ISDA® Safe, Efficient Markets

August 2011

Counterparty Credit Risk Management in the US Over-the-Counter (OTC) Derivatives Markets

Summary

In this short paper, ISDA examines the extent of counterparty credit losses and the efficacy of credit mitigation techniques in the US banking system with respect to OTC derivatives. ISDA drew upon data from the Office of the Controller of the Currency Quarterly Report on Bank Trading and Derivatives Activities First Quarter 2011 (the OCC Report) for information regarding US banks. ISDA also examined SEC reports filed by the parents of two non-bank entities active in structuring CDOs of sub-prime mortgages where significant losses are known to have occurred due to monoline insurance company exposure. ISDA intends to do a more exhaustive paper in the near future on industry losses on sub-prime mortgages insured in derivative form by monoline insurance companies.

Our findings are summarized as follows:

- The OCC Report shows very limited counterparty credit losses at the bank level. Since 2007, losses on OTC derivatives positions in the US banking system due to counterparty defaults have totaled less than $2.7 billion, a period that includes the failures of over 350 banks with assets of more than $600 billion, as well as the failures of firms such as Lehman Brothers, Fannie Mae and Freddie Mac.

- Netting plays a major role in reducing counterparty credit risk. After netting, the Net Current Credit Exposure (NCCE) of the US banking system is only 14 basis points, or 0.14%, of the $244 trillion of the gross notional outstanding held at US banks.

- Collateralization further reduces US banks' NCCE to $107 billion; a mere 4 basis points, or 0.04%, of gross notionals.

- The Dodd-Frank Act (DFA) will have very little effect on reducing NCCE. In fact, ISDA believes there may only be $30 billion of uncollateralized exposure that US banks have to counterparties that may be subject to DFA's requirements.

- The analysis of SEC reports indicates counterparty credit losses by non-bank financial entities relating to sub-prime mortgages and monolines dwarf the losses on plain vanilla OTC derivatives. ISDA estimates that monoline derivatives losses for two very active market participants involved in sub-prime CDO activity may have been as much as $21 billion since 2007. These contracts would not be covered by DFA requirements.

- Credit losses were positively affected by actions of the Fed with respect to AIG, which prevented increased losses across several of their lines of business, including mortgage derivatives products and, potentially, cascading defaults from other counterparties not involved with mortgage derivatives.

Introduction

ISDA has worked throughout its 26-year history to make the OTC derivatives marketplace safe and efficient. One of the primary means of doing so has been the introduction of the ISDA Master Agreement, which enables market participants to document transactions with certainty and according to a standardized form. The ISDA Master Agreement also provides for counterparties the ability to net multiple exposures to one another, thereby reducing credit risk. ISDA has been working globally to ensure that netting is legally enforceable, as evidenced by netting legislation in 38 jurisdictions and the 55 legal opinions the Association has procured. ISDA has also been actively involved in the industry's efforts to collateralize exposures arising out of transactions with active users of derivatives.

This note, to a very large extent, will examine how well these risk reduction measures worked in the United States banking system during the crisis and how they continue to work today. As noted, our initial point of reference will be the OCC Report. We will then examine the monoline insurance company credit loss experience of two firms that had non-bank subsidiaries very active in sub-prime CDO structuring.

OCC Report

The OCC Report is prepared with an approximate three months lag each quarter. It provides very useful data with respect to credit risk and credit losses for the entire US commercial banking system. The OCC Report contains historical data from as long ago as 1996. The information contained in the OCC Report ranges from the growth of derivatives by type of product and asset class to calculations of credit exposure relative to risk-based capital. Of particular relevance to this analysis is the data contained in Graph A (Quarterly Charge-Offs from Derivatives since 2007) and in Graph B (Netting Benefit), included at the end of this paper. We also draw on useful information from the Credit Risk section in the OCC Report.

The information contained in the OCC Report is taken from the call reports from the banks. These reports differ in many ways from GAAP reports the banks prepare for financial reporting purposes. Banks may interpret call report instructions in different ways and, as a result, report activities or identify clients in a manner that is not consistently applied across the entire universe of reporting banks. Nonetheless, the call reports are relied upon by regulators and represent the best source of data for much of what we analyze in this paper.

Institutions Covered

A large majority of the tables, graphs and analysis in the OCC Report cover commercial banks only and do not include the non-bank subsidiaries of bank holding companies. So, for example, if a bank holding company owned a non-bank broker dealer that had credit losses in its OTC derivatives operations, such losses would not be included in the OCC Report. Similarly, if an investment bank became a bank holding company during the crisis, derivatives credit losses would not be included unless the derivatives positions were moved to the bank holding company's bank subsidiary. This means that the OCC Report does not include activities of a very small number of swap dealers in the US. However, ISDA believes the Report does provide means to extrapolate losses on plain vanilla derivatives among that group of dealers.

