms take on the same value of POST as the CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with R, D, and D × R. Year and industry fixed effects are included. P-values are derived based on robust standard errors clustered at the firm level.

Table 9
Robustness Analysis – Change in Conservatism Included in the First Stage Model

	Dependent variable = EPS_t	
Variable	Coeff. Est.	p-value
R_t (β_1)	-0.028	0.767
D_t (β_2)	0.182	0.007
$D_t \times R_t$ (β_3)	1.105	0.000
CDS (β_4)	-0.035	0.044
CDS × R_t (β_5)	-0.017	0.666
CDS × D_t (β_6)	0.036	0.157
CDS × $D_t \times R_t$ (β_7)	0.154	0.185
POST (β_8)	-0.006	0.534
POST × R_t (β_9)	0.011	0.626
POST × D_t (β_{10})	-0.007	0.761
POST × $D_t \times R_t$ (β_{11})	-0.110	0.302
CDS × POST (β_{12})	0.005	0.744
CDS × POST × R_t (β_{13})	0.048	0.177
CDS * POST × D_t (β_{14})	-0.022	0.487
CDS × POST × $D_t \times R_t$ (β_{15})	**-0.256**	**0.085**
Additional controls	Included	
Intercept (β_0)	-0.088	0.143
Year and Industry fixed effects	Included	
F-test: ($\beta_{13} + \beta_{15}$)	-0.208	0.097
Number of firm-years	4,002	
Adjusted R^2 (%)	29.05	

This table reports regression results on the relation between Basu's (1997) measure of asymmetric loss recognition timeliness and the onset of CDS trading based on the first stage model that includes the change in asymmetric loss recognition timeliness between one year before and one year after the onset of CDS trading. The firm specific asymmetric timeliness of loss recognition is computed as the Basu coefficient for the CSCORE quintile the firm belongs to. Firms in Compustat are sorted in quintiles each fiscal year based on CSCORE. CSCORE is computed following Khan and Watss (2009). The sample period spans 2001 to 2010. The dependent variable is EPS, defined as net income scaled by prior year's market value of equity. R is twelve-month buy-and-hold returns starting nine months before the fiscal year end. D is an indicator variable equal to one if R is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. POST is an indicator variable equal to one if a year falls in the two-year period after the CDS-trade-initiation year, and zero if a year falls in the two-year period prior to the CDS-trade-initiation year for CDS firms. The matched control firms take on the same value of POST as the CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with R, D, and D × R. Year and industry fixed effects are included. P-values are derived based on robust standard errors clustered at the firm level.

Table 10
Non-Returns Based Measure of Conservatism

Earnings time-series measure

	CDS firms and Matched firms	
Variable	Coeff. Est.	p-value
ΔE_t (γ_1)	0.163	0.662
D_t (γ_2)	-0.069	0.149
$D_t \times \Delta E_t$ (γ_3)	-0.184	0.822
CDS (γ_4)	-0.022	0.010
CDS × ΔE_t (γ_5)	0.307	0.044
CDS × D_t (γ_6)	0.000	0.982
CDS × $D_t \times \Delta E_t$ (γ_7)	-0.520	0.139
POST (γ_8)	-0.019	0.036
POST × ΔE_t (γ_9)	0.426	0.014
POST × D_t (γ_{10})	0.001	0.960
POST × $D_t \times \Delta E_t$ (γ_{11})	-0.910	0.010
CDS × POST (γ_{12})	0.006	0.640
CDS × POST × ΔE_t (γ_{13})	-0.499	0.043
CDS × POST × D_t (γ_{14})	0.012	0.611
CDS × POST × $D_t \times \Delta E_t$ (γ_{15})	**1.308**	**0.017**
Additional controls	Included	Included
Intercept (γ_0)	-0.119	0.000
Year and Industry fixed effects	Included	
Number of firm-years	4,209	
Adjusted R^2 (%)	28.86	

This table reports multivariate regression results on the relation between an earnings time-series measure of asymmetric loss recognition timeliness and the onset of CDS trading. The sample period spans 2001 to 2010. Firms in financial industries are excluded. The dependent variable is ΔE_t, the change in annual earnings before extraordinary item, scaled by lagged total assets. D is an indicator variable equal to one if ΔE_{t-1} is negative, and zero otherwise. CDS is an indicator variable equal to one if a firm has a CDS contract traded over the sample period, and zero for matched control firms. The matched control sample is chosen based on propensity score matching method, where propensity score model is described in Table 1. POST is an indicator variable equal to one if a year falls in the three-year period after the CDS-trade-initiation year, and zero if a year falls in the three-year period prior to the CDS-trade-initiation year for CDS firms. The matched control firms take on the same value of POST as the CDS firms in the pre- and post-CDS-trade-initiation year, respectively. Additional controls include firm size, market-to-book ratio, book leverage, and their corresponding interaction terms with ΔE_t, D_t, and $D_t \times \Delta E_t$. Year and industry fixed effects are included. P-values are based on robust standard errors clustered at the firm level.