

International Swaps and Derivatives Association, Inc. (ISDA®)

Settlement of Credit Default Swaps: Mechanics, Challenges, and Solutions

Credit Derivative Symposium

Fordham Graduate School of Business

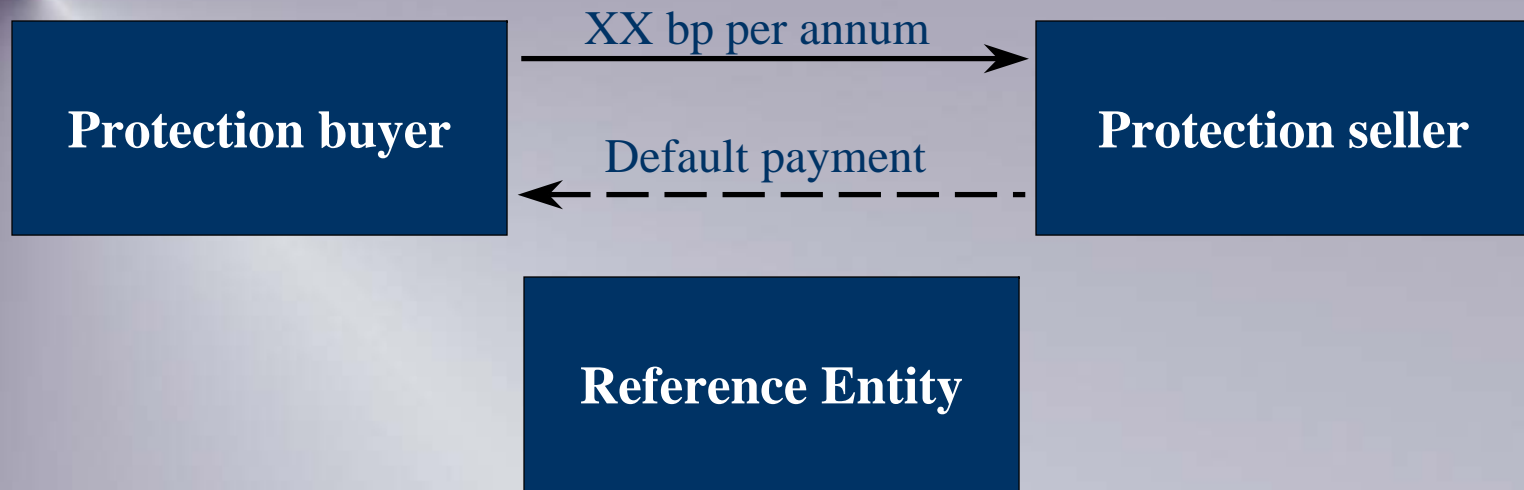
Friday, September 29, 2006

Kimberly A. Summe, General Counsel

David L. Mengle, Head of Research

ISDA

Credit Default Swaps



- Buyer pays premium for protection against default by Reference Entity
- Reference Entity can be a single name (corporate or sovereign), portfolio (synthetic securitization), or diversified index of entities
 - About half of CDS outstanding reference a single name
 - Over half of new CDS reference an index
- If Reference Entity default (or other credit event) occurs, seller compensates buyer with default payment equal to net loss
 - Most common credit events are failure to pay, bankruptcy, and restructuring

CDS Settlement: Compensating Protection Buyer after Default Event

- Physical settlement
 - Protection buyer delivers reference obligation and receives par value from protection seller
 - For bonds or loans, contract must specify which reference obligations can be delivered to satisfy the protection seller's obligation
- Cash settlement
 - Normally, $\text{Payout} = (\text{Par value} - \text{Market value}) \times \text{Notional}$
 - Market value comes from auction or from dealer poll
 - For any Reference Entity, contract must specify which reference obligations could be valued to determine payout

Cash and Physical Settlement Compared

- Sell protection on reference obligation, which is a 5-year, US\$ 10 million corporate bond
- Recovery rate on defaulted bond = 40%