OTC Derivatives Credit Losses: Banks

The table in Graph A (at the end of the paper) shows in graphic and tabular form the losses from charge-offs by banks since 1998 related to their OTC derivatives exposures. Table 1 below shows the losses since 2007. The table shows that losses have been modest during that period, even with the Lehman default period in 2008. Losses since 2007 totaled less than $2.7 billion, including $847 million (or nearly one-third of the losses over the four-year period) in the fourth quarter of 2008, when losses related to the Lehman default were most likely realized. ISDA believes the inclusion of the small group of US swap dealers not covered by the OCC report (as noted above) would not have a disproportionate effect on the result contained in Table 1 with respect to plain vanilla derivatives losses.

Table 1: Charge-Offs ($ in millions)

	Q1	Q2	Q3	Q4	Total
2007	2.9	(9.2)	(119.4)	(30.7)	(156.4)
2008	(14.8)	(120.0)	(91.9)	(846.7)	(1,073.4)
2009	(218.1)	(166.3)	(213.9)	(159.3)	(757.6)
2010	(103.5)	(118.6)	(284.5)	(111.0)	(617.6)
2011	(74.3)				(74.3)
Total					**(2,679.3)**

Based on this data, it would appear the US banking system managed very well through the crisis with respect to the counterparty credit risk in its OTC derivatives businesses. During 2011, losses have declined, with charge-offs in the first quarter amounting to $74.3 million. Remarkably, the OCC Report also notes that only $42 million (at fair market value) of OTC derivatives were 30 days or more past due in the entire US banking system at the end of the first quarter of 2011.

It should be emphasized that Table 1 reports the losses created by counterparty default, not the mark-to-market or trading book losses taken in trading OTC derivatives or in writing credit default swap protection on reference entities that subsequently went bankrupt. Trading losses may or may not have been realized and most likely added to the uncertainty and volatility of markets during the financial crisis. These types of losses, if not realized, would be reversed when and if markets recover.

Table 1 does include credit losses that may have been initially provided for through credit valuation adjustments (CVA) to trading income. As an example, assume that a bank had exposure of $100 million to a weak counterparty. Accounting rules require banks to mark the exposure to market by valuing the derivatives cash flows not at LIBOR but at a rate that reflects the counterparty's credit spread. This might have reduced the valuation of the derivative receivable by $10 million. Suppose in the following quarter the counterparty defaults and the bank is only able to recover $75 million from the counterparty. The loss as reported in Table 1 would be $25 million even though $10 million would have been taken through a CVA charge in the earlier period.

Credit Risk Management

How has the US banking system performed with respect to counterparty risk management? The previous sections indicate that the losses from charge-offs of OTC derivatives exposures due to counterparty defaults have been very manageable for the banks.

This section examines the exposures that exist in bank portfolios and assesses the effectiveness of netting and collateral arrangements. In this regard, it is important to understand that, in managing counterparty risk, banks rely first on the ability to net OTC derivatives exposures (as well as certain other exposures), under the ISDA Master Agreements they have in place with their counterparties. So, if a bank dealer has interest rate derivatives contracts with an investor that are in the money, or positive (i.e., they have created exposure for the bank dealer) the dealer can net these exposures against other contracts with the investor that are out of the money, or negative. These other exposures might arise from equity or credit derivatives or perhaps from other transactions conducted under the ISDA Master.

In addition to netting of exposures, the bank dealer also reduces its credit risk exposure by charging collateral to many of its counterparties for derivative transactions. This collateral might include initial margin, called Independent Amount in the ISDA definitions, as well as variation margin. In the case of the latter, variation margin is charged on the net exposure.

Collateral is typically required from financial institutions and hedge funds. Certain counterparties, such as monoline insurance companies and sovereigns, are reluctant or unable to post collateral, while for other counterparties, usually corporations, writing derivatives is viewed to be part of the dealer's credit relationship with its client. Furthermore, many dealers write derivative contracts in connection with loans to corporate customers. Certain of these loans may be secured by real estate or other less liquid collateral and credit exposure arising from the derivative is also secured by this collateral. The OCC Report does not consider these derivatives to be covered by collateral as it only considers liquid collateral, mostly cash and securities, in its presentation of collateralized swaps.

The OCC Report shows that exposures have been reduced through netting by more than 90% (Graph B at end of paper) and that netting benefits were always above 80% during the period beginning in 2007. Table 2 below contains the netting benefits (gross exposure eliminated through bilateral netting) by quarter since 2007.

