RISK OR NOISE? AN EXAMINATION OF OFFSETTING FINANCIAL INSTRUMENTS

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ABSTRACT

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U.S. GAAP permits firms to offset a significant amount of financial assets and liabilities with the same counterparty, thereby keeping the offsetting financial instruments off the balance sheet. Currently, the offsetting standards represent the single largest difference in balance sheet presentation between U.S. GAAP and IFRS for large financial institutions (FASB 2011). The debate on whether the FASB should allow firms to offset financial instruments has drawn considerable attention from regulators and investors. The focus of this debate is on whether the offsetting financial instruments increase a firm's credit risk. I measure credit risk using credit default swap spreads and find that offsetting financial instruments are positively associated with a firm's credit risk. This relation is stronger for firms with higher asset opacity and after the 2011 FASB's proposal to tighten offsetting standards. In addition, I do not find that recognition versus disclosure significantly affects how debt investors use offsetting information in evaluating a firm's credit risk.

I dedicate this work to my wife and my parents.

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CHAPTER 1: INTRODUCTION

In this dissertation, I examine whether a firm's offsetting financial instruments are associated with credit risk. Under current U.S. GAAP, financial firms are allowed to offset a considerable amount of financial assets (e.g., derivatives and repurchase agreements) against financial liabilities with the same counterparty, so only the net amount is reported on the balance sheet. Offsetting financial instruments are those financial instruments that are eligible for off-balance sheet treatment, allowing the firm the choice to report the financial instruments on the net basis (i.e., net presentation). Alternatively, these offsetting instruments could be recognized on the balance sheet if the firm reports on the gross basis (i.e., gross presentation). The magnitude of offsetting financial instruments is economically significant, particularly for large financial institutions. For example, during the third quarter of 2011, Morgan Stanley recognized $54 billion of derivative assets on the balance sheet after offsetting $1,152 billion of derivative assets with the same amount of derivative liabilities. The offsetting amount even exceeds Morgan Stanley's total assets ($795 billion) for that quarter. In contrast with U.S. GAAP, IFRS imposes significantly more stringent standards for allowing firms to offset financial instruments, and as a result, most foreign financial firms present their financial instruments on the gross basis with limited offsetting between financial assets and liabilities. To date, the offsetting standards for financial instruments "account for the single largest quantitative difference in the amounts presented in statements of financial position prepared in accordance with U.S. GAAP and in the amounts presented in those prepared in accordance with IFRS" (FASB 2011a, p. 1).

A financial firm may have multiple financial assets and liabilities simultaneously with the same counterparty. U.S. GAAP (ASC 210-20) specifies conditions that must be met to permit the

firm to offset these assets and liabilities and only reports its net position on the balance sheet. The most important condition is that the firm must have the legal right to enforce the net settlement if the counterparty defaults. This legal right, often called the setoff right, effectively shields the firm's offsetting financial assets from potential losses caused by the counterparty's default.

The accounting standards relating to financial instrument offsetting have drawn considerable attention from regulators, academics, and investors, particularly after the financial crisis. In early 2011, the FASB issued an exposure draft to tighten the offsetting standards and converge with IFRS. However, after receiving feedback on the exposure draft, the FASB did not change the offsetting model apart from the inclusion of a new disclosure requirement. An important reason why the FASB retained the existing standards is that both financial regulators and preparers favor the use of net presentation under current U.S. GAAP. In their joint letter to the FASB, five regulatory agencies including the Federal Reserve and the Federal Deposit Insurance Corporation emphasize that net presentation reflects "the economic substance of an entity's exposures to and from its counterparties" (FASB 2011c). All big four U.S. banks (i.e., JP Morgan, Citigroup, Bank of America, and Wells Fargo) strongly support keeping offsetting financial instruments off the balance sheet. In addition, the International Swaps and Derivatives Association (ISDA) issued a special report arguing that recognizing offsetting financial instruments on the balance sheet "misrepresents and obscures the firm's real economic risks" (ISDA 2012). Their rationale is that the legal setoff right required for the offsetting treatment is sufficient to ensure the net settlement upon the counterparty's default, making the offsetting financial instruments irrelevant even when the default risk is realized. As a result, recognizing

the offsetting financial instruments "would impair rather than improve financial reporting by providing less relevant information to financial statement users" (FASB 2011c).

However, several economists point out that this argument overlooks the destabilizing effect of offsetting financial instruments that occurs when the firm *itself* faces a negative economic shock (Admati and Hellwig 2013; Parson 2013). Specifically, large modern financial institutions increasingly rely on short-term debt to finance their investments. Unlike deposits, these short-term debt is not covered by government insurance and thus expose the firm to the risk of bank runs. When an adverse economic shock occurs and triggers a panic among creditors, the firm with more offsetting financial instruments could suffer a large-scale bank run in the short-term debt markets. A larger bank run potentially dries up the firm's liquidity and increases the likelihood of bankruptcy. Recent finance studies show that the bank runs in the shadow banking system contributed to the collapse of several of the largest banks during the financial crisis of 2007-2009 (e.g., Brunnermeier 2009; Duffie 2010). It is plausible that the offsetting financial instruments fueled the negative impact of bank runs on the firm's solvency.[1]

Although a vigorous debate has been taking place on whether offsetting financial instruments increase a firm's credit risk, there are no empirical studies that systematically examine the risk implications of offsetting financial instruments. In this study, I manually collect offsetting amount of financial instruments from firms' 10-K/Q fillings. I identify 78 U.S. financial firms that disclose the offsetting amount during the period of 2007 to 2014. On average, these firms account for about 62% of the total assets of all the U.S. financial institutions in *Compustat* during the sample period. I examine whether offsetting financial instruments are associated with a firm's credit risk and if so, whether this association varies across firms and

[1] In the next section, I use the failure of Bear Stearns to illustrate how offsetting financial instruments potentially increase a firm's credit risk.

periods. In addition, I collect offsetting amounts for a sample of foreign financial firms from their 20-F (40-F) fillings or annual reports to examine whether recognition versus disclosure affects how investors price risks of offsetting financial instruments.

First, I quantify the magnitude of offsetting financial instruments. I find that, on average, the offsetting amount is 7% of total assets for the 78 U.S. firms in my sample.[2] The ratio of the offsetting amount to total assets is particularly large for largest firms. For the 20 largest financial firms during the period of 2007-2014, inclusion of the offsetting amount on the balance sheets increases their average leverage ratio (i.e., total liabilities/shareholders' equity) from 13.0 to 16.5.

In addition, I find that 41% of U.S. financial firms in my sample voluntarily select gross presentation despite the fact that using net presentation can lower their reported leverage ratios. The fact that 59% of U.S. firms use net presentation is consistent with the FASB's notion that "most U.S. preparers note a preference for current U.S. GAAP offsetting guidance" (FASB 2011b). Using a multivariate regression, I show that the magnitude of offsetting financial instruments is the only significant predictor of firms' presentation choices. That is, when there is a significant amount of financial instruments eligible for offsetting, the firm is more prone to keep them *off* the balance sheet.

Second, I examine whether offsetting financial instruments are associated with a firm's credit risk. I use credit default swap (CDS) spreads as the proxy for a firm's credit risk. CDS spreads are a better risk measure than bond spreads or credit ratings because a CDS has fewer contractual provisions, is less subject to liquidity risk, and is immune to subjective adjustment (Stulz 2010; Griffin and Tang 2012). I find that offsetting financial instruments are positively

[2] Total assets are adjusted to exclude the offsetting amount of financial instruments in cases where the firm uses gross presentation.

associated with a firm's CDS spreads. A one standard deviation increase in the ratio of offsetting financial instruments to total assets is associated with a 19% increase in CDS spreads. This evidence suggests that debt investors price risks of offsetting financial instruments despite the fact that they would be netted out in the event of default.

In cross-sectional analyses, I examine whether the risk relevance of offsetting financial instruments varies with a firm's asset opacity. Holmstrom (2015) argues that while asset opacity enables banks to better provide liquidity to the markets, it causes banks to be susceptible to bank runs. As asset opacity increases the likelihood of a bank run, investors should find the offsetting information of financial instruments more relevant in evaluating the firm's credit risk. Following Morgan (2002), I use disagreement among rating agencies as a proxy for asset opacity. Consistent with my prediction, I find that the association between CDS spreads and offsetting financial instruments is stronger for firms with larger rating disagreements.

In addition, I find the risk relevance of offsetting financial instruments is stronger after the FASB's exposure draft in 2011. This proposal represents a major event that brought the gap in offsetting standards between IFRS and U.S. GAAP to light and received considerable attention from the media (e.g., Reilly 2011; Thomas 2011). The FASB's attempt to recognize offsetting financial instruments on the balance sheet could be interpreted by the markets as a signal that these instruments may not be as risk-free as people thought. Specifically, I find that the association between offsetting financial instruments and credit risk is significant only in the post-2011 period. This finding is consistent with journalists' observations that "while investors haven't traditionally paid that much attention to the gross figures, they have become more relevant amid worries about financial contagion" (Reilly 2011).

Finally, I examine whether recognition versus disclosure of offsetting financial instruments affects the use of such information in pricing a firm's credit risk. Addressing this question helps shed light on the debate over whether accounting standard setters should require firms to use gross presentation or continue allowing firms to use net presentation with offsetting financial instruments disclosed in the footnotes. My identification strategy is to compare the sample of firms that select net presentation under U.S. GAAP with the sample of firms that likely would have selected net presentation but are required by IFRS to use gross presentation. I find that although the valuation coefficient on the offsetting financial instruments is higher for firms using gross presentation relative to the firms using net presentation, the difference is not statistically significant. While the results confirm that the offsetting financial instruments are also priced in the foreign "gross" sample, I do not find evidence that recognition versus disclosure significantly affects how investors use offsetting information in pricing a firm's credit risk.

This dissertation makes three contributions. First, it contributes to the literature on the role of financial reporting in the financial crisis. Most studies in this area focus on fair value accounting and asset securitization (e.g., Ryan 2008; Landsman et al. 2008; Cheng et al. 2011; Badertscher et al. 2011). Accounting research on derivatives and repurchase agreements is relatively scarce, despite the fact that these financial instruments also played an important role during the financial crisis (Barth and Landsman 2010). Acharya and Ryan (2015) state that relative to fair value accounting, presentation of financial instruments with concentrated risks and covered by netting agreements "has more direct and significant implications for stability" (p. 11). To my knowledge, this is the first paper that empirically documents the magnitude of

offsetting financial instruments among U.S. firms and examines its implications for a firm's credit risk.

Second, the paper contributes to the growing literature on the risk relevance of accounting information. Compared with research in value relevance, fewer works have examined the importance of accounting information in evaluating a firm's risk. Risk relevance research is particularly meaningful for the financial industry because the failures of financial institutions impose an externality on the rest of economy (Giesecke et al. 2014). Some prior studies investigate equity risk associated with financial instruments (e.g., Hodder et al. 2006; Riedl and Serafeim 2011), while others focus on credit risk (e.g., Ahmed, et al. 2011; Barth et al. 2012; Blankespoor et al. 2013). This paper complements the second stream of research using the CDS spreads as a proxy for credit risk.

