ISDA Safe, Efficient Markets

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

A Review of Monoline Exposures

Introduction

This past August, ISDA published a short paper "Counterparty Credit Risk Management in the US Over-the-Counter (OTC) Derivatives Markets." The paper examined the losses incurred in the US banking system due to counterparty defaults on OTC derivatives. It relied on a report issued by the US Office of the Comptroller of the Currency (OCC), which showed such losses amounted to only $2.7 billion from 2007 through the first quarter of 2011. After further investigation, it became apparent that the transactions involving subprime mortgage risk taken in synthetic (i.e. through a derivative contract) form were not booked in US banks but rather in non-bank affiliates of US banks, in international banks and in entities that were not banks when the losses were taken. The ISDA paper identified estimates of losses of as much as $21 billion in two non-bank US entities related to exposure to monoline insurers, primarily on Collateralized Debt Obligations (CDOs) consisting of assets that included subprime mortgages. ISDA noted that it would analyze the extent of losses due to monoline exposure more thoroughly. This paper is the result of that examination.

Summary

ISDA examined SEC filings of 12 US bank holding companies and international banking companies from 2007 to 2010. The purpose was to produce an estimate of the charges taken by banks on their exposures to monoline insurance companies. This insurance was primarily written on the performance of CDOs on residential mortgage backed securities (RMBS) with large components of subprime risk. As we went through our analysis, we found that the monolines had also insured CDOs of CMBS, home equity loans, RMBS in forms other than CDOs, and auction-rate floating rate securities. The banks in our sample generally did not differentiate between types of exposures to monolines and so the losses and exposures contained in this paper will be total losses and exposures rather than being limited to CDOs of RMBS.

Our principal findings are:

- These 12 firms took aggregate CVA Charges (see below) of approximately $54 billion on monoline exposures.

- There remains $18bn in CVA Balances across the 12 selected banks signaling possible recovery or future write-offs.
- Four institutions accounted for a staggering $43 billion of CVA Charges.
- These four institutions alone had Notional Amounts of Insurance from monolines of over $100 billion in 2008, an amount significantly above the total of all CDOs of RMBS guaranteed by AIG FP.
- The banks' CVA Charges reflect the fair market value of the counterparty credit risk they had with the monolines as a result of those transactions. Had there been no such transactions, there would have been no CVA Charges. Losses incurred by the banks, however, would have been even greater if the transactions had not occurred, as the monolines absorbed some of the losses from the cash positions.
- Despite the magnitude of the CVA Charges, the losses of the four institutions on cash mortgages were even greater.
- The counterparty credit losses on the OTC derivatives contained in the OCC report ($2.7 billion) appear insignificant relative to the derivatives losses from monolines and the losses on cash mortgages. It is fair to say that counterparty credit losses on plain vanilla OTC derivatives did not produce significant losses in the US banking system.
- Derivatives written by US insurance companies are not regulated by the Dodd-Frank Act.

A table of charges, stockholders equity and remaining reserves on the 12 firms in our study is provided below.

Table 1: Banks' Monoline-related CVA Charges – 2007-2010

	CVA Charges						CVA Charges	Mortgage
(Amounts in $ billions)	**2007**	**2008**	**2009**	**2010**	**Total**	**2006 Equity**	**/ Equity**	**Losses***
Bank of America Merrill Lynch	$3.3	$11.3	$0.9	$0.0	$15.5	$174.3	8.9%	$56.2
Bank of America	0.2	0.9	0.9	0.0	2.0	135.3	1.5	16.4
Merrill Lynch	3.1	10.4	0.0	0.0	13.5	39.0	34.6	39.8
Barclays	0.0	0.6	0.8	0.0	1.4	72.3	2.0	13.3
Citigroup	1.0	5.7	1.3	(0.5)	7.5	119.8	6.2	42.6
Credit Suisse	(0.0)	0.6	0.1	(0.1)	0.5	35.7	1.5	11.1
Deutsche Bank	0.1	1.8	0.0	0.2	2.1	43.3	4.9	6.9
Goldman Sachs	0.0	0.0	0.0	0.0	0.0	31.0	0.0	4.6
J.P. Morgan	0.0	0.0	0.0	0.0	0.0	115.8	0.0	2.0
Morgan Stanley	0.0	1.9	0.2	0.9	3.0	35.4	8.4	3.2
Royal Bank of Scotland	1.7	6.6	4.0	(0.3)	12.0	103.9	11.6	19.8
Societe General	1.3	1.8	0.6	0.0	3.7	44.0	8.4	11.1
UBS	0.7	7.0	0.7	(0.7)	7.8	40.7	19.1	33.1
Total	**$11.4**	**$48.7**	**$9.5**	**($0.5)**	**$53.6**	**$816.2**	**6.6%**	**$203.9**