Table 2: Netting Benefits (%)

	Q1	Q2	Q3	Q4
2007	85.2	86.4	83.9	84.8
2008	85.6	85.3	84.3	88.7
2009	89.0	88.0	89.7	90.2
2010	91.0	91.9	92.1	91.1
2011	90.4	--	--	--

The OCC Report also shows the exposures that remain after netting and indicates how collateralization policies have held up in practice. This is recorded in Table 3. Table 3 shows that Net Current Credit Exposure (NCCE) related to OTC derivatives is only $353 billion for the US banking system. (NCCE is the sum of the net exposures for each counterparty where a bank has actual exposure.) We say "only" in the context of a banking system with approximately $12 trillion of assets. The NCCE amounts to only 14 basis points (0.14%) of the gross notionals outstanding of $244 trillion. Table 3 shows that uncollateralized NCCE is reduced further to $107 billion or a mere 4 basis points (0.04%) of gross notionals. Of the $107 billion, $79 billion is exposure to corporations and another $10 billion is exposure to sovereigns. In all, the $107 billion of uncollateralized exposure represents less than 1% of the U. S. banking industry's assets.

Table 3: Uncollateralized Exposures ($ billions)

Counterparty Type	NCCE	Collateralized	Uncollateralized	(%)
Banks & Securities Firms	208.3	193.7	14.6	7
Monolines	3.5	-	3.5	100
Hedge Funds	7.1	7.1	0.0	0
Sovereigns	10.6	0.5	10.1	95
Corporations & Other	123.4	44.4	79.0	64
Total	**353.0**	**245.7**	**107.2**	**30**

It is possible to make an estimate of the amount of uncollateralized exposure US banks currently have to entities that will be subject to DFA. From Table 3, we select Banks & Securities Firms and Hedge Funds. Together, these entities have created $14.6 billion of exposure. We do not believe we should include Sovereigns because we believe Sovereigns will only execute derivatives with dealers that do not require collateral. That leaves asset managers and insurance companies where the exposure to insurance

companies excludes non-insurance derivatives written primarily by monolines. To estimate uncollateralized exposures to these entities, we found collateral and exposure data in a major dealer's 10K for 2010. Uncollateralized exposure to asset managers and insurance companies amounted to 14% of that bank's total uncollateralized exposure to Corporations & Other. If we then apply 14% to the industry total of $79 billion, we obtain $11.1 billion. To be conservative, we increased the ratio to 20% and obtain $15.8 billion. Together with $14.6 billion to Banks & Securities Firms, that produces a total of $30.4 billion. In other words, DFA will produce approximately $30 billion of additional variation margin once it is fully operative. If we include the very small number of swap dealers not covered by the OCC report, we project the total may rise to perhaps $50 billion.

Non-Bank Exposure

The losses detailed in Table 1 are not consistent with the scale of mortgage losses we all recall from the financial crisis. During that time, mortgage write-offs and charges by financial institutions were in the billions of dollars. Financial reports did not always specify the amount of losses taken in derivative form. This note will attempt to do so for two active mortgage participants.

There were very few entities that wrote protection on mortgage products; either AIG FP or a handful of monoline insurance companies. Due to Fed intervention, there were no counterparty credit losses on AIG FP. There were, however, losses on monoline insurance contracts covering mortgage products. The losses have been so great that several of the monolines have declared bankruptcy or are in run-off and only one monoline is writing new public finance insurance. Certain financial institutions with exposure to monolines specify the extent of exposures and carrying values related to their monoline exposure. ISDA selected the two US based financial institutions with the largest monoline exposure in an attempt to determine the counterparty credit losses that have been realized. We examined the 10Ks for these institutions since 2007. We were not able to piece together the realized losses from these reports, probably because exposures are still being restructured. However, we were able to determine the aggregate Credit Valuation Adjustments that these two firms have taken on monoline exposure since 2007. The aggregate for the two firms was $21 billion through the end of 2010. (Interestingly, the losses on cash mortgage products for these institutions exceeded the losses on synthetic mortgage products by a wide margin.)

The two institutions selected were active creators of sub-prime CDOs that were willing to warehouse super senior risk. As the mortgage market weakened, they sought protection from further market declines by buying protection from monoline insurance companies. However, they were not the only US firms that bought protection from the monolines. Other firms had smaller mortgage businesses that required protection. We believe a relatively small amount of protection was also purchased to cover transactions where the ultimate buyer of the protection did not own the underlying security or cash instrument. We believe losses from monoline insurance companies for these entities did not rise to the size of the losses sustained by the two entities we analyzed but we plan to do more work to quantify the magnitude of total losses associated with monolines. It is interesting to note that proposed rules governing the implementation of the Dodd-Frank Act exclude insurance derivatives from coverage.