Finally, the paper offers policy implications to current accounting standard setters. I find that offsetting financial instruments are positively associated with CDS spreads, suggesting that debt investors incorporate the offsetting information of financial instruments in evaluating a firm's credit risk. These results support the disclosure requirement mandated by the FASB and the IASB. However, I do not find evidence that recognition versus disclosure of offsetting financial instruments makes a significant difference in how investors use such information to price a firm's credit risk. This finding suggests that the current disclosure requirement may be adequate at least for investors in debt markets.

CHAPTER 2: INSTITUTIONAL BACKGROUND AND HYPOTHESES

U.S. GAAP generally permits a firm to offset financial assets against financial liabilities with the same counterparty on the balance sheet if the firm has 1) the setoff right and 2) the intent to set off. IFRS standards on offsetting share the same principle but differ from U.S. GAAP in two important aspects that restrict the amount that can be offset under IFRS relative to U.S. GAAP. First, IFRS requires that the setoff right must be legally enforceable in all circumstances including the normal course of business. In contrast, U.S. GAAP only requires a setoff right to be conditional on the counterparty's default or bankruptcy. Second, U.S. GAAP exempts derivatives and repurchase agreements from the intent requirement if they are placed under master netting arrangements, while IFRS provides no exception to the intent requirement.[3,4] The financial instruments eligible for offsetting are primarily derivatives, but also include repurchase agreements and securities lending.

The conditional setoff right required for the offsetting treatment under U.S. GAAP refers to the legal right that enforces the net settlement if the counterparty defaults. The existence of the setoff right can significantly reduce the creditor's potential losses. For example, assume a bank named *Beta Bank* owes one of its clients (*Client*) $1,000 and at the same time this client also owes *Beta Bank* $800. If *Beta* goes bankrupt and is only able to pay creditors 5% of the face value of its debt, the presence of the setoff right allows *Client* to first offset its $1,000 receivable

[3] Although repurchase agreements are exempted from the intent requirement, the FASB stipulates additional conditions on settlement dates, transfers of securities, etc. that should be met for offsetting treatment.

[4] According to FIN 39, "A master netting arrangement exists if the reporting entity has multiple contracts, whether for the same type of conditional or exchange contract or for different types of contracts, with a single counterparty that are subject to a contractual agreement that provides for the net settlement of all contracts through a single payment in a single currency in the event of default on or termination of any one contract".

against its $800 payable, which reduces *Client*'s net exposure to $200. As a result, *Client* receives $10 (5% × $200) and suffer a loss of $190 in the end. However, if the setoff right is not present, *Client* has to pay *Beta* the entire $800 first but only receives back $50 (5% × $1,000), so it suffers a loss of $950 at the conclusion of *Beta*'s bankruptcy. Therefore, the setoff right reduces *Client*'s losses by $760 ($950-$190).

The legal setoff right is the central reason that the U.S. financial regulators believe net presentation reflects the economic substance of an entity's risk exposure to its counterparties. As illustrated in the example above, as long as the setoff right is legally enforceable and can be upheld in bankruptcy, the offsetting amounts (i.e., $800) are fully protected and thus are essentially risk-free. In addition, the International Swaps and Derivatives Association finds no instance where the legal enforceability of netting agreements did not hold up in the event of bankruptcy in the United States or internationally (ISDA 2010). On the other hand, if the counterparty does not default or go bankrupt, the future cash inflows from the firm's claim against the counterparty will eventually offset against cash outflows from the firm's obligation to the counterparty over the long run. Therefore, financial regulators believe that the offsetting financial instruments do not matter with respect to a firm's credit risk, whether or not the counterparty defaults.

In contrast, economists point out that the offsetting financial instruments could potentially increase a firm's credit risk (Admati and Hellwig 2013; Parson 2013). Their main rationale is that the offsetting financial instruments can impose a destabilizing effect on the firm when it experiences a negative economic shock. I use the example above to illustrate the underlying mechanism. Because of the setoff right, *Client* losses $190 when *Beta* defaults. Although the $190 loss is less than the $950 loss without the setoff right, it is still worse than

losing nothing. In order to avoid such a loss, *Client ex ante* has an incentive to "novate" its $1,000 receivable from *Beta* to a third party (*Gamma Bank*) before *Beta* actually defaults.[5] After novation, *Gamma* owes money to *Client* and *Beta* owes money to *Gamma*, so *Client* is no longer exposed to *Beta*'s counterparty risk. As more of *Beta*'s clients sense *Beta* is in distress, the demand for novation will increase. The incentives to unwind the exposure to *Beta* are further reinforced by the coordination problem when every lender expects others would do the same (Diamond and Dybvig 1983). On the other side, *Gamma* is willing to take the position of *Beta*'s clients because *Gamma* has a tighter collateral agreement with *Beta*. The tight collateral agreement allows *Gamma* to force the already distressed *Beta* to post significantly more collateral (typically in cash) for the additional $1,000 asset position after novation (Yavorsky 2008). By doing so *Gamma* minimizes its risk exposure to *Beta*, but simultaneously exacerbates *Beta*'s liquidity condition. Furthermore, a systematically large volume of novation may exceed the risk capacity of *Gamma*, so *Gamma* has to decline the requests at some point. But the refusal to novate could lend credence to concerns about *Beta*'s counterparty risk among *Beta*'s clients and even trigger a greater "bank run".

This is consistent with what happened to Bear Stearns during the financial crisis.[6] In early March 2008, Bear Stearns' derivative counterparties became increasingly concerned about Bear Stearns' financial health after observing a series of negative news events including rating downgrades and the swirling rumors about its liquidity condition. The panicked clients raced to unwind their exposure to Bear Stearns by novating their positions to other dealers. During the process, Bear Stearns was forced to pay billions of dollars in cash collateral to calm its

[5] Novation refers to the transfer of the rights and/or obligations between legal entities. It is a common practice for unwinding a derivative transaction. Other practices to unwind a transaction include termination and initiating offsetting trades (Murphy 2013).
[6] See more details in Burrough (2008), Cohan (2010), and Financial Crisis Inquiry Commission (2011).

counterparties.[7] Meanwhile, several Wall Street banks such as Goldman Sachs suddenly experienced a huge volume of novation requests that they were forced to temporarily decline. However, the novation refusals were interpreted by the markets as a signal that even Goldman Sachs did not want to take on additional exposure to Bear Stearns, causing a bigger bank run and spreading panic to the repo markets. On March 13, one day after the novation refusal went public, the repo lenders stopped rolling over their funding, which effectively became the last straw.

As derivative clients reduced their exposure to Bear Stearns by systematically novating their positions to a third party, the derivative positions that were previously offset by Bear Stearns were no longer eligible for offsetting. This occurred because one side of the derivative positions was now with a separate party and Bear Stearns could no longer offset the novated positions with other positions with the original counterparty. Therefore, as Bear Stearns' clients increasingly novated their assets to Goldman Sachs, the financial instruments previously offset with these clients were gradually brought back onto Bear Stearns' balance sheet. If we were to take snapshots of this process, we would see the balance sheet effectively approaching the one that would be prepared using gross presentation.

The idea that the setoff right eliminates the risk of offsetting financial instruments is that it effectively consolidates individual contracts into a single agreement between the parties and thus only the net value matters. But the problem is that individual contracts may not always stick together and can be separated through novation. In the normal period, novation may not impose significant risk on a bank because asset positions and liability positions novated by clients should largely offset each other. It is analogous to deposit markets where some customers deposit

[7] Financial Crisis Inquiry Report shows that Bear Stearns paid $1.1 billion for margin calls from 142 concerned derivatives counterparties on March 12, 2008 (p. 288).

money to the bank while others withdraw money from the bank at the same time. However, when the bank is in distress, novation could become systematic: clients have more incentives to novate their asset positions than liability positions to a third party. This is essentially a bank run in the derivative markets, similar to a bank run in deposit markets where the customers only have incentives to withdraw their money out of the bank when the bank is in distress. In short, risks of offsetting financial instruments stem from the possibility of systematic novation, and a firm with more offsetting financial instruments is prone to suffer a larger-scale bank run if a bank run actually occurs. These arguments lead to the first hypothesis, stated in alternative form:

H1: Offsetting financial instruments are positively associated with a firm's credit risk.

To the extent that offsetting financial instruments are informative about the potential scale of bank runs, investors should perceive offsetting information to be more risk relevant for firms with a higher likelihood of suffering a bank run. Recent analytical studies highlight that firms' asset opacity is one explanation for the occurrence of bank runs. For example, Holmstrom (2015) and Dang et al. (2014) suggest that while opacity enables banks to better provide liquidity to the markets, it also exposes banks to the risk of bank runs.[8] A sudden negative shock to the bank may trigger the bank's debtholders to question the fundamental value of the debt securities they hold. If the bank holds more opaque assets, the debtholder would be more concerned that other debtholders hold certain private information he does not know. An adverse selection problem thus arises due to asymmetric information among debtholders. The fear of adverse selection reduces the value of the debt securities and possibly leads to a bank run. Further, opacity facilitates the spread of rumors that are difficult to verify (Fohlin et al. 2015). These

[8] In their studies, asset opacity is defined as the difficulty of assessing the underlying value of assets by the outside investors. The assets with higher opacity are more difficult to value and require more costly information acquisition.

rumors can create panic among investors, exacerbating the information asymmetry problem and leading to bank runs (He and Manela 2015).

There is some anecdotal evidence from the failure of Bear Stearns that supports this argument. Before its collapse, rumors circulated that Bear Stearns had serious liquidity problems. Journalists speculate that these rumors are one of the major factors that fueled the run in the derivative markets (Burrough 2008; Cohan 2010).[9] However, Bear Stearns did not have serious liquidity problems at that time. The SEC was closely monitoring Bear Stearns' liquidity pool and found "no significant issues" even a few days before the bank run began (Financial Crisis Inquiry Commission 2011). What could make people mistakenly believe that Bear Stearns had a liquidity problem was its opaque assets, particularly the significant amount of mortgage-related assets it held. These complex securities were inherently difficult to value and exposed Bear to large losses with the fall in the subprime mortgage markets.[10] These arguments lead to the first sub-hypothesis, stated in alternative form:

H1a: The association between offsetting financial instruments and a firm's credit risk is stronger for firms with higher asset opacity.