Cash settlement

- Post-default bond value determined at \$4 million
- Protection seller pays difference between par and market value = \$6 million (= \$10 million – \$4 million)
- Result
 - Protection buyer compensated for loss
 - Net loss to protection seller is \$6 million

Physical settlement

- Protection buyer delivers reference obligation to protection seller
- Protection seller pays par value (\$10 million) to buyer
- Result
 - Protection buyer compensated for loss
 - Protection seller receives defaulted loan worth \$4 million, so net loss to protection seller is \$6 million

Cash versus Physical Settlement

- Physical settlement
 - Avoids valuation problems when it is difficult to obtain quotes
 - Liquidity pressure on underlying markets is an increasing problem
 - Was not a problem so long as CDS was primarily on single names
 - Growth of CDS leveraged to indexes has made this an issue
- Cash settlement requires specification of reference obligations to serve as price sources
 - Current documentation requires quotes from dealer poll to determine post-default bond price
 - It is could be difficult to obtain quotes during market disruptions
 - Recent pressures on underlying bonds have led to reliance on auctions instead of market quotes to determine bond price
- ISDA has developed the CDS Index Protocols to allow cash settlement in lieu of physical settlement

CDS Index Protocols

Why did we develop the CDX Index Protocols?

- CDS single-name and index trades generally provide for physical settlement
- Credit events occurred on entities that were included in various diversified CDS indexes.
 - Amount of protection outstanding was generally far greater than supply of underlying deliverable bonds
 - Attempting physical settlement could put substantial liquidity pressure on underlying bond markets.
- The purpose of the Protocol is to offer market participants an efficient way to address the settlement issues relating to trades on credit derivative indices.
 - The Protocol offer institutions the ability to amend documentation for index trades to provide for cash settlement instead of physical settlement.
 - Settlement amount is determined by means of an auction process to determine the final price of the defaulted bonds.

CDS Index Protocols

How have the CDS Index Protocols informed the development of a longer-term cash settlement solution?

- Each Credit Event has been progressively more complicated.
- Collins & Aikman – single Deliverable Obligation.
- Delta/Northwest – multiple Deliverable Obligations.
- Delphi – very high volume name and multiple Deliverable Obligations.
- Calpine – multiple Deliverable Obligations and some questions about deliverability.
- Dana – input error by bidder during auction process.

New Settlement Mechanic

What were the characteristics of the Protocols?

- Index trades were covered, but single name trades were not.
- Cash settlement based on determination of “Final Price” via an auction process.
- Auction process involved a single valuation of selected Deliverable Obligations.
- The Bright Side:
 - Quick to implement
 - High adherence rate
 - Auction process produced a result perceived as fair.
- The Not-So Bright Side:
 - Optional
 - Adherence process creates operational burdens
 - Need to create longer-term solution for the product.

New Settlement Mechanic

What is ISDA developing as interim and long-term solutions?

- In the interim, an off-the-shelf protocol is ready for use.
- Single name and index trades, as well as other credit derivative transaction types, will be covered by the protocol.
- Protocol will be evaluated once a Credit Event occurs and the auction is conducted.
- Possibility of new Credit Derivatives Definitions or a Supplement.
- Legacy trades will need to be addressed.
- DTCC Trade Warehouse.

New Settlement Mechanic

Pre-Auction and Auction Sequence

- Step 1: Credit Event occurs followed by determination that protocol and auction will be held.
- Step 2: Publication of protocol by ISDA.
- Step 3: Participating Bidders (dealers) submit Bid Letters.
- Step 4: On the Auction Date, Participating Bidders submit Inside Market Orders and Request for Physical Settlement.
- Inside Market Orders: matched pairs of bids and offers (aka 10x10s).
- Request for Physical Settlement: orders to buy or sell obligations at the Final Price generated by the auction. Request for Physical Settlement can be submitted by a Participating Bidder for its own account or for a customer's account.

New Settlement Mechanic

Pre-Auction and Auction Sequence con't

- Step 5: Size and direction of Open Interest published.
- Open Interest: Net of Request for Physical Settlement (imbalance between net and net buy positions).
- Step 6: Participating Bidders solicit Limit Orders.
- Limit Orders: Matched to residual imbalance from Request for Physical Settlement.
- Step 7: Final Price published.