AIG FP sold protection on over $60 billion of CDOs on sub-prime mortgages. After AIG was rescued by the Fed, AIG FP posted $22.4 billion of collateral between September 16 and December 31, 2008. Only $1.3 billion went to US banks or their affiliates while $4.5 billion went to US investment banks. Only two US banks received payments in connection with the purchase by Maiden Lane III of a large majority of the toxic CDOs protected by AIG FP. Nonetheless, we believe the failure of AIG to post collateral could have had a direct negative effect on many non-US banks and might have caused cascading defaults in the financial system and ultimately the commercial sector as well.

Conclusion

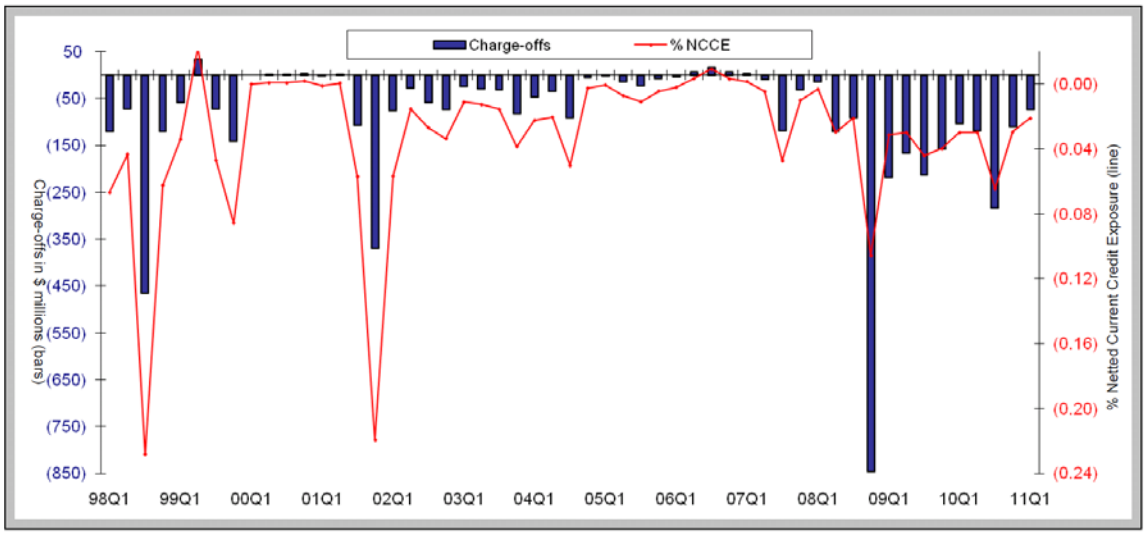
The OCC Report indicates that bank losses on OTC derivatives products due to counterparty defaults were relatively modest throughout the crisis. Most striking is that there is only approximately $30 billion of uncollateralized exposure with entities covered by DFA requirements. Risk management processes such as netting and collateralization worked and continue to work. The banks themselves were not excessively involved with toxic mortgage products in derivative form. ISDA believes the vast majority of OTC derivatives among the banks consists of simple, plain vanilla products.

The OCC Report further confirms that counterparty credit exposures arising from these products can be and, in fact, have been well controlled.

Our short examination of two active participants in the sub-prime CDO market confirms a large majority of counterparty credit losses on derivatives involved mortgages and monoline insurance companies and were incurred outside the banking system. It is apparent that controlling counterparty exposures relating to complex underlying products is more difficult than exposures with more straightforward products.

The AIG rescue prevented losses on over $60 billion of CDOs of sub-prime mortgages from hitting the market. While the US banking system had relatively small exposure to AIG, the exposure among US investment banks and European banks was substantial and their losses might have cascaded and caused considerably more damage to banks and non-banks alike.