If the risk relevance of offsetting financial instruments increases with the likelihood of bank runs and investors are fully aware of their risks throughout the entire period, I expect these instruments should be generally more risk relevant in the period of 2007 to 2010 than afterward. However, anecdotal evidence suggests that investors may not pay adequate attention to offsetting financial instruments in the early period. For example, Pickel (2008) and Wood (2008) emphasize how substantially the setoff right reduces a firm' risk exposure, arguing that the net

[9] For example, Burrough (2008) describes the failure of Bear Stearns as "a 'run' on a major investment bank, caused in large part not by a criminal indictment or some mammoth quarterly loss but by rumor and innuendo that, as best one can tell, had little basis in fact."

[10] At the end of 2007, Bear Stearns held $46.1 billion of mortgage-related assets and wrote off $1.9 billion in the fourth quarter alone. Its total equity was only $11.8 billion at that time.

amount best represents a firm's risk exposure. Then the FASB released an exposure draft in early 2011, proposing to significantly tighten offsetting standards in the U.S. GAAP to close the gap with the IFRS. The FASB conducted extensive outreach including meeting with financial statement users, clearinghouses, and industry groups. These actions possibly increased investors' awareness of risks of offsetting financial instruments.

Journalists' observations support this possibility. For example, Reilly (2011) states that "while investors haven't traditionally paid that much attention to the gross figures, they have become more relevant amid worries about financial contagion". Also, more subsequent newspaper articles started to question whether banks are using offsetting accounting to hide their risks (e.g., Onaran 2013; Norris 2013). Therefore, it is likely that investors price offsetting financial instruments differently between the periods of 2007 to 2010 and of 2011 to 2014, but it is unclear in which period offsetting financial instruments are priced to a greater extent. Our second sub-hypothesis is stated in the null form as follows:

H1b: The association between offsetting financial instruments and a firm's credit risk is not significantly different between the periods of 2007 to 2010 and 2011 to 2014.

If offsetting financial instruments are risk relevant, the disclosure of offsetting information helps investors better evaluate a firm's credit risk. The next question is about where to report these instruments. Although the FASB and the IASB have both required the offsetting amount be disclosed in the footnote since 2013, they still differ on the balance sheet presentation. Specifically, firms are allowed to not recognize offsetting financial instruments on the balance sheets under the U.S. GAAP but they would be required to recognize the same instruments on the balance sheets if they report under the IFRS.

Prior literature suggests that recognition versus disclosure matters for contracting (or regulation) and investing reasons (Bernard and Schipper 1994). Contracts and regulations often hinge on recognized items instead of disclosed ones, and recognition of a previously disclosed item could affect a firm's risk or value through its effect on the strictness of debt covenants or regulatory ratios (e.g., Espahbodi et al. 2003). With respect to offsetting financial instruments, recognizing them on the balance sheets could significantly affect several regulatory capital ratios including the Tier 1 leverage ratio and the tangible equity ratio (FASB 2011d).[11] Lower regulatory ratios caused by the recognition of offsetting financial instruments may help constrain banks' risk taking (Acharya and Ryan 2015). However, in order to empirically examine whether recognition versus disclosure influences a firm's risk, one need a setting where firms (are forced to) switch from disclosure (recognition) to recognition (disclosure) to observe how a firm changes its behavior. And I cannot examine this question as most firms in my sample use either net presentation or gross presentation consistently through the entire period. So instead, I examine whether recognition versus disclosure matters from the investing perspective.

Most prior literatures find that recognition improves value relevance of accounting information that is previously disclosed (e.g., Aboody 1996; Ahmed et al. 2006; Müller et al. 2015). They provide two reasons for the difference in valuation between recognized and disclosed information. First, investors have limited attention and may not process all the information in the financial statements. Second, the recognized items are more reliable than disclosed ones. In my study, the lower information processing costs and higher reliability associated with recognition may cause investors to assign a higher weight to offsetting financial instruments that are recognized on the balance sheets than those disclosed in the footnotes. As a

[11] Note that recognition of offsetting financial instruments does not affect the Tier 1 capital ratio because they are excluded in calculating risk-weighted assets.

result, I expect a stronger association between offsetting amount and credit risk for firms that use gross presentation than for firms that use net presentation. Stated in alternative form:

H2: Offsetting financial instruments are more positively associated with a firm's credit risk for firms that recognize offsetting financial instruments on the balance sheets than firms that disclose them in the footnotes.

CHAPTER 3: SAMPLE SELECTION

Given the effort involved in manually collecting offsetting information and the anecdotal evidence that big firms tend to have offsetting financial instruments (e.g., Onaran 2013), I start with the largest 100 U.S. (non-U.S.) financial firms during this period from the North America (Global) Section of *Compustat*. I define financial firms as firms whose first two digit SIC code is between 60 and 69 and rank them based on their average total assets during the period of 2007 to 2014. To increase the sample size for examining risk implications of offsetting financial instruments, I supplement the data with financial firms that either issue bonds or serve as a reference entity for a CDS during the period of 2007 to 2014. I collect the information of bond issuers and CDS reference entities from *Mergent Fixed Investment Securities Database* (FISD) and *Markit*, respectively. I manually collect information about offsetting financial instruments from 10-K/Qs for U.S. firms and from 20-Fs, 40-Fs, and annual reports for non-U.S. firms.[12] I exclude firms that do not disclose information about offsetting financial instruments in their SEC filings or annual reports. For the U.S. sample, I also exclude firms that are subsidiaries of foreign banks (e.g., HSBC North American Holding Inc.) and government-sponsored enterprises (e.g. Fanne Mae). My initial sample includes 78 U.S. financial institutions and 98 non-U.S. financial institutions. See Table 1 for more details on sample construction and Appendix C and D for the full list of firms included in my sample.

[12] Because I focus on financial instrument offsetting in this study, I do not include the offsetting amount between cash collateral and financial instruments if it is separately disclosed from the offsetting amount between financial instruments. I use total offsetting amount instead if the firm does not separately disclose these two types of offsetting. Including the offsetting collateral often causes the total offsetting amount of financial assets to slightly differ from total offsetting amount of financial liabilities. When this happens, I use the total offsetting amount of financial assets to calculate the key variable *Offsetting*.

Although the FASB requires all firms to disclose offsetting information in the 10-K/Q footnotes beginning in January 2013 (FASB 2011b), many U.S. firms voluntarily disclose such information in the pre-2013 period (Abdel-khalik 2014). The Y-9C reports which bank holding companies file with the Federal Reserve include the offsetting information of derivatives and repurchase agreements since June 2009. However, I do not use Y-9C as my primary data source because a considerable percentage of bank holding companies voluntarily select gross presentation. Because these firms do not offset assets and liabilities on the balance sheet, they report no offsetting amounts in their regulatory filings. But this does not mean that they have no financial instruments that could be offset, if they selected net presentation. Thus, I supplement with data from BHC regulatory filings in cases where the firm reports positive offsetting amounts in their Y9-C reports, but did not simultaneously disclose the information in the 10-K/Q filings between June 2009 and January 2013. I also manually collect the offsetting information of financial instruments for foreign financial institutions from 20-F filings, 40-F filings, or their annual reports.[13]

Following previous studies, I focus on five-year CDS contracts written on senior unsecured debt. I obtain CDS information from the *Markit* Database. For each firm, I create monthly CDS spreads by using the last quotation in each month and match them to the most recent quarterly financial information of the firm. I successfully match financial statement information of 47 U.S. firms (74 foreign firms) in my original U.S. (non-U.S.) sample to their monthly CDS quotes. For U.S. firms, I restrict my sample to CDS contracts with the Modified Restructuring clause and denominated in U.S. dollars because they are the most common type of CDS traded in the U.S. markets (Zhang et al. 2009). For foreign firms, I restrict my sample to

[13] Given the effort involved in manual collection, I collect the offsetting information on the annual basis instead of quarterly for foreign banks.

CDS contracts denominated in either U.S. dollars or Euros. I construct the foreign CDS sample with different criteria because a CDS denominated in Euro accounts for the largest market share outside the U.S. markets and the types of clauses are also diversified. To mitigate the concern that my results are affected by currencies and clauses, I include the exchange rate between U.S. dollar and Euro, currency fixed effects, and clause fixed effects as control variables in the regression analyses.

Firm characteristics such as total assets, loans, and deposits are collected from *Bloomberg*. All financial information of foreign firms is converted to U.S. dollars if they use non-U.S. currencies in their SEC filings or annual reports.

CHAPTER 4: RESEARCH DESIGN

4.1 Regression Model

I examine whether offsetting financial instruments are associated with a firm's credit risk using a research design similar to Barth et al. (2012). I follow their design for two reasons. First, their study and mine both examine the relation between an off-balance-sheet item and credit risk. Barth et al. (2012) focus on the securitized assets sold to special purpose entities (SPEs) while I focus on offsetting financial instruments. Second, the arguments that justify the off-balance sheet treatment are similar: from the legal perspective, firms should bear neither the risk associated with securitized assets sold to SPEs nor the risk associated with offsetting financial instruments. The former is because the control rights of assets are transferred to SPEs and the latter is because the setoff right exists between two counterparties.

The main model used in Barth et al. (2012) regresses bond spreads as the proxy for credit risk on securitized assets and retained interests controlling for other firm characteristics such as firm size and leverage. Similarly, I set up my model as follows:

$$Log\ (CDS\ Spread) = \alpha + \beta_1 Offsetting + Firm\text{-}level\ characteristics + CDS\text{-}level\ characteristics + Year\ fixed\ effects + Industry\ segment\ fixed\ effects + \varepsilon$$

I use CDS spreads as the proxy for credit risk in this study. The CDS contract is the most common credit derivative used to transfer the credit risk of a given firm (i.e., reference entity) between two parties. The CDS buyer pays a premium periodically to the CDS seller over the life of the contract. This periodic payment is defined as a percentage of the notional amount and the percentage represents the CDS spread. If a pre-specified credit event such as bankruptcy occurs to the reference entity before the contract ends, the CDS buyer will be compensated by the CDS

seller. Following Callen et al. (2009), I use the natural logarithm of the CDS spread as my proxy for credit risk. A higher CDS spread represents higher credit risk.

A CDS has several appealing features that make its spreads a better proxy for credit risk. Compared with a bond, a CDS has fewer contractual provisions (i.e., options, covenants, etc.) that mechanically affect spreads. Because the CDS markets are more liquid than the secondary bond markets, CDS spreads should be less subject to liquidity risk (Longstaff et al. 2005). The CDS markets also lead bond markets in price discovery (Blanco et al. 2005). Compared with credit ratings, the CDS spread is a market-based measure and thus is immune to artificial adjustments (Griffin and Tang 2012; Efing and Hau 2015). A potential limitation to using CDS spreads is that a CDS spread might incorporate the counterparty risk of the CDS seller. However, this concern is mitigated by findings in Arora et al. (2012), who provide empirical evidence that the effect of counterparty risk on CDS spreads is economically small and does not exist for financial firms.