* Source: Bloomberg

The following terms are used in this paper:

CDO – Collateralized Debt Obligation – A securitized product consisting of tranches of single debt instruments (loans and/or securities) and/or pools of single debt instruments and tranches of other CDOs

CVA – Credit Valuation Adjustment – A mark to market adjustment made by a creditor to adjust an asset's value based on the creditworthiness of the debtor. It is recorded as a contra-asset and as a loss on the Income Statement

CVA Charge – The Income Statement charge to reflect the loss or gain in the value of a receivable caused by the change in the perception of the obligor's creditworthiness

CVA Balance – Used to denote the aggregate CVA on a company's balance sheet at any point in time

DVA – Debt Valuation Adjustment – A mark to market adjustment made by a debtor against a liability to adjust for the market value of its own creditworthiness. It is recorded as a contra-liability and as a gain on the Income Statement

Market Value – The value of a CDS based on losses on an underlying CDO or MBS. If a CDO decreases in value, the CDS's market value will increase by the same amount

Mezzanine CDO – A CDO consisting of the tranches of multiple pools or CDOs of RMBSs each of which is rated BBB or below

MBS – Mortgage-backed Security – A securitized product backed by pools of commercial (CMBS) or residential (RMBS) mortgages

Notional Amount of Insurance – The amount of an insurance policy and the maximum liability and payout for the policy

Super Senior CDO – That portion of a CDO or asset pool with credit enhancement in excess of the minimum required for a AAA rating

Write-off/Write-down – Used herein to be the reduction of a reserve after a loss is realized. In this paper, it is the amount that the CVA Balance is reduced after a contract is commuted

Approach

1. Selected Banks

ISDA selected a total of 12 firms for analysis. These 12 firms included six US firms: Bank of America, Citigroup, Goldman Sachs, J.P. Morgan, Merrill Lynch and Morgan Stanley. These firms were very active in capital markets in the period leading up to the financial crisis. ISDA also selected six international banks based upon anecdotal evidence that they had suffered large losses through monoline-insured CDOs. These banks are Barclays, Credit Suisse, Deutsche Bank, Royal Bank of Scotland, Societe General, and UBS.

ISDA examined SEC filings for each of these firms from 2007 to 2010 to gather data for the analysis. While filings varied in the extent of disclosure, we found, with few exceptions, specific data about monoline exposure.

2. CVA

During 2007 and 2008, the value of the insurance policies on CDOs that were written in derivative form rose in value to offset the decline in value of insured CDOs. Accounting rules, notably FAS 157, Fair Value Measurements, require firms to adjust the value of receivables by an amount that reflects the credit risk of the obligor. This amount is called the Credit Valuation Adjustment or CVA and the CVA itself is a contra asset. Charges to create the CVA are termed CVA Charges. ISDA determined the total CVA Charges taken by each firm over the four year period from 2007 to 2010. The CVA Charges do not represent realized losses since losses are typically realized only when defaults occur. If the loss is equivalent to the CVA Balance, no additional loss is recognized. If the loss exceeds the CVA Balance, an additional CVA Charge is taken. Finally, if the loss realized is less than the CVA Balance, a negative CVA Charge is taken.

3. CVA Disclosure on Monoline Risk

In the course of our study, we found that some banks provided a full accounting of the Credit Valuation Adjustment account, including CVA Charges, write-offs, and beginning and ending balances.