New Settlement Mechanic

- Identification and Review of Deliverable Obligations
 - Any market participant may submit Proposed Deliverable Obligations to the Auction Administrator by a certain Cut-Off Date.
 - Any market participant may request a review of the terms of the Proposed Deliverable Obligation.
 - ISDA will appoint a law firm to conduct the review and the analysis will be shared with the market.
 - Review is not binding—simply designed to flag issues regarding deliverability.
- On the Cut-Off Date, the Auction Administrator will publish the Proposed Deliverable Obligation List. The List becomes final if no one objects to any Deliverable Obligation on that List.
- Errors
 - If the Auction Administrators receive corrected information within two to three hours of the publication of the Open Interest, then the Open Interest is recalculated.
 - If the Auction Administrators do not receive corrected information within the required timeframe, then the Open Interest and Final Price are not recalculated.

CDX Index Trade Protocols: Background

- An index trade is a CDS that references a diversified index of names
- Most common indexes are CDX (North America) and iTraxx (Europe)
 - Both indexes consist of 125 (mostly investment grade) corporate names
 - Notional amount divided evenly among all names in index
 - New index every 6 months to account for defaults, mergers, and downgrades
 - If default occurs, settlement of defaulted amount and reduction of remaining notional
- Index trades are larger share of new volume than single name CDS
 - Growth of CDS index trades from negligible in 2003 to over 30% of outstanding notional amount in 2005
 - By 2005, amount of CDS outstanding significantly exceeded supply of underlying bonds to deliver in physical settlement
 - In order to avoid liquidity squeezes and potential settlement failures, ISDA developed CDX Index Trade Protocols to allow physical settlement

CKC and Delta & Northwest Protocols

- The first two protocols involved average price auctions
 - Participating dealers submit bid and offer prices for defaulted bonds
 - When prices cross, dealers must trade at those prices
 - Cash settlement price is average of best remaining bids and offers
- Collins & Aikman (CKC) CDS Index Protocol (May 26, 2005)
 - CKC filed for Chapter 11 bankruptcy on May 17, 2005
 - One senior bond outstanding with par amount of \$500 million
 - Auction held on June 14, 2005 fixed settlement price at 43.625%
- Delta & Northwest CDS Index Protocol (September 23, 2005)
 - Delta Air Lines, Inc. (DAL) and Northwest Airlines, Inc. (NWAC) filed for Chapter 11 on September 14, 2005
 - DAL had \$3.9 billion of senior unsecured bonds outstanding
 - NWAC had \$1.2 billion of senior unsecured bonds outstanding
 - Auction of selection of bonds led to settlement prices of 18.0% for DAL and 28.0% for NWAC

Delta and Northwest Reference Obligations

Delta Air Lines

Northwest Airlines

	Coupon	Maturity		Coupon	Maturity	
1	7.700%	15 December 2005		1	8.875%	1 June 2006
2	10.000%	15 August 2008		2	8.700%	15 March 2007
3	7.900%	15 December 2009		3	9.875%	15 March 2007
4	9.00%	15 May 2016		4	7.875%	15 March 2008
5	9.750%	15 May 2021		5	10.000%	1 February 2009
6	8.000%	3 June 2023				
7	2.875%	18 February 2024				
8	8.300%	15 December 2029				

New Auction Procedure

- The CKC and DAL-NWAC auctions were criticized for insufficient connection to the underlying bond market
 - Did not necessarily lead to a price that cleared the market for underlying physical settlement
- In response, the industry developed a new auction procedure consisting of the following elements:
 - Average price auction to determine starting inside market price
 - Market orders and limit orders
 - Market orders to determine net delivery and receipt obligation
 - Dealers also may submit limit orders to buy or sell at prices below or above their submitted inside market price
 - Dutch auction to determine market-clearing price
 - Cash settlement at the market-clearing price