The key explanatory variable (*Offsetting*) is the offsetting amount of financial instruments scaled by total assets. Total assets are adjusted to exclude the offsetting amount of financial instruments in cases where the firm uses gross presentation. In appendix B, I provide a detailed explanation for the construction of this variable. If CDS investors price the risk of offsetting financial instruments, I expect β_1 to be significantly positive. However, if they do not price the risk of offsetting financial instruments, I expect β_1 to be insignificantly different from zero. I control for the firm's net position in financial instruments eligible for offsetting (*Net Position*). For example, if the firm offsets derivative assets and derivative liabilities on the balance sheet, *Net Position* equals net derivative assets minus net derivative liabilities and thus represents the fair value of all derivatives (Venkatachalam 1996). In addition, I control for firm

size (*Log* (*Total Assets*)), leverage (*Leverage*), profitability (*Return on Assets*), liquidity (*Cash*), loans (*Loans* and *Non-Performing Loans*), deposits (*Deposits*), and regulatory capital ratios (*Tier 1 Capital Ratio* and *Tier 1 Miss*).[14] All firm-level control variables are scaled by total assets. Finally, I include two CDS-level control variables. One is the recovery rate (*Recovery Rate*), defined as the percentage of par value that the CDS investors expect to receive after credit events (e.g., rating downgrade and bankruptcy), where a higher recovery rate reduces the CDS spread. The other is a binary variable that equals to 1 if the CDS contract is under the 2014 ISDA Credit Derivative Definition and 0 if the CDS contract is under the 2003 ISDA Credit Derivative Definition (*ISDA2014*). Both variables are directly obtained from the *Markit* database. The standard errors in all tests are clustered at the firm level. I provide the variable definitions and data sources in Appendix A.

4.2 Recognition versus Disclosure

A large number of previous studies examine whether recognition versus disclosure affects how investors use accounting information. Some studies compare firms that select to recognize accounting numbers with firms that select to disclose it during the same period (e.g., Aboody 1996), while other studies focus on the within-firm comparison between the disclosure period and the recognition period (e.g., Davis-Friday et al. 1999; Ahmed et al. 2006). The research designs across both groups of studies are subject to limitations. The first group is subject to a self-selection problem as the factors that determine a firm's presentation choices may cause investors to use accounting information differently. The second group is subject to a confounding event problem as other events occurring at same time could also affect the use of

[14] Firms that do not have loans or deposits are assigned zero for *Loans*, *Non-Performing Loans*, and *Deposits.*

accounting information by investors, which biases the true difference between recognition and disclosure (Bernard and Schipper 1994).

My study belongs to the first group and thus faces the same self-selection problem. To mitigate this problem, I do not empirically compare U.S. firms that voluntarily select net presentation with U.S. firms that voluntarily select gross presentation. Instead, my approach is to compare a sample of firms that voluntarily select net presentation under the U.S. GAAP with a sample of firms that likely would have selected net presentation but are required by IFRS to use gross presentation.

CHAPTER 5: EMPIRICAL ANALYSES

5.1 The Magnitude of Offsetting Financial Instruments

I first present the magnitude of offsetting financial instruments in Table 2. I find that the offsetting amount of financial instruments is on average 7.08% of total assets for U.S. firms and 8.95% for non-U.S. firms. I partition the U.S. sample and the non-U.S. sample based on whether the firm is among the top 20 firms with the largest average total assets during the sample period, respectively. I find the offsetting percentage is particularly large for the largest firms. For the largest 20 U.S. financial firms, the offsetting amount of financial instruments is on average 22.33% of total assets. Including offsetting financial instruments increases their leverage ratios (total liabilities divided by shareholders' equity) from 13.0 to 16.5. Similarly, the average offsetting amount is 19.22% of total assets for the largest 20 non-U.S. firms. However, the offsetting financial instruments are relatively small for the smaller financial firms. The average offsetting amount is 1.82% (6.31%) of total assets for U.S. firms (non-U.S. firms) other than top 20 largest firms.

5.2 Which U.S. Firms Select Net Presentation for Financial Instruments?

Table 3 reports the descriptive statistics and the regression results that explain U.S. firm selection of net versus gross presentation. Current U.S. GAAP allows but does not require using net presentation, so the firm has discretion to select whether to recognize the offsetting financial instruments on the balance sheet or keep them off the balance sheet. To date, most media critics focus on offsetting accounting at the largest banks such as Citigroup (e.g., Reilly 2011; Onaran 2013; Norris 2013). Because these firms typically use net presentation, it might give a misleading impression that all U.S. firms take advantage of this accounting rule and select net

presentation whenever possible. I examine whether this is the case and report the results in Panel A. Surprisingly, I find that 41% (31 of 76) of U.S. financial firms voluntarily select gross presentation even though using net presentation could lower their reported leverage ratio.[15] The percentage of firms that use gross presentation is similar across different industry segments. For example, 44% (16 of 36) of commercial banks select to use gross presentation.

Since a significant portion of U.S. firms choose to recognize eligible offsetting financial instruments on their balance sheets, I investigate firm characteristics that could explain their choices and report the results in Panel B. No prior studies have suggested what characteristics should matter in terms of a firm's presentation choices, so this test is exploratory in nature. I consider the offsetting amount of financial instruments (*Offsetting*), firm size (*Log of Total Assets*), leverage (*Leverage*), profitability (*Return on Assets*), and liquidity (*Cash*) as potential determinants of the presentation choices. This choice is likely to be based on the firm's current financial position and the expectation of its future financial position, because U.S. GAAP requires that firms use the same presentation consistently. Therefore, I conduct the analyses on a cross-sectional basis with the *average* values of independent variables during the sample period. I find that only the offsetting amount of financial instruments is significantly associated with the firm's presentation choice. This implies that when a firm has a larger amount of financial instruments eligible for offsetting, the firm is more likely to keep it off the balance sheet. In addition, I examine whether the leverage ratio mediates the relation between offsetting financial instruments and presentation choice. As the leverage ratio increases, firms may have stronger incentives to reduce their leverage by offsetting assets and liabilities. However, I find that neither the leverage ratio nor its interaction with offsetting amount is significantly associated with the presentation choice.

[15] See Appendix E for an example of U.S. firms that voluntarily choose to use gross presentation.

5.3 Descriptive Statistics

Table 4 presents descriptive statistics for variables that I use in the main regression tests. After merging the offsetting information to the CDS data, my sample includes 47 U.S. financial firms (757 firm-quarters) and 77 non-U.S. financial firms (208 firm-years) during the period of 2007-2014. The mean for the ratio of offsetting financial instruments to total assets (*Offsetting*) is 15.95%, which is higher than the average value of *Offsetting* (7.08%) shown in Table 2. This is because larger financial firms are more likely to serve as the reference entity of CDS contracts and they also tend to have higher offsetting amounts of financial instruments. The mean (median) of total assets of the U.S. firms in the regression sample is $580.3 (266.4) billion, suggesting these firms represent the largest financial institutions in the U.S. markets. The mean (median) of CDS spreads for the U.S. sample is 2.05% (1.15%). It means that, on average, CDS buyers pay CDS sellers $2.05 per year for the protection of $100 face value of bonds issued by the reference entity.

5.4 Regression Results

5.4.1. Do Investors Price the Risk of Offsetting Financial Instruments?

Table 5 column (1) presents the main results of this study. I control for bank characteristics (e.g., loans), industry fixed effects, and year fixed effects in the regressions. I find that offsetting financial instruments are significantly and positively associated with CDS spreads, suggesting that investors price the risk of offsetting financial instruments despite the fact that these financial instruments could be net out in the event of default. The coefficient on *Offsetting* is 0.601, suggesting that a one standard deviation increase in offsetting financial instruments (i.e., 0.317 at the CDS level; untabulated) is associated with a 19% (i.e., 0.601 × 0.317) increase in CDS spreads. Regarding control variables, I find that a firm's total assets are negatively

associated with its CDS spreads, consistent with the argument that "too big to fail" financial firms have lower credit risk. In addition, I find that the Tier 1 capital ratio is positively associated with CDS spreads. It may appear puzzling at first sight because a firm with a higher capital ratio should be better capitalized and thus has a lower risk. However, this result can be possibly explained by regulatory arbitrage undertaken by financial firms. Recent studies show that large financial institutions adopt various approaches to reduce their regulatory capital burden without actually distributing risk to outsiders (e.g., Acharya et al. 2013). The prevalence of regulatory arbitrage could reduce the ability of regulatory capital ratios to capture a bank's underlying risk.[16]

In addition, I construct an alternative leverage ratio that includes the offsetting amount and examine whether this leverage ratio is more associated with a firm's credit risk than the one that excludes the offsetting amount. I report the results in column (2) and (3). Using the seemingly unrelated regression model, I find that the coefficient on $Leverage_{net}$ is insignificantly different from the coefficient on $Leverage_{gross}$ (p-value= 0.63), suggesting that including the offsetting amount on the balance sheet in calculating leverage does not improve the association between leverage and CDS spreads.[17]

I conduct several robustness tests and report the results in Table 6. First, because some control variables are not applicable for non-bank financial firms (e.g., non-performing loans), I include only firm-year observations of bank holding companies and report the results in column (1). I further control for a firm's securitization activities by including *Securitized Assets* and

[16] The results are consistent with the findings of Blankespoor et al. (2013) and Hoenig (2013).
[17] There are two possible explanations for the results that offsetting financial instruments are priced separately but do not significantly increase the association between leverage and a firm's CDS spreads. First, offsetting financial instruments on average are still economically small compared with a firm's total assets and liabilities. Second, the leverage comparison test assumes that CDS investors price offsetting financial instruments in a similar way as they price other financial instruments while this may not be the case.

Retained Interest in column (2). *Securitized Assets* denotes the total securitized assets sold to SPEs and *Retained Interest* denotes securitized assets retained on the balance sheets. I collect these two variables from bank holding companies' Y-9C reports. I find that the coefficients on *Offsetting* are similar across two columns and both are slightly smaller than those reported in Table 5. Second, publicly traded firms may be different from non-publicly traded firms (e.g., Caterpillar Financial Services Corporation), so I only include publicly traded firms in column (3). I further control for stock return volatility in column (4). *Return Volatility* is calculated as the standard deviation of daily stock returns in the current month. I find that the results are slightly weaker in column (3) and (4) than the results in Table 5. The comparison of column (3) and (4) suggests that the weaker results are not likely driven by the inclusion of *Return Volatility* but by the exclusion of non-publicly traded firms. Overall, I find similar results in all robustness tests.

5.4.2. Are Offsetting Financial Instruments More Risk Relevant for Opaque Firms?

Next, I examine whether the risk relevance of offsetting financial instruments is higher for firms with higher asset opacity. Morgan (2002) suggests that rating disagreements capture firm opacity and more opaque assets lead to higher rating disagreements. I construct two alternative proxies for opacity: 1) whether the firm holds different ratings from Moody's and Standard & Poor's; 2) whether the rating difference among Moody's, Standard & Poor's, and Fitch (*Rating Disagreement*) is above the median. Table 7 reports the results. I find that the coefficients on offsetting financial instruments are higher for firms with higher rating disagreements than firms with lower rating disagreements. I compare the coefficients on *Offsetting* between two subgroups in each pair using the seemingly unrelated regression model. I find that the difference in the coefficients on *Offsetting* is statistically significant for the two subgroups partitioned by the rating disagreement from all three rating agencies ($p = 0.00$), but

not significant for the two subgroups partitioned by whether Moody's agrees with Standard & Poor's (p = 0.17).