Several banks provided a balance for the year-end as well as the CVA Charges. From this, the write-downs for the year were derived using the following formula:

Ending Balance = Beginning Balance + CVA Charge taken in P/L + Write Up (Downs)
For a few banks, only a CVA Balance or CVA Charge was disclosed and we were forced to make further assumptions, including:

- In each case, unless specifically reported otherwise, the CVA Balance at the beginning of 2007 was assumed to be $0.
- In 2007, if only the balance was stated at year-end (and no CVA Charges), then the CVA Charges were assumed to be taken in 2007 and write-offs were assumed to be $0.
- In the two cases where banks did not provide figures for CVA Charges (J.P. Morgan and Goldman Sachs), the CVA Charge was assumed to be zero.
- Deutsche Bank only provided CVA Balances for each year. CVA Charges were assumed to be the increase in the CVA Balance for the current year (if present) and the write-offs were assumed to be any decrease in the CVA Balance.
- Morgan Stanley provided CVA Charges but did not provide year-end balances. For 2010, the CVA Balance was assumed to be the CVA Charge for 2010.

In the case of banks with non-USD reporting currencies, adjustments were necessary as part of both the bank's reporting and ISDA's reporting due to the majority of banks' securities being denominated in US Dollars but reporting being done in the local currency. Balances were translated at the spot rate for year-end and gains/losses were translated using an average rate for the year.

ISDA believes the net effects of these assumptions make our results an estimate rather than an exact calculation of the CVA Charges during the four year period. They should be viewed as reasonable approximations. It should also be noted that the 12 banks retained CVA Balances relating to monolines of nearly $18bn as of year-end 2010, indicating the possibility of some recoveries or additional write-offs.

4. Four Largest Losses

ISDA examined four institutions in more detail. These institutions: Bank of America Merrill Lynch, Citigroup, UBS and RBS had the largest CVA Charges. It was felt that a further explanation regarding these losses (and our calculations) would be beneficial.

ISDA also compared the monoline CVA Charges for these firms to their mortgage-related losses as reported by Bloomberg.

Background: Sub Prime Mortgages and the Monolines

1. How it Started

The subprime mortgage boom, which began in 2004, coincided with new developments in structured finance that facilitated the sale of these mortgages in asset-backed form. Since the 1980s, pools of mortgages had been sliced into pieces called tranches and sold to the investing

public. The new developments involved taking the tranches themselves and assembling them into other securities, CDOs. The lion's share of each CDO was turned into one or more "super senior" securities. These securities had far more credit enhancement or protection than what was needed to obtain an AAA rating. These securities were much easier to sell if a very strong financial firm could guarantee principal and interest. In stepped AIG Financial Products. AIG FP was active in the market wrapping super senior CDOs of subprime RMBS through 2005. It then pulled back from the market as it noticed credit standards deteriorating.

The party was not over. Monoline insurance companies rushed into the void left by AIG FP and some banks themselves decided they could safely take the super senior risk. Very importantly, junior tranches of CDOs could be combined into new CDOs (mezzanine CDOs) which contained large tranches of super senior securities (this was the financial world's version of alchemy!) As a result, all that was needed was to find relatively few investors that would take those junior tranches that could not be used for other CDOs as well as a reasonable number that might take BBB, A and AA-rated securities.

The monoline insurance companies were called monoline because traditionally they only had one line of business and that was to insure municipal bonds. For years, virtually all the monolines were rated AAA and this enabled their insured products to trade well in the market. Unfortunately, monolines looked for new asset classes to insure. One of them was CDOs of RMBS and they participated in a huge way. Monolines wrote insurance policies on tens of billions of dollars on CDOs of RMBS. They also wrote insurance on CDOs of CMBS, home equity loans and a variety of other structured finance products. Major monolines included MBIA, AMBAC, FSA, Assured Guaranty, FGIC, SCA (now called Syncora) and CIFG. There was one small monoline, ACA, which was rated A.

Mortgage market conditions began deteriorating in 2007 but CDO activity was very strong until the middle of that year. As conditions worsened, banks rushed to buy protection on super senior securities they held in inventory. Market prices of RMBS and CDOs fell, some in spectacular fashion. The market prices of the underlying securities soon implied that the monolines would be faced with losses well beyond their means to service. The first outright casualty was ACA which announced in the fall of 2007 that its equity would be wiped out. It was forced to enter into a restructuring plan in early 2008.

2. Risk Management Problems

The monolines shared an advantage with AIG FP. Given their credit ratings, they generally resisted collateralizing the market value of their policies. Some had collateral provisions that only became effective after several downgrades were recorded. Once they hit this credit rating,

they would be faced with a tremendously large collateral call, much like the one AIG FP faced in September 2008.

