Making Sense of Credit Default Swaps (CDS)

May 12, 2009
Presented by: Kevin Baldwin
Director, Education

About the IFM

The Institute for Financial Markets, founded in 1989, is a section 501(c)(3) nonprofit industry-sponsored educational foundation. The IFM is dedicated to providing quality and unbiased information, research data and instruction. The Institute offers independent-study and exam preparatory materials in print and computer-based formats; instructor-led seminars and customized, in-house training; research data; desktop reference tools; and consultancy on industry standards and best practices.

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About the Instructor

Kevin Baldwin began his career in the futures and options industry in 1990 within the largest non-bank FCM’s institutional training department. He taught their six week futures and options course in Chicago for six years. In addition to the six week Chicago program, he provided shorter term derivatives seminars for client institutions in Buenos Aires, Rio de Janeiro, Tokyo, Seoul, London, Mumbai, and Moscow on behalf of the British government’s Know How fund. Mr. Baldwin also taught futures & options courses for the Illinois Institute of Technology’s Master Program in Financial Markets.

In 1996, Kevin Baldwin joined an innovative Introducing Broker in New York City as managing director and had held various securities and futures registrations including Series 3, 4, 7, 24, 30 and 63. In addition to his professional responsibilities, Kevin became an adjunct faculty member for New York University’s School of Continuing Education where he taught both Intermediate Securities Analysis and Futures and Options courses. In 2000, Kevin returned to Chicago and developed a portfolio of websites aimed at different segments of the futures and options community. In the summer of 2006, Mr. Baldwin became the director of education for the Institute for Financial Markets in Washington DC. Since joining the IFM, he has worked to broaden the IFM’s course curriculum offerings to include a Strategies & Tactics course aimed at speculators, a Managing Exposure to Financial Instruments course, a Credit Derivatives-OTC & Exchange-Traded, a Algorithmic Trading course, as well as our well known Series 3 preparation course.

Mr. Baldwin earned a Bachelor of Science degree from San Jose State University in California. He also holds an MBA from the University of Chicago, Graduate School of Business.

Disclosure

The risk of loss in trading commodities can be substantial. You should therefore carefully consider whether such trading is suitable for you in light of your financial condition.

The high degree of leverage that is often obtainable in commodity trading can work against you as well as for you. The use of leverage can lead to large losses as well as gains.

The information contained herein is derived from sources believed to be reliable. The audience should practice their own due diligence.
Introduction

Insuring Uncertainty:
- We pay premiums for car insurance; provides protection in the unlikely event you have an accident
- We pay premiums for mortgage insurance; provides protection to the mortgage underwriter should you stop making house payments
- Municipals often pay premiums for an insurance “wrapper”; guarantor is obligated to make interest payments if municipal fails to pay
- A CDS is similar to an ordinary insurance contract with some important distinctions

What is a CDS?
- A premium is paid to an entity in return for protection, should some event occur.
- A key difference from insurance and a CDS is those buying or selling CDS can trade in/out of them in ways that just aren’t possible in the traditional insurance market.
- A CDS is a privately negotiated bilateral agreement in which one party is the protection buyer (risk shedder), while the other is the protection seller (risk taker). The protection is for an unforeseen credit event that may preclude the reference entity from paying their loans/bonds (default).
- If a credit event occurs, the protection seller is obligated to make a payment to the protection buyer.
Typical Credit Default Swap

**Pays CDS Premium, quoted in bp, paid quarterly**

**Protection Buyer** → **Protection Seller (investor)**

Contingent payment: if a reference entity credit event occurs.

The Protection Seller receives a periodic premium from the Protection Buyer in exchange for a contingent payment if there is a “credit event of the reference entity”. The contingent payment is determined based on a pre-specified settlement terms.

What Kind of Credit’s Can Be Insured?

**Default insurance can be purchased against:**
- A loan –known as LCDS
- A bond
- A corporate name –General Motors
- A sovereign credit due to cross border transactions
- Credit exposure due to a derivative contract such as a counterparty credit exposure in a cross currency swap transaction
- A credit protection on an individual credit or on a basket of credits (names)

For ex. of tradable indexes see [www.markit.com](http://www.markit.com)
ABX.HE: Prime, Alt-A, Subprime
CDX. NAIG: HY, HVOL, EM
Protection Seller Analogous to Short Puts?