5.4.3. Does the Risk Relevance of Offsetting Financial Instruments Vary Over Time?

In addition, I examine whether investors price offsetting financial instruments differently across periods. On one side, I expect that the offsetting financial instruments on average could be more risk relevant in the early period (i.e., 2007-2010) because bank runs are more likely to occur during that time. On the other side, I expect that these instruments could be more priced by investors in the late period (i.e., 2011-2014) if investors were less aware of risks of offsetting financial instruments before the FASB's 2011 exposure draft. As a result, I partition the sample period into the pre-2011 and the post-2011 periods and report the results in Table 8. I find that the coefficient on *Offsetting* is only significantly positive in the post-2011 period. In addition, I find that coefficients on certain control variables vary significantly across two subperiods. For example, the association between non-performing loans and CDS spreads is insignificant in the pre-2011 period but significantly positive in the post-2011 period. These differences may be driven by the economic environment which is more volatile and bearish in the early period.

I further run the regressions on the annual basis and report the results in Table 9. This test helps pinpoint in which year offsetting financial instruments are priced but the tradeoff is that insignificant results might be driven by the lack of statistical power. To mitigate such concern, I only control for firm characteristics that are significantly associated with a firm's credit risk in Table 5. I find that the coefficients on *Offsetting* are significantly positive for two years (2009 and 2010) in the period before 2011. In the period after 2011, the coefficients on *Offsetting* are significantly positive for every year except for 2014. In terms of economic magnitude, the coefficients on *Offsetting* are generally larger in the period of 2011-2014 than of 2007-2010.

Overall, these results suggest that investors do not constantly regard offsetting financial instruments as a risk factor, particularly in the early part of my sample period. A possible explanation is that the legal protection offered by the setoff right masks the potential destabilizing effect of offsetting financial instruments.[18]

5.4.4. Does Recognition versus Disclosure Matter?

Finally, I examine whether recognition versus disclosure affects how investors use the offsetting information in evaluating a firm's credit risk. Addressing this question helps to shed light on the debate on whether gross presentation or net presentation should be used on the balance sheet. My empirical approach is to compare firms that voluntarily select net presentation under the U.S. GAAP (i.e., the "Net" sample) with firms that likely would have selected net presentation but are required by IFRS to use gross presentation (the "Gross" sample).

The "Net" sample includes all firms that select net presentation in my full sample. Note that this sample also includes three foreign financial firms. They are able to use net presentation because they file a Form 20-F under U.S. GAAP instead of IFRS. Relying on the results in Table 3, in which I find that firms with more offsetting financial instruments are more likely to select net presentation, I construct the "Gross" sample to include foreign firms whose average offsetting-total assets ratio (*Offsetting*) is greater than the median. Panel A in Table 10 reports the details of the sample construction. My "Net" ("Gross") sample includes 38 (37) firms. The mean of *Offsetting* in the "Gross" sample (0.18) is close to the mean of *Offsetting* in the "Net" sample (0.19), and the *t*-tests show that their difference is statistically insignificant ($p = 0.24$).

Panel B in Table 10 reports the regression results. The regression model for the "Net" sample is the same as the model I used in the previous sections except that I also include clause

[18] An alternative explanation of the results is that CDS investors overreacted to the FASB's proposal and thus overpriced the risk of offsetting financial instruments afterwards. Although I cannot rule out this possibility, it seems not very likely.

fixed effects. The reason is that not all foreign firms included in this sample have a CDS with the Modified Restructuring clauses. Instead, all of them have a CDS with the Full Restructuring clause.[19] The regression model for the "Gross" sample includes not only all the control variables used for the "Net" sample but also exchange rates, country fixed effects, clause fixed effects, and currency fixed effects. I include the exchange rate between Euros and U.S. dollars (*Exchange Rate*) because half of the sample is denominated in U.S. dollars and half is in Euros. I find that offsetting financial instruments are positively associated with CDS spreads in both the "Net" sample and the "Gross" sample. The coefficient on *Offsetting* for the "Gross" sample (0.746) is higher than the coefficient on *Offsetting* for the "Net" sample (0.540). However, using the seemingly unrelated regression model, I find that the difference is not statistically significant ($p = 0.51$).

Contradictory to my hypothesis, the empirical results suggest that recognition versus disclosure does not significantly affect how CDS investors use offsetting information in evaluating a firm's credit risk. There are two possible explanations for the difference. First, I focus on the CDS markets where investors are more sophisticated than those in equity markets (e.g., Das et al. 2014), so the information processing costs may not be an important factor that causes investors to treat recognized and disclosed information differently. This also leads to a caveat that the inference in this paper may not necessarily generalize to other markets such as equity markets. Second, a firm's accounting quality is also shaped by its country's legal systems and information environments (e.g., Leuz et al. 2003). If the accounting information in financial statements of U.S. firms is generally more reliable than that of non-U.S. firms, it may reduce the gap in reliability caused by recognition and disclosure.

[19] I include the foreign financial firms in the "Net" sample because relative to U.S. firms, these firms should be more comparable to other foreign firms included in the "gross" sample. Nevertheless, my results are robust to excluding these three foreign firms in the "Net" sample.

CHAPTER 6: CONCLUSION

In this dissertation, I examine whether offsetting financial instruments are associated with a firm's credit risk. Addressing this question is important for several reasons. First, understanding the risk of offsetting financial instruments may help regulators restrain the risk taken on by financial firms and improve the overall stability of the financial system. Despite this, there is a scarcity of research on offsetting financial instruments. Ryan (2012) states that while examining whether offsetting financial instruments explains firm risk is "both important and currently salient", he also states that he is not aware of any research on this matter. To my knowledge, this is the first study that empirically examines the relation between offsetting financial instruments and credit risk. Second, the offsetting accounting under current U.S. GAAP is controversial and the focus of the debate is on whether the offsetting financial instruments increase a firm's credit risk. Finally, it represents the single largest difference in balance sheet presentation between U.S. GAAP and IFRS for large financial institutions.

I first quantify the magnitude of offsetting financial instruments. For U.S. firms with eligible offsetting financial instruments, on average, these instruments are 7% of total assets and the percentage is significantly higher for the largest financial firms. Surprisingly, I find that a significant portion of U.S. firms voluntarily use gross presentation and that the only significant predictor of the presentation choices is the offsetting amount of financial instruments.

The main finding of this dissertation is that offsetting financial instruments are positively associated with a firm's credit risk, measured by CDS spreads. In addition, I document that the relation between offsetting financial instruments and credit risk is stronger for firms with higher opacity and after the 2011 FASB exposure draft to tighten the offsetting standards. These

findings support the disclosure requirement mandated by the FASB and provide evidence against the argument by financial regulators that offsetting financial instruments do not affect a firm's credit risk. Finally, I find that recognition versus disclosure does not affect how investors in credit markets price the risk of offsetting financial instruments. A potential policy implication is that the current disclosure requirement may be adequate at least for investors in the debt markets.

APPENDICES

Appendix A: Variable Definitions

Name	Definition	Data Source
CDS Variables		
CDS Spread	Five-year credit default swap spreads (in percentages)	*Markit*
Log (*CDS spread*)	The natural logarithm of *CDS Spread*	*Markit*
ISDA2014	Equals to 1 if the CDS contract is under the 2014 ISDA Credit Derivatives Definitions; 0 otherwise	*Markit*
Recovery Rate	The expected percentage of par value that CDS investors will receive after a credit event	*Markit*
Firm Variables		
Offsetting	The amount of financial instruments that are eligible for offsetting scaled by *Total Assets.* See Appendix B for more details on construction of this variable.	*SEC Fillings /Annual Reports*
Total Assets	Total assets for firms that use net presentation, and total assets minus offsetting amount of financial instruments for firms that use gross presentation	*Bloomberg*
Total Liabilities	Total liabilities for firms that use net presentation, and total liabilities minus offsetting amount of financial instruments for firms that use gross presentation	*Bloomberg*
Net Position	The difference between net financial instrument assets and net financial instrument liabilities after offsetting, scaled by *Total Assets*	*SEC Fillings /Annual Reports*
Log (*Total Assets*)	The natural logarithm of *Total Assets*	*Bloomberg*
Leverage $_{net}$	*Total Liabilities* divided by shareholders' equity	*Bloomberg*
Leverage $_{gross}$	(*Total Liabilities* plus *Offsetting*) divided by shareholders' equity	*Bloomberg*
Leverage_High	Equals 1 if the firm's average *Leverage* $_{net}$ during the sample period is above the median in the firm's industry segment.	*Bloomberg*

Appendix A — *Continued*

Name	Definition	Data Source
Return on Assets	Net income divided by *Total Assets*	*Bloomberg*
Cash	Cash and cash equivalents divided by *Total Assets*	*Bloomberg*
Loans	Total loans divided by *Total Assets*	*Bloomberg*
Non-Performing Loans	Nonaccrual loans divided by *Total Assets*	*Bloomberg*
Deposits	Total deposits divided by *Total Liabilities*	*Bloomberg*
Tier 1 Capital Ratio	Tier 1 risk-based capital ratio. The median ratio in the sample is assigned when the value is missing	*Bloomberg*
Tier 1 Miss	Equals 1 if *Tier 1 Capital Ratio* is missing, 0 otherwise	*Bloomberg*
Securitized Assets	Total off-balance sheet securitized assets divided by *Total Assets*	*FR Y-9C*
Retained Interest	Retained interest in securitization divided by *Total Assets*	*FR Y-9C*
Rating disagreement	The average absolute difference between firm ratings received from Moody's, S&P and Fitch. The variable equals to the rating difference between Moody's and S&P if the firm does not receive ratings from Fitch. Ratings scales are translated to numerical scores (AAA=1; AA+=2, AA=3, etc.)	*Bloomberg*
Industry and Macroeconomics Variables		
Commercial Banks	Firms whose first two-digit SIC code is 60	*Bloomberg*
Credit Institutions	Firms whose first two-digit SIC code is 61	*Bloomberg*
Investment Banks	Firms whose first two-digit SIC code is 62.	*Bloomberg*
Insurance Companies	Firms whose first two-digit SIC code is 63 or 64.	*Bloomberg*
Exchange Rate	The monthly-end translation rate between Euros and U.S. dollars	*Federal Reserve*

Appendix B: An Example of Offsetting Financial Instruments

In this appendix, I use a simplified example to illustrate how a firm offsets assets and liabilities. Assume Firm A's total assets consist of Asset_B owed by Counterparty B ($100), Asset_C owed by Counterparty C ($200), and other assets ($900). And Firm A's total liabilities consist of Debt_B owed to Counterparty B ($150), Debt_C owed to Counterparty C ($120), and other liabilities ($800). Firm A's stockholders' equity is $130. For the sake of simplicity, I assume the firm does not post or receive any collateral.