This credit risk management was highly flawed. Dealers needed to have much more sensitive stress testing of risks to ensure exposures to losses were manageable. What was the maximum loss given default? What if house prices declined nation-wide? What happened if the effects of a downgrade created a collateral call that would sink a company rather than give creditors the collateral protection they needed? ISDA believes all reasonably sized financial intermediaries should be subject to variation margining from Day 1. Paradoxically, this policy might still not have prevented the losses that incurred. First, the banks already had the mortgage exposure to start with. Second, once the insurance was written, the monolines were doomed and the banks were stuck with the monoline risk. No one would take the CDO risk from the monolines.

3. Write-Downs, Commutations and Accounting

In 2007 and 2008, as monolines' credit spreads continued to widen and default became more and more of a possibility, the banks were forced to take CVA Charges on the receivables they recorded for the insurance policies. The banks based the CVA associated with these assets on a number of factors including the underlying credit spread of the monoline insurers.

While the financial positions of the monoline insurers continued to deteriorate, banks recorded ever larger CVA Charges. As it became clear that certain insurers would not survive, banks became willing to cancel, or commute, the insurance claims with the monolines for cash or other consideration. Then, based on the CVA Charges that the banks had already taken, additional write-downs or write-ups would be recorded and Notional Amount of Insurance would be reduced by the stated amount of the now cancelled insurance contracts.

The accounting for CVA Charges worked as follows: Suppose a bank had $5bn worth of insured CDOs. Suppose the CDOs themselves were subsequently valued at $3 billion, which made the value of the insurance contracts worth $2 billion. Suppose, however, the bank's best estimate of the value of the contract had to be reduced by three quarters, $1.5 billion, to reflect the credit risk of the monoline. That $1.5 billion would be the CVA Charge and would be written against earnings. The monolines would make opposite entries. The value of the policy created a liability of $2 billion and the adjustment for its own credit would create a contra liability called a Debt Valuation Adjustment or DVA (the insurance company may or may not have arrived at the same value for the CDO or the DVA that had had recorded on the banks' books as each party valued these amounts independently).

Once the insurance policy was commuted, the value of the policy would be eliminated from the bank's balance sheet along with the CVA Balance. Presumably, cash or other consideration was

given to tear up the insurance contract. If consideration equaled $500 million in our example, there would be no P/L effect on the bank. If consideration exceeded $500 million the excess was booked as a gain while any shortfall created a loss.

For the monoline, if the consideration exceeded the net value of its liability, a loss was incurred. If it were less that the carrying value of the liability, a gain could be recorded. Given the accounting rules, it was very possible that both sides could record gains or losses. It was also possible for one party to have a gain and the other a loss.

4. Where are we now?

As a result of the crisis, the majority of monoline insurers have gone out of business. A few are running off portfolios, under the control of banks, insurance regulators or bankruptcy courts. Effectively, only one entity is writing new insurance. The banks have not fully settled with the industry and $18 billion of CVA Balance remains on their balance sheets. The banks are still attempting to recover at least a portion of the CVA Charges that they have taken on the insurance contracts.

The following sections will discuss the scale and timing at the banks which recorded the four largest CVA Charges for monoline insurers.

Case Studies – Introduction

In the following case studies, we will examine the CVA Charges and balances for four banks: Citigroup, UBS, Royal Bank of Scotland, and Bank of America Merrill Lynch.

Each case will contain:

- A synopsis of the bank's CVA Charges;
- A discussion of Notional Amount of Insurance and Market Value of the insurance it carried (if available) and any conclusions that can be drawn;
- The source document and location of the CVA disclosure and a short discussion of the type of detail that the bank disclosed since this tended to vary from bank to bank and even from year to year; and
- A discussion of the remaining CVA Balance as of 2010, along with any notable implications.
- Bloomberg estimates of the bank's mortgage losses to date.

Table 2 below presents additional data for the four institutions: the 2010 CVA Balance, the 2010 Notional Amount of Insurance purchased from monolines, the 2010 Market Value of the Insurance (CDS) and the peak Notional Amount of Insurance for each bank.