Graph A: Quarterly (Charge-Offs)/Recoveries from Derivatives
Commercial Banks with Derivatives, 1998 Q1 - 2011 Q1



98Q1	98Q2	98Q3	98Q4	99Q1	99Q2	99Q3	99Q4	00Q1	00Q2	00Q3	00Q4	01Q1	01Q2	01Q3	01Q4
(121.3)	(72.9)	(466.4)	(121.2)	(58.9)	33.1	(72.1)	(141.0)	0.0	1.0	1.0	3.0	(2.0)	1.0	(107.3)	(370.0)

02Q1	02Q2	02Q3	02Q4	03Q1	03Q2	03Q3	03Q4	04Q1	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3	05Q4
(75.8)	(28.2)	(59.0)	(73.7)	(25.3)	(29.9)	(32.3)	(83.7)	(46.7)	(34.9)	(92.2)	(5.4)	(1.3)	(14.2)	(23.0)	(8.3)

06Q1	06Q2	06Q3	06Q4	07Q1	07Q2	07Q3	07Q4	08Q1	08Q2	08Q3	08Q4	09Q1	09Q2	09Q3	09Q4
(3.6)	7.0	16.0	5.8	2.9	(9.2)	(119.4)	(30.7)	(14.8)	(120.0)	(91.9)	(846.7)	(218.1)	(166.3)	(213.9)	(159.3)

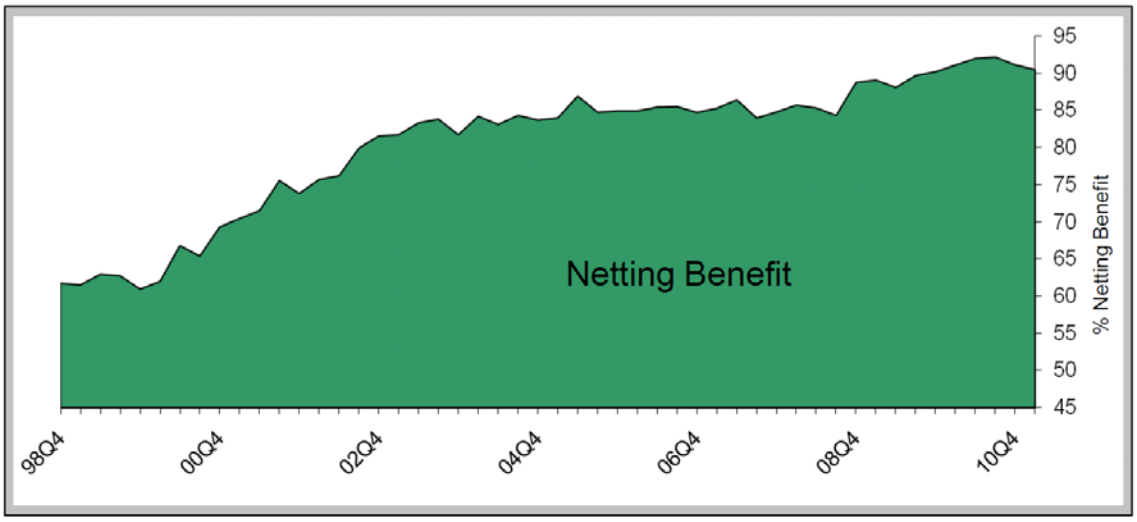
10Q1	10Q2	10Q3	10Q4	**11Q1**
(103.5)	(118.6)	(284.5)	(111.0)	**(74.3)**

Note: The figures are for each quarter alone, not year-to-date.

Data Source: Call Reports.

Source: Office of the Controller of the Currency Quarterly Report on Bank Trading and Derivatives Activities First Quarter 2011

Graph B:
Netting Benefit: Amount of Gross Exposure Eliminated Through Bilateral Netting
All Commercial Banks with Derivatives, 1998 Q1 - 2011 Q1



Netting Benefit (%)*

98Q1	98Q2	98Q3	98Q4	99Q1	99Q2	99Q4	99Q4	00Q1	00Q2	00Q3	00Q4	01Q1	01Q2	01Q3	01Q4
50.6	54.6	58.9	61.7	61.5	62.9	62.7	60.9	66.8	66.8	65.4	69.3	70.4	71.5	75.5	73.8

02Q1	02Q2	02Q3	02Q4	03Q1	03Q2	03Q3	03Q4	04Q1	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3	05Q4
75.7	76.2	79.9	81.5	81.7	83.3	83.8	81.7	84.2	83.1	84.3	83.7	83.9	86.9	84.7	84.9

06Q1	06Q2	06Q3	06Q4	07Q1	07Q2	07Q3	07Q4	08Q1	08Q2	08Q3	08Q4	09Q1	09Q2	09Q3	09Q4
84.9	85.4	85.5	84.7	85.2	86.4	83.9	84.8	85.6	85.3	84.3	88.7	89.0	88.0	89.7	90.2

10Q1	10Q2	10Q3	10Q4	**11Q1**
91.0	91.9	92.1	91.1	**90.4**

*Note: The netting benefit is defined as: $ amount of netting benefits/gross positive fair value.

Data Source: Call Reports

Source: Office of the Controller of the Currency Quarterly Report on Bank Trading and Derivatives Activities First Quarter 2011