If Firm A presents financial instruments on the *gross* basis, its balance sheet appears as follows:

Assets		Liabilities	
Asset_B	$100	Debt_B	$150
Asset_C	$200	Debt_C	$120
		Other Liabilities	$800
Other Assets	$900	Stockholders' Equity	$130
Total Assets	$1,200	Total Liabilities and Stockholders' Equity	$1,200

If Firm A uses net presentation, it offsets assets and liabilities in the following way:

Counterparty	Gross Assets	Offsetting Amount*	Net Assets
B	$100	$100	$0
C	$200	$120	$80
Total	$300	$220	$80

Counterparty	Gross Liabilities	Offsetting Amount	Net Liabilities
B	$150	$100	$50
C	$120	$120	$0
Total	$270	$220	$50

Offsetting Amount equals to the minimum of assets and liabilities by counterparty

Accordingly, Firm A's balance sheet under *net* presentation appears as follows:

Assets		Liabilities	
Net Assets	$80	Net Debt	$50
		Other Liabilities	$800
Other Assets	$900	Stockholders' Equity	$130
Total Assets	$980	Total Liabilities and Stockholders' Equity	$980

I construct *Offsetting* as the ratio of the offsetting amount of financial instruments to total assets. I exclude the offsetting amount from total assets to make firm size comparable between firms that use net presentation and firms that use the gross presentation. In this example,

Offsetting = $220/ $980 = 22%.

Appendix C: U.S. Sample

The appendix reports the list of U.S. financial institutions that disclose their offsetting financial instruments in their 10-K/Q filings during the period of 2007 to 2014. I group firms into four industry categories and sort them in descending order based on their total assets. * denotes firms with CDS spread available.

Commercial Banks	Comerica	American Express *	FXCM
(*SIC Code: 6000-6099*)	Huntington Bancshares	Ford Motor Credit *	
JP Morgan Chase *	New York Community Bank	Toyota Motor Credit *	***Insurance Companies***
Bank of America *	First Niagara	American Honda Financial *	(*SIC Code: 6300-6499*)
Citigroup *	SVB Financial	CIT Group *	MetLife *
Wells Fargo *	East West Bancorp	Caterpillar Financial Service *	AIG *
Wachovia *	First Horizon National	Deere John Capital *	Prudential Financial *
Washington Mutual *	Firstmerit Corp	IndyMac	Hartford Financial *
U.S. Bancorp *	Susquehanna Bancshares	Nat'l Rural Utilities Coop Finance *	Voya Financial
Capital One *	TCF Financial	PHH Corp *	Principal Financial *
Bank of New York Mellon *	WinTrust Financial	PACCAR	MassMutual *
PNC Financial *	Valley National		Allstate Corp *
Countrywide *	First Midwest Bancorp	***Investment Banks***	Genworth Financial
State Street *	Independent Bank	(*SIC Code: 6200-6299*)	Protective Life
BB&T *	Berkshire Hills Bancorp	Merrill Lynch *	Unum Group *
SunTrust *	Customers Bancorp	Goldman Sachs *	Anthem
National City Corp *		Morgan Stanley *	Great-West Life
Citizens Financial	***Credit Institutions***	Lehman Brothers *	Reins Group of America
Regions Financial *	(*SIC Code: 6100-6199*)	Bear Stearns *	MBIA *
Fifth Third Bancorp *	GE Capital *	Ameriprise Financial	Aon Corp *
Keycorp *	SLM Corp *	Oaktree Capital group	
Northern Trust	Ally Financial *	MF Global	
M&T Bank	Navient Corp *	Jefferies Group	

Appendix D: Non-U.S. Sample

The appendix reports the list of non-U.S. financial institutions that disclose their offsetting financial instruments in their 10-K/Q filings during the period of 2007 to 2014. I group firms into four industry categories and sort them in descending order based on their total assets. * denotes firms with CDS spread available.

Commercial Banks	Standard Chartered *
(*SIC Code: 6000-6099*)	Toronto Dominion Bank *
HSBC *	Australia and New Zealand Bank *
BNP Paribas *	Westpac Banking *
Mitsubishi UFJ Financial *	Bank of Nova Scotia *
Barclays *	China Citic Bank
Bank of China	Danske Bank *
Deutsche Bank *	DZ Bank *
Royal Bank of Scotland *	Bank of Montreal *
Credit Agricole *	Itau Unibanco *
Mizuho Financial	Santander UK Plc *
Societe Generale *	Banco Bradesco *
Sumitomo Mitsui Financial *	Svenska Handelsbanken *
BPCE *	Canadian Imperial Bank *
Lloyds Banking Group *	Skandinaviska Enskilda Banken *
ING Group *	Landbk Baden Wuertbg *
UBS *	BayernLB *
Unicredit *	Bankia
Rabobank *	KBC Bank *
Nordea Bank *	Crédit Industriel et Commercial
Intesa Sanpaolo *	Dexia SA
Royal Bank of Canada *	Shinhan Financial *
National Australia Bank *	Hana Bank
BBVA *	Woori Bank *
Commonwealth Bank Australia *	DNB ASA
Commerzbank *	KB Financial *

Appendix D — *Continued*

Commercial Banks
(*SIC Code: 6000-6099*)
SwedBank AB *
Oversea Chinese Banking Corp *
DBS Group *
Nord/LB *
Abbey Nat'l Treasury Services
Erste Group *
Banca Monte dei Paschi di Siena *
JSC VTB Bank *
Helaba *
United Overseas Bank *
Korea Development Bank *
Deutsche Postbank
Industrial Bank of Korea *
Allied Irish Banks *
Bank Nederlandse Gemeenten
Malayan Banking Bhd *
Raiffeisen Zentralbank *
Bank of Ireland *
National Bank Canada
Banco Popolare Sc *
National Bank of Greece *
Macquarie Bank *
Nederlandse WaterschapsBank
Bank of East Asia *
HDFC Bank *
Grupo Aval Acciones Valores
BanColombia S.A.
Grupo Financiero Santander
Depfa Bank Plc *
Export Import Bank of Korea
Banco de Chile *
Credicorp
Banco Latinoamericano

Credit Institutions
(*SIC Code: 6100-6199*)
Nationwide Building Society *
Hyundai *
Volkswagen Financial Service *
Orix Corp *
Kommuninvest
Eksportfinans ASA

Investment Banks
(*SIC Code: 6200-6299*)
Credit Suisse *
Nomura Holdings *
Mediobanca SPA *

Insurance Companies
(*SIC Code: 6300-6499*)
Prudential Plc *
Aegon NV *
Aviva Plc *
Zurich Insurance *
Standard Life Assurance *
Old Mutual *

Appendix E: An Example of U.S. Firms that Use Gross Presentation.

BB&T

In this appendix, I use BB&T as an example to show that some U.S. firms voluntarily recognize offsetting financial instruments on their balance sheets. In BB&T's 10-k filings of 2013, the company states that "BB&T has master netting agreements with the derivatives dealers with which it does business, but BB&T presents gross assets and liabilities on the Consolidated Balance Sheets" (page 98).

In its Note 18 of derivative financial instruments, BB&T reports as follows (page 138):

December 31, 2013

	Fair Value	
	Asset	Liability
	(Dollars in millions)	
Total derivatives	864	970
Gross amounts not offset in the Consolidated Balance Sheets:		
Amounts subject to master netting arrangements *not offset due to policy election*	(514)	(514)
Cash collateral (received) posted	(44)	(386)
Net amount	306	70

Based on the statement and the table provided above, I code BB&T as a firm that chooses to use gross presentation.

Appendix F

Tables

Table 1. Sample Construction

Panel A and B report the construction of the U.S. sample and the non-U.S. sample, respectively. I start from the largest financial firms because anecdotal evidence suggests that big firms are more likely to have offsetting financial instruments (e.g., Onaran 2013) and they also have large impact to the overall stability of the financial system. Given the effort involved in manually collecting offsetting information, I focus on the top 100 largest financial firms. To increase the sample size for examining risk implications of offsetting financial instruments, I supplement with firms that issue bonds or serve as a CDS reference entity from *FISD* and *Markit*. I define financial firms as firms whose first two digit SIC code is between 60 and 69. I select the top 100 largest financial firms based on their average total assets during the period of 2007 to 2014. Data sources are reported in parentheses.

Panel A. U.S. Sample		
Top 100 largest U.S. financial firms in 2007-2014 (*Compustat*)		100
Financial firms that issued bonds in 2007-2014 (*FISD*)	174	
Financial firms as CDS reference entities in 2007-2014 (*Markit*)	165	
Less: duplicate firms in *FISD*, *Markit*, and *Compustat*	(132)	
Additional financial firms supplemented from *FISD* and *Markit*		207
Less: government-sponsored enterprises and foreign firms' subsidiaries		(8)
Less: firms with no offsetting disclosed in their 10-K/Q filings on EDGAR		(221)
Final U.S. Sample		78
Panel B. Non-U.S. Sample		
Top 100 largest non-U.S. financial firms in 2007-2014 (*Compustat*)		100
Financial Firms as CDS reference entities in 2007-2014 (*Markit*)		651
Less: duplicate firms in *Compustat* and *Markit*		(87)
Less: firms with no offsetting disclosed in their 20-F/40-F filings or annual reports		(566)
Final non-U.S. Sample		98

Table 2. The Magnitude of Offsetting Financial Instruments

This table reports the magnitude of offsetting financial instruments during the period of 2007-2014. For each firm, I calculate *Offsetting* $_{\text{Average}}$ as the average ratio of the offsetting amount to total assets within the sample period. Total assets are adjusted to exclude offsetting financial instruments if the firm uses gross presentation. I calculate *Leverage* $_{\text{Average}}$ as the average ratio of total liabilities to shareholders' equity. The "Net" column presents the average leverage ratio excluding offsetting financial instruments, and the "gross" column presents the average leverage ratio including offsetting financial instruments. Panel A and Panel B report the descriptive statistics of *Offsetting* $_{\text{Average}}$ and *Leverage* $_{\text{Average}}$ for the U.S. sample and the Non-U.S. sample, respectively. In both panels, I partition the sample into two subsamples based on whether the firm is among the top 20 largest firms.