Table 2: Select 2010 Monoline CVA Balances, Notional Amounts of Insurance and Market Values

(Amounts in $ billions)	2010 CVA Balance	2010 Notional Amount	2010 Market Value	Peak Notional Amount	
Bank of America Merrill Lynch	$5.3	$38.4	$9.2	$53.1	(2008)
Bank of America	0.3	6.4	0.4	N/A	
Merrill Lynch	5.0	32.0	8.8	53.1	(2008)
Citigroup	3.3	4.4	1.9	20.4	(2007)
Royal Bank of Scotland	3.8	N/A	6.3	16.9	(2008)
UBS	1.2	12.7	2.9	21.3	(2007)
Total	**$17.8**				

Citigroup

Citigroup had cumulative CVA Charges of $7.5 billion on monoline insurance policy receivables.

From 2007 to 2008, Citigroup reduced its total Notional Amount of Insurance from monolines from the peak of $20.4bn to $12.2bn. During 2008, the Market Value of the Direct CDS contracts with FGIC, ACA, and Radian dropped from an aggregate $1.4bn to $0bn, indicating that these insurance contracts specifically were either commuted or written off. It is likely Citigroup did commutations of additional contracts with other monolines in 2008.

From 2007-2010, Citigroup provided aggregate figures with respect to its subprime and prime RMBS. Each year, the company stated the Notional Amount of Insurance, its Market Value and the CVA Balance on its balance sheet. Citigroup's 10-Ks also provided exposure by monoline insurer broken into Direct Assets and Trading Assets. This information may be found in the Managing Global Risk section of its 10-K in 2007 and 2008 and the Derivatives sections in 2009 and 2010.

Citigroup did not provide exposure by monoline in its 2010 10-K, but it was most likely concentrated with AMBAC and MBIA as $6.4bn of the $6.5bn of CVA Balance was with the two monolines at the end of 2009.

Bloomberg estimates Citigroup's mortgage losses at $42.6bn, roughly six times the monoline CVA Charge.

UBS

UBS had cumulative CVA Charges of $7.8 billion on monoline insurance policy receivables. Almost all of this was taken in 2008 when the bank recorded a $7.0bn (7.6bn SFr) CVA Charge for the year.

UBS's peak Notional Amount of Insurance from monolines was $21.3bn at the end of 2007. The insurance covered both U.S. subprime RMBS high grade and other assets. The insurance had a Market Value of $11.5bn in 2008 but was reduced to under $3bn by the end of 2010. In 2009, the Notional Amount of Insurance went from $20.2bn at the end of 2008 to $13.7bn at the end of 2009, a reduction of $6.5bn. Market Value of the insurance contracts was reduced by $6.6bn in 2009 and the bank wrote off $4.6bn from the CVA Balance. This means UBS commuted insurance with a Market Value of $6.6bn for approximately $2.0bn. Since the commutation reduced the Market Value by the same amount as the Notional Amount of Insurance (approximately $6.6bn) then the full Notional Amount of Insurance had been realized and the underlying insured assets had become essentially worthless.

UBS reported the bank's exposure in two categories. The first is subprime RMBS CDO assets and the second is a category that is "Other than US RMBS CDOs". Not surprisingly, the subprime CDO assets had a larger relative CVA than the Other assets UBS reported (63% of Market Value for subprime, 48% for Other in 2008). This suggests that the Other category may have consisted of higher-quality assets but UBS does not provide any more detail other than to say that the assets were CDOs. The Notional Amount of Insurance in the Other category was reduced only slightly ($12.6bn in 2007 to $11.2bn in 2010) and the Market Value of the CDS was reduced to $2.5bn confirming its rate of failure was significantly lower than that for US RMBS CDOs and that very few of these policies were written off or commuted.

UBS reported the bank's exposure to monolines in the Risk Concentration section of its 20-F containing its Annual Report. UBS presented information on its monoline exposure by insurance company rating as well as the type of underlying product (high grade, mezzanine, or other). The report contained the Notional Amount of Insurance, the Market Value of the underlying CDOs, the Market Value of the CDSs, the CVA Balance, and the Market Value of the CDS after deducting the CVA Balance.

UBS has relatively small exposure left to monolines on the lower quality subprime assets. The Notional Amount of Insurance is only $0.8bn and the CVA Balance is $0.4bn. This compares to

a Notional Amount of Insurance of $11.9bn and a CVA Balance of $0.8bn for the Other assets. The Notional Amount of Insurance peaked at $21.3bn in 2007.

Total mortgage-related losses at UBS are estimated at $33.1bn by Bloomberg, roughly five times the monoline CVA Charge.