Delphi Corporation

- Delphi Corporation (DPH) filed for Chapter 11 on October 8, 2005
 - \$2.0 billion of senior debt outstanding
 - Approximately \$28 billion of CDS outstanding
- Affected Indexes
 - DJ.CDX.NA.HY.[4,5], DJ.CDX.NA.IG.[2,3], and iBoxx CDX.NA.IG
 - Dow Jones TRAC-X NA Indexes [Series 1,2]
 - TRACERS
- Delphi CDS Index Protocol issued on October 27, 2005
 - 576 parties signed up
- Auction on November 4, 2005
 - 15 dealers submitted bids
 - Settlement price fixed at 63.375%
 - Price had previously risen above 70% in anticipation of squeeze

Delphi Auction I: Inside Market Prices

- Average price auction to determine starting *inside market price*
 - Inside market price provides a starting point for price determination
- Each participating dealer must provide firm prices for defaulted bonds
- Crossing prices matched and bonds traded at mid-market
- Of the remaining bid and offer prices, the “best half” are used to determine inside mid-market price
- Delphi inside mid-market price was 66.0%

	Sorted descending		Sorted ascending
	Bid (Buy)		Offer (Sell)
UBS	67	64.875	Citi
RBOS	67	65	HSBC
Wach	Crossed trades 66.5	65.5	JPMC
ML	66	66	DB
BofA	65.5	66	GS
Lehman	65.5	66.5	Barclays
Bear	65	67	Bear
CS	65	67	CS
MS	65	67	MS
Barclays	64.5	67.5	BofA
DB	64	67.5	Lehman
GS	64	68	ML
JPMC	63.5	68.5	Wach
HSBC	63	69	RBOS
Citi	62.875	69	UBS

Best half

Inside market midpoint = \$66

Delphi Auction II: Market Orders

- Objective of market orders is to determine net delivery and receipt obligations
- Dealers add up all delivery and receipt obligations for net exposure
 - Obligations are in terms of face value of underlying bonds
 - Includes client obligations submitted through dealers
- Each dealer must submit a market order representing its net exposure
 - Objective is to obtain same economic effect as receiving or paying par value in physical settlement
 - Obligations to deliver (bought protection) are on offer side because receiving bond price plus cash compensation is equivalent to receiving par value for bond in physical settlement
 - Obligations to receive (sold protection) are on bid side because paying bond price plus cash compensation is equivalent to paying par value for bond in physical settlement
- Combined dealer market orders will yield a net deliverable or receivable position

Delphi Auction II: Market Orders

- Combined dealer market orders will yields a net deliverable or receivable position
- If the two sides balance, the cash settlement price is the inside market price
- If they do not balance, remaining “open interest” is matched against limit order book
- For Delphi auction, imbalance was \$99 million offered to sell