Panel A. U.S. Sample (78 firms)

	Offsetting $_{\text{Average}}$						*Leverage* $_{\text{Average}}$	
Ranked by *Total Assets* $_{\text{Average}}$	Mean	10th	25th	Median	75th	90th	Net	Gross
Top 20 largest firms[1]	22.33%	0.11%	0.72%	5.35%	48.70%	71.66%	13.0	16.5
Non Top-20 firms	1.82%	0.00%	0.04%	0.21%	0.84%	2.76%	10.2	10.5
Total	7.08%	0.01%	0.07%	0.31%	2.08%	30.3%	10.9	12.0

[1] AIG, Bank of America, Bank of New York Mellon, Bear Stearns, Capital One, Citigroup, GE Capital, Goldman Sachs, Hartford Financial, JP Morgan Chase, Lehman Brothers, Merrill Lynch, MetLife, Morgan Stanley, PNC Financial, Prudential Financial, US Bancorp, Wachovia, Washington Mutual, and Wells Fargo.

Panel B. Non-U.S. Sample (98 firms in 30 countries)

	Offsetting $_{\text{Average}}$						*Leverage* $_{\text{Average}}$	
Ranked by *Total Assets* $_{\text{Average}}$	Mean	10th	25th	Median	75th	90th	Net	Gross
Top 20 largest firms[2]	19.22%	2.82%	6.81%	14.90%	28.74%	47.33%	16.5	20.2
Non Top-20 firms	6.31%	0.15%	1.11%	3.31%	6.90%	10.32%	17.4	18.7
Total	8.95%	0.27%	1.29%	4.34%	8.47%	21.20%	17.2	19.0

[2] Bank of China, Barclays, BNP Paribas, BPCE, Credit Agricole, Credit Suisse, Deutsche Bank, HSBC, ING, Intesa Sanpaolo, Lloyds Bank, Mitsubishi UFJ, Mizuho Financial, Nordea Bank, Rabobank, RBS, Societe Generale, Sumitomo Mitsui, UBS, and UniCredit.

Table 3. Which U.S. Firms Select Net Presentation for Financial Instruments

Panel A reports the number of U.S. firms that use net presentation ("net" firms) and U.S. firms that use the gross presentation ("gross" firms) and their average magnitude of offsetting financial instruments (*Offsetting* $_{\text{Average}}$) during the period of 2007-2014. Panel B reports the results of regressing the presentation choices on firm characteristics using the probit model. The dependent variable *Net* is the binary variable that equals to 1 if the firm selects net presentation, 0 if the firm selects the gross presentation. Because firms rarely change their presentation choices over time, I conduct the analyses on a cross-sectional basis with the *average* values of independent variables during the sample period. I report the marginal effects with *z*-statistics in parentheses. Standard errors are clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%. Industry fixed effects (*Commercial Banks, Investment Banks, Credit Institutions*) are included but not tabulated. See variable definitions in Appendix A.

Panel A. Descriptive Statistics

	"Net" Firms		"Gross" Firms	
	No.	*Offsetting* $_{\text{Average}}$	No.	*Offsetting* $_{\text{Average}}$
Commercial Banks	20	10.95%	16	0.20%
Investment Banks	8	38.98%	2	1.19%
Credit Institutions	9	0.57%	6	0.23%
Insurance Companies	8	0.62%	7	0.23%
Total*	45	12.02%	31	0.27%

* I drop one commercial bank and one insurance company that change their presentation methods during the sample period.

Panel B. Regression Results

DV: *Net*	Marginal Effects	Marginal Effects
Offsetting $_{\text{Average}}$	25.09***	36.44***
	(2.57)	(2.94)
Offsetting $_{\text{Average}}$ × *Leverage_High*		-11.92
		(-1.22)
Leverage_High		-0.14
		(-1.05)
Log (*Total Assets*) $_{\text{Average}}$	0.05	0.06
	(1.40)	(1.47)
Leverage $_{\text{net, Average}}$	-0.01	0.00
	(-0.65)	(0.46)
Return on Assets $_{\text{Average}}$	0.02	-3.95
	(0.00)	(-0.21)
Cash $_{\text{Average}}$	0.81	0.66
	(1.38)	(0.76)
Industry Fixed Effects	✓	✓
N	76	76
pseudo R^2	0.34	0.37

Table 4. Descriptive Statistics

This table reports descriptive statistics for variables used in predicting CDS spreads as a function of offsetting financial instruments and other firm characteristics. Panel A and Panel B report descriptive statistics for the U.S. sample and the Non-U.S. sample, respectively. See variable definitions in Appendix A.

Panel A. U.S. Sample (47 firms, 757 firm-quarters, 2,257 CDS-months from 2007-2014)						
Firm Characteristics	No.	Mean	Std. Dev.	25th	50th	75th
Offsetting (%)	757	15.95	31.63	0.27	1.02	9.88
Net Position (%)	757	1.18	5.82	-0.25	0.21	1.03
Total Assets (in $billions)	757	580.3	664.2	124.3	266.4	831.4
Leverage $_{net}$	757	10.8	6.9	6.8	8.8	11.9
Leverage $_{gross}$	757	12.8	8.9	6.9	9.6	16.3
Return on Assets (%)	757	0.17	0.67	0.09	0.22	0.34
Cash (%)	757	4.20	5.11	1.28	2.28	4.85
Loans (%)	757	32.37	28.06	6.49	29.64	59.05
Non-Performing Loans (%)	757	0.46	0.68	0.00	0.09	0.71
Deposits (%)	757	34.10	32.34	0.00	28.96	69.98
Tier 1 Capital Ratio (%)	757	12.27	1.95	11.93	12.16	12.40
Tier 1 Miss	757	0.44	0.50	0.00	0.00	1.00
Securitized Assets (%)	421	9.15	16.32	0.08	0.83	11.38
Retained Interest (%)	421	0.22	0.87	0.00	0.00	0.03
CDS Variables						
CDS Spread	2,257	2.05	3.28	0.73	1.15	2.14
Log (*CDS Spread*)	2,257	0.25	0.89	-0.31	0.14	0.76
ISDA2014	2,257	0.11	0.31	0	0	0
Recovery Rate (%)	2,257	40.15	3.62	40	40	40

Table 4 — *Continued*

Panel B. Non-U.S. Sample (77 firms, 208 firm-years, 2,222 CDS-months from 2007-2014)						
Firm Characteristics	No.	Mean	Std. Dev.	25th	50th	75th
Offsetting (%)	208	13.68	20.73	2.29	6.11	13.55
Net Position (%)	208	0.15	2.46	-0.43	0.03	0.85
Total Assets (in $billions)	208	666.6	569.5	261.3	438.9	892.5
Leverage $_{net}$	208	15.8	6.1	12.1	15.1	18.9
Return on Assets (%)	208	0.06	0.59	0.02	0.12	0.23
Cash (%)	208	4.47	3.60	1.39	4.05	6.57
Loans (%)	208	48.84	20.51	38.73	52.31	63.14
Non-Performing Loans (%)	208	2.45	4.50	0.31	0.85	2.15
Deposits (%)	208	47.83	24.82	31.17	48.63	69.24
Tier 1 Capital Ratio (%)	208	13.47	3.87	11.60	12.90	14.50
Tier 1 Miss	208	0.10	0.30	0.00	0.00	0.00
CDS Variable						
CDS Spread	2,222	1.28	1.35	0.67	0.94	1.4
Log (*CDS Spread*)	2,222	0.02	0.6	-0.41	-0.06	0.34
ISDA2014	2,222	0.09	0.28	0	0	0
Recovery Rate (%)	2,222	39.57	2.54	40	40	40
Exchange Rate (%)	2,222	1.14	0.16	1	1.07	1.34

Table 5. Do Investors Price the Risk of Offsetting Financial Instruments?

The table presents the results of regressing *Log* (*CDS Spread*) on offsetting financial instruments (*Offsetting*) and other firm characteristics. Year and industry fixed effects are also included but not tabulated. Column (1) reports the results using the sample of 47 U.S. financial firms during the period of 2007-2014. Column (2) and column (3) report the results using the leverage ratio that excludes offsetting amount (*Leverage* $_{net}$) and the leverage ratio that includes offsetting amount (*Leverage* $_{gross}$), respectively. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

Log (*CDS Spread*)	(1)	(2)	(3)
Offsetting	0.601**		
	(2.31)		
Leverage $_{net}$	0.026*	0.024	
	(1.79)	(1.66)	
Leverage $_{gross}$			0.021*
			(1.73)
Net Position	-3.409**	-2.726	-2.996*
	(-2.20)	(-1.66)	(-1.94)
Log (*Total Assets*)	-0.207**	-0.185*	-0.188*
	(-2.03)	(-1.86)	(-1.88)
Return on Assets	-12.50	-13.24	-12.63
	(-1.29)	(-1.38)	(-1.31)
Cash	0.044	0.092	-0.006
	(0.03)	(0.07)	(-0.00)
Loans	0.150	0.166	0.222
	(0.26)	(0.28)	(0.39)
Non-Performing Loans	19.97*	17.36	17.21
	(1.72)	(1.52)	(1.52)
Deposits	-0.581	-1.310	-1.072
	(-0.73)	(-1.62)	(-1.30)
Tier 1 Capital Ratio	0.061*	0.066**	0.069**
	(2.00)	(2.17)	(2.31)
Tier 1 Miss	-0.196	-0.343	-0.296
	(-0.73)	(-1.23)	(-1.10)
Recovery Rate	-0.007	-0.007	-0.009
	(-0.54)	(-0.52)	(-0.65)
ISDA2014	0.025	0.017	0.020
	(0.65)	(0.39)	(0.48)
Constant	0.985	1.104	1.047
	(0.53)	(0.60)	(0.57)
N	2,257	2,257	2,257
adj. R^2	0.45	0.44	0.44

Table 6. Robustness Tests

The table presents the results of regressing *Log* (*CDS Spread*) on offsetting financial instruments (*Offsetting*) and other firm characteristics. Year and industry fixed effects are also included but not tabulated. The sample in column (1) and (2) consists of bank holding companies. The sample in column (3) and (4) consists of publicly traded firms. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

Log (*CDS Spread*)	(1)	(2)	(3)	(4)
Offsetting	0.508**	0.504**	0.500*	0.461*
	(2.30)	(2.25)	(1.95)	(1.89)
Net Position	0.877	1.106	-2.689*	-2.340*
	(0.78)	(1.01)	(-1.90)	(-1.71)
Log (*Total Assets*)	-0.194**	-0.196**	-0.242**	-0.224**
	(-2.46)	(-2.47)	(-2.10)	(-2.21)
Leverage $_{net}$	0.062	0.065	0.024	0.022
	(1.55)	(1.64)	(1.10)	(1.17)
Return on Assets	-12.92	-13.12	-12.99	-6.383
	(-0.68)	(-0.73)	(-1.34)	(-0.86)
Cash	-1.053	-0.872	0.500*	-1.511***
	(-1.44)	(-1.06)	(1.95)	(-2.75)
Loans	0.106	0.265	-2.689*	0.270
	(0.28)	(0.67)	(-1.90)	(0.71)
Non-Performing Loans	35.02***	34.60***	-0.242**	14.39
	(3.93)	(2.88)	(-2.10)	(1.29)
Deposits	-0.639	-0.595	0.024	-1.466***
	(-0.90)	(-0.79)	(1.10)	(-2.97)
Tier 1 Capital Ratio	0.087***	0.100***	-12.99	0.080***
	(2.90)	(3.15)	(-1.34)	(3.52)
Tier 1 Miss	-0.578*	-0.519	0.500*	0.003
	(-1.81)	(-1.51)	(1.95)	(0.01)
Recovery Rate	0.038**	0.041**	-0.020*	-0.015
	(2.07)	(2.17)	(-1.77)	(-1.54)
ISDA2014	0.084*	0.089**	0.058	0.055
	(2.02)	(2.08)	(1.34)	(1.41)
Securitized Assets		0.080		
		(0.24)		
Retained Interest		8.710**		
		(2.36)		
Return Volatility				10.46***
				(5.12)
Constant	-1.438	-1.891	2.494	1.840
	(-0.93)	(-1.16)	(1.55)	(1.25)
N	1,252	1,252	1,803	1,803
adj. R^2	0.48	0.49	0.50	0.57