Royal Bank of Scotland

Royal Bank of Scotland (RBS) had cumulative CVA Charges of $12.0bn on monoline insurance policies. RBS also recorded another $2.9bn in CVA Charges for credit derivative product company (CDPC) receivables.

At its peak, RBS had insurance with a Market Value of $16.9bn from the monolines, $10.1bn of which was written in 2008. During 2009, RBS greatly reduced its exposure by commuting $6.9bn of Market Value of insurance.

RBS discussed the bank's exposure to monoline insurers and CDPCs in the Business Review section of its Annual Report, under Counterparty Valuation Adjustments. The bank provided a full accounting of the CVA Charges and balances, including F/X adjustments and the net benefit of counterparty hedges. No detail on the insurers or the insurers' rating was provided.

As of December 2010, RBS still had a CVA Balance of $3.8bn for monolines and another $0.8bn for CDPCs. Notional Amounts of Insurance were not disclosed. The Market Value of the monoline insurance was $6.3bn and the Market Value of the CDPC insurance was $1.9bn.

RBS had total mortgage-related losses of $19.8bn according to Bloomberg, 65% more than the monoline CVA Charge.

Bank of America Merrill Lynch

The majority of the cumulative CVA Charges on monoline insurance receivables recorded by Bank of America Merrill Lynch were due to monoline business originated in the Merrill Lynch franchise. Of the $15.5bn of CVA Charges, $13.5bn was taken by Merrill Lynch prior to the year-end 2008 merger. Additionally, Bank of America took CVA Charges of about $1.1bn from 2007 to 2008, while the combined entity took $0.9bn of CVA Charges in 2009 and 2010.

Merrill Lynch recorded CVA Charges in both Super Senior CDO portfolios as well as assets other than super senior CDOs ("Other"). Super Senior was responsible for $6.5bn of CVA Charges in 2008 and 2009 while Other had CVA Charges of $7.0bn during that time. Merrill Lynch commuted most of the Super Senior receivables in 2008 and reduced the Notional Amount of

Insurance from $19.9bn to $2.8bn while reducing the Market Value from $6.1bn to $2.4bn. In 2008, Merrill reported it had purchased (presumably in 2007) $50.3 billion of Notional Amount of Insurance in the other category. The market value of this insurance was 12.8 billion at year-end 2008. This included corporate CDOs, CLOs, RMBS and CMBS.

Merrill Lynch (which produced financial statements for all four years) provided detail by counterparty credit rating for the Notional Amount of Insurance, the Market Value of the underlying CDOs, the Market Value of the CDSs, the CVA Balance, and the Net Market Value of the insurance after deducting the CVA Balance. These results were reported in the Consolidated Results of Operations portion of the MD&A section in its 10Ks. Bank of America provided the same information with slightly less detail in its MD&A section.

At the end of 2010, Bank of America Merrill Lynch had a CVA Balance of $5.3bn, $38.4bn of Notional Amount of Insurance and $9.4bn of Market Value.

Total mortgage-related losses to date at both Bank of America and Merrill Lynch are estimated by Bloomberg to be $56.2bn with $39.8bn coming from Merrill Lynch and $16.4bn from Bank of America. This total is nearly four times the total monoline CVA Charge.

Conclusion

The monoline insurance companies had tremendous losses on structured products, much of it on CDOs of RMBS during the financial crisis. The products were insurance policies written in CDS form. Despite being regulated, these companies took so much risk that the industry has virtually ceased to exist. CVA Charges in excess of $50 billion may have been taken on these insurance policies by global banks. These losses were on top of the losses the monolines were able to absorb themselves. ISDA believes these CVA Charges represent a very large majority of global counterparty credit losses taken in derivative form during the crisis (ISDA also believes the CVA Charges would have been much greater if not for the government's assistance to AIG). In fact, ISDA has not found evidence of significant counterparty credit losses anywhere else in the banking system other than the much smaller loss from unwinding positions with Lehman Brothers.

The paper uses Bloomberg estimates to show that as large as the monoline losses were, the banks lost much more money on mortgages directly. Both products were, of course, real-estate related and these findings confirm ISDA's long-held view that real estate risk in one form or another was at the heart of the financial crisis in the US.

Finally, it is ironic that the industry that spawned so much damage is not touched by the Dodd-Frank Act. Derivatives written by insurance companies are, for the most part, not subject to Dodd-Frank. ■