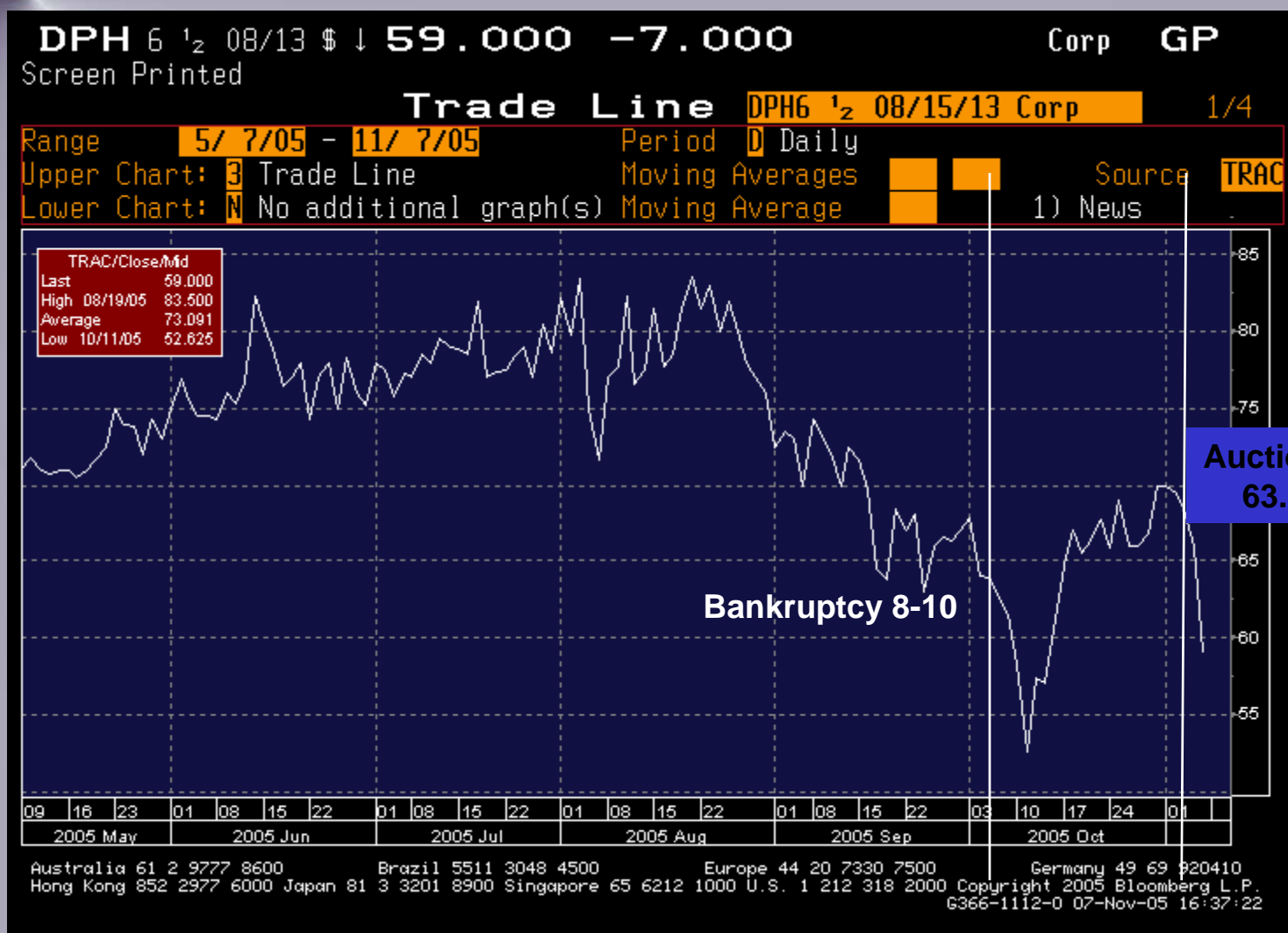
Delphi Auction III: Dutch Auction

- If there is an imbalance, limit orders (and uncrossed inside market prices) are used in a Dutch Auction to determine a price that clears the entire net exposure
 - Move up or down the list of limit orders until bids and offers are equal (buy=sell)
 - The price at which bids and offers are equal is the cash settlement price
- Delphi Auction cash settlement price was 63.375%

	Size (\$mm)	Bid (\$)
BofA	10	65.5
Lehman	10	65.5
CS	10	65
MS	10	65
Bear	10	65
Barclays	10	64.5
Barclays	2	64.5
Lehman	2	64.5
Lehman	2	64.25
DB	10	64
GS	10	64
JPMC	10	63.5
Lehman	3	63.375
Total	\$99mm	



Behavior of Delphi Bonds



Looking Ahead

- Subsequent credit event auctions
 - Calpine (January 17, 2006) – \$6.7 billion of outstanding debt and final settlement price of 19.125%
 - Dana (March 31, 2006) – \$2.5 billion of outstanding debt and final settlement price of 75.0%
- Current issues
 - Although the auction significantly reduces the squeeze on the underlying bonds, it does not completely eliminate it
 - Currently only indexes can be settled according to the auction
 - A new protocol is necessary each time there is a credit event
 - Participation is completely voluntary for each institution
- The industry is moving toward a cash settlement standard
 - ISDA is developing a permanent cash settlement approach for single name CDS along with index and tranche trades
 - There will still be a physical settlement option via dealers
 - Eventual move to cash settlement via permanent protocol for legacy trades and 2007 ISDA Definitions for new trades