Table 7. Are Offsetting Financial Instruments More Risk Relevant for Opaque Firms?
The table presents the results of regressing *Log* (*CDS Spread*) on offsetting financial instruments (*Offsetting*) and other firm characteristics. CDS characteristics (i.e., *ISDA2014* and *Recovery Rate*) as well as year and industry fixed effects are also included but not tabulated. The sample includes 47 U.S. financial firms during the period of 2007-2014. In the first two columns, I partition the sample based on whether the firm receives the same rating from Moody's and S&P. In the second two columns I partition the sample based on whether the rating disagreement among three rating agencies for a given firm is above the median. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

			Rating Disagreement	
DV: *Log* (*CDS Spread*)	Moody=SP	Moody≠SP	<=median	> median
Offsetting	0.185	0.784**	0.322*	1.776***
	(0.73)	(2.12)	(1.71)	(4.73)
Net Position	-3.412*	-3.266*	-1.730	-4.255**
	(-1.97)	(-1.81)	(-1.04)	(-2.71)
Log (*Total Assets*)	0.055	-0.289***	-0.146	-0.233*
	(0.46)	(-4.13)	(-1.47)	(-1.94)
Leverage $_{net}$	0.019	0.013	0.036***	-0.014
	(0.97)	(1.23)	(2.81)	(-0.62)
Return on Assets	-16.89*	-6.406	-14.95**	-9.706
	(-1.81)	(-0.61)	(-2.14)	(-0.75)
Cash	-0.371	-1.044	0.454	-1.736
	(-0.22)	(-1.17)	(0.29)	(-0.88)
Loans	0.162	0.618	-0.324	2.423***
	(0.40)	(1.23)	(-0.49)	(4.38)
Non-Performing Loans	23.67*	6.210	33.94**	-24.44
	(1.92)	(0.70)	(2.63)	(-1.68)
Deposits	1.147	-1.392*	0.048	-1.754
	(1.34)	(-1.72)	(0.06)	(-1.57)
Tier 1 Capital Ratio	0.063	0.086**	0.034	0.035
	(1.65)	(2.37)	(0.91)	(0.71)
Tier 1 Miss	-0.380	0.285	-0.400**	0.240
	(-1.66)	(0.93)	(-2.61)	(0.69)
Recovery Rate	-0.029	0.006	-0.018	-0.001
	(-1.03)	(0.40)	(-1.11)	(-0.02)
ISDA2014	-0.015	0.039	-0.013	0.038
	(-0.36)	(0.97)	(-0.21)	(1.49)
Constant	-2.594	1.941	0.420	3.144
	(-1.22)	(1.31)	(0.21)	(1.28)
N	950	1,307	1,409	848
adj. R^2	0.52	0.59	0.51	0.59

Table 8. Does the Risk Relevance of Offsetting Financial Instruments Vary Over Time?
The table presents the results of regressing *Log* (*CDS Spread*) on offsetting financial instruments (*Offsetting*) and other firm characteristics. CDS characteristics (i.e., *ISDA2014* and *Recovery Rate*) as well as year and industry fixed effects are also included but not tabulated. The sample includes 47 U.S. financial firms during the period of 2007-2014. The first column reports the regression results in the pre-2011 period and the second column reports the regression results in the post-2011 period. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

DV: *Log* (*CDS Spread*)	2007-2010	2011-2014
Offsetting	-0.079	1.269***
	(-0.44)	(3.96)
Net Position	-1.869*	-4.832**
	(-1.80)	(-2.06)
Log (*Total Assets*)	-0.204*	-0.286***
	(-1.85)	(-3.11)
Leverage $_{net}$	0.016	0.047***
	(0.97)	(4.04)
Return on Assets	-10.47	-6.243
	(-1.18)	(-0.62)
Cash	1.981	-0.931
	(0.98)	(-0.67)
Loans	1.417*	-1.286**
	(1.97)	(-2.58)
Non-Performing Loans	16.27	32.97**
	(1.19)	(2.07)
Deposits	-3.639***	0.769
	(-4.13)	(1.02)
Tier 1 Capital Ratio	0.099***	-0.053
	(4.07)	(-1.22)
Tier 1 Miss	-0.387**	0.061
	(-2.29)	(0.20)
Recovery Rate	-0.080***	0.063***
	(-3.86)	(4.21)
ISDA2014		0.035
		(1.15)
Constant	4.759***	1.476
	(2.95)	(0.82)
N	881	1,376
adj. R^2	0.53	0.57

Table 9. Annual Tests of the Risk Relevance of Offsetting Financial Instruments

The table presents the results of regressing *Log* (*CDS Spread*) on offsetting financial instruments (*Offsetting*) and other firm characteristics for each year from 2007 to 2014. Because of the small size of annual subsamples, I adopt a parsimonious model and only include firm characteristics that are significantly associated with a firm's credit risk in Table 5. The sample includes 47 U.S. financial firms. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

Year =	All years	2007	2008	2009	2010	2011	2012	2013	2014
Offsetting	0.771***	1.417	0.382	0.650*	1.211**	1.443***	1.397***	1.297**	1.766
	(2.79)	(1.77)	(1.33)	(1.89)	(2.41)	(3.98)	(4.03)	(2.61)	(1.66)
Net Position	-3.561**	0.229	-4.104	-6.843**	-1.753	-3.380	-3.913	-4.811	-6.217
	(-2.21)	(0.21)	(-1.18)	(-2.39)	(-1.30)	(-1.24)	(-1.16)	(-1.14)	(-1.02)
Log (*Total Assets*)	-0.205**	-0.179	-0.099	-0.159	-0.313**	-0.257*	-0.351**	-0.238*	-0.267*
	(-2.05)	(-0.91)	(-0.66)	(-0.96)	(-2.14)	(-1.92)	(-2.51)	(-1.91)	(-1.91)
Leverage $_{net}$	0.029**	0.051**	0.006	0.041**	0.041***	0.035***	0.045***	0.035	0.015
	(2.39)	(2.35)	(0.25)	(2.42)	(4.18)	(3.11)	(4.52)	(1.46)	(0.56)
Non-Performing Loans	21.95**	157.9***	55.31**	25.79*	30.10***	23.32	36.77	37.10	47.77*
	(2.21)	(7.69)	(2.62)	(1.91)	(3.09)	(1.39)	(1.58)	(1.65)	(1.74)
Tier 1 Capital Ratio	0.052*	0.046	0.061	0.108*	0.083	0.024	0.049	0.080	0.008
	(1.93)	(0.50)	(1.60)	(1.96)	(1.60)	(0.58)	(1.13)	(1.69)	(0.11)
Constant	0.353	-0.171	0.572	0.150	2.186	2.545	3.275**	1.280	2.507
	(0.23)	(-0.05)	(0.24)	(0.06)	(1.01)	(1.56)	(2.22)	(0.78)	(1.30)
N	2,257	137	257	244	243	254	267	423	432
adj. R^2	0.443	0.584	0.205	0.392	0.557	0.535	0.569	0.271	0.169

Table 10. Does Recognition versus Disclosure Matter?

Panel A reports the construction process for the "Net" sample and the "Gross" sample. The "Net" sample refers to all the firms that select net presentation under U.S. GAAP. The "Gross" sample refers to firms that likely would have selected net presentation but are required to use gross presentation by IFRS. Panel B reports the results of regressing *Log* (*CDS Spread*) on the offsetting financial instruments (*Offsetting*) and other firm characteristics using the "Net" sample and the "Gross" sample separately. CDS characteristics (i.e., *ISDA2014* and *Recovery Rate*) are also included but not tabulated. See variable definitions in Appendix A. In parentheses are *t*-statistics based on robust standard errors clustered by firm. ***, **, and * indicate the significance level at 1%, 5%, and 10%.

Panel A. Sample Construction	
The "Net" Sample	
No. U.S. firms with CDS spreads available	47
No. U.S. firms that use gross presentation	(12)
No. Non-U.S. firms that use net presentation	3
The number of the "Net" firms	38
Mean. *Offsetting*	0.19
The "Gross" Sample	
No. Non-U.S. firms with CDS spreads available	77
No. Non-U.S. firms that use net presentation	(3)
No. Non-U.S. firms whose $Offsetting_{\text{average}}$ is below the median	(37)
The number of the "Gross" firms	37
Mean. *Offsetting*	0.18

Table 10 — *Continued*

Panel B. Regression Results		
DV: *Log* (*CDS Spread*)	"Net" Sample	"Gross" Sample
Offsetting	0.540**	0.746***
	(2.05)	(4.22)
Net Position	-3.009**	-0.857
	(-2.18)	(-0.61)
Log (*Total Assets*)	-0.222**	0.005
	(-2.12)	(0.83)
Leverage $_{net}$	0.023	-0.257***
	(1.54)	(-4.21)
Return on Assets	-10.043	-2.665
	(-1.13)	(-0.38)
Cash	0.668	0.576
	(0.53)	(0.92)
Loans	0.595	-0.099
	(0.92)	(-0.34)
Non-Performing Loans	13.958	2.950**
	(1.08)	(2.67)
Deposits	-1.569*	-0.147
	(-1.92)	(-0.66)
Tier 1 Capital Ratio	0.087***	-0.018*
	(3.50)	(-1.90)
Tier 1 Miss	0.025	
	(0.10)	
Recovery Rate	-0.019	-0.041***
	(-1.50)	(-8.48)
ISDA2014	0.015	0.333**
	(0.27)	(2.22)
Exchange Rate		0.015
		(0.07)
Constant	0.829	3.984***
	(0.50)	(5.27)
Year Fixed Effects	✓	✓
Industry Fixed Effects	✓	✓
Country Fixed Effects	✗	✓
Clause Fixed Effects	✓	✓
Currency Fixed Effects	✗	✓
N	2,026	1,299
adj. R^2	0.51	0.85

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