Date: 4/1/9 Expiration 6/19/09 ST Rate: 1.00%

1. Short 1 Jun.'9 775.0 Put(s) @ 45.75 = $2,287.5
   [Mkt: 807.75 IVol: 42.57% Delta: 0.3756]
   [Gam: -0.0024 Theta: 0.3850 Vega: -1.4255]

The investor, or protection seller, does not take the price risk of the reference asset, rather they accept only the risk of default. (Price risk & credit risk are correlated)

The investor receives a fee from the seller of the default risk. The investor makes no payment unless a Credit Default event occurs.

Credit default swaps differ from Total Return Swaps precisely for this reason. A Total Return Swap binds the protection seller to accept the reference asset price risk too.

CDS Offers Default Protection Only!
Protection Buyer Analogous to Long Puts?

Date: 4/1/9 Expiration 6/19/09 ST Rate: 1.00%

1. Long 1 Jun.'9 775.0 Put(s) @ 45.75 = $2,287.5
   [Mkt: 807.75 IVol: 42.57% Delta: 0.3756]
   [Gam: -0.0024 Theta: 0.3850 Vega: -1.4255]

Amortizing Premium

Assume a two year CDS with a premium of 48 bp, paid out 6 bp per quarter over 8 quarters.

If a credit event occurs triggering a payment from the protection seller, that seller will receive no further periodic payments.
The ‘plain vanilla’ credit default swap is a payment by one party in exchange for a credit default protection payment if a credit default event on a reference asset occurs.

The amount of the payment is the difference between the original price of the reference asset on the trade date and the “recovery value” of the reference asset, post default.

The recovery value can be contentious, thus it is usually formulaic with alternative obligations available to deliver against the Protection Seller.

Ex: Pre-default price = 100.00, post default price = 40.00 = recovery value
Protection seller owes the protection buyer: 60.00

CDS Settlements

- Physical delivery: of one or several of the reference assets against repayment at par
- Notional minus post-default market value of the reference asset (aka “cash settlement”)
- A pre-agreed fixed pay-off, irrespective of the recovery value (Digital CDS)
Define a “Credit Event”

The definition of what events are covered by CDS is a contentious area of the specification defined by ISDA as one or more of:

- Bankruptcy, filing for protection from creditors -chapter 11 in U.S.
- Failure to pay
- Obligation default or acceleration
- Repudiation or moratorium
- Restructuring – frequently omitted

CDS Spread or Rate

- The spread or rate is the price of the default insurance, usually expressed in basis points (bp=0.01%), per annum, but paid quarterly
- “Spread” is misleading jargon because it is not a “spread” over anything. It is a rate or price of insurance, just like for your car
- Payment: due to complications from getting quotes for post-default debt, physical settlement has been much more popular than cash settlement
- Payments for default normally settle in 4-6 weeks on average
### Nomenclature

- **Long CDS** = protection buyer,
  - short the credit & pays the quarterly premiums
  - a bid of \( xx \) bp on a CDS means the bidder is willing to pay \( xx \) bp/year for credit protection
- **Short CDS** = protection seller,
  - long the credit & collects the quarterly premiums
  - an offer of \( yy \) bp on a CDS means the seller is willing to grant credit protection in return for an annual premium of \( yy \) bp/year

### A Bond is a Loan

- If you own a bond, you have loaned money to someone
- The debt is repaid through annual "coupons" payments and the eventual return of principal at maturity
- If interest rates rise, the cash flow provided is less valuable; if interest rates fall, the cash flow is more valuable
- If the borrower defaults, value is destroyed, you may end up in Court
- Uncertain coupon payments/corpus can be insured
Bond Pricing

The bond price is the series of future cash flows discounted to the present:

\[ \text{Bond Price} = \sum_{i=1}^{I} \frac{\text{Coupons}}{(1 + \frac{r}{n})^{nt}} + \frac{\text{Corpus}}{(1 + \frac{r}{n})^{nt}} \]

The price of a bond is just the present value of its cash flows discounted at an appropriate rate of interest.

Find the one “r”, when used to discount all future cash flow, that returns today’s flat price. This is Yield-to-Maturity, aka YTM. A poor statistic because it assumes the yield curve is flat.

\[ r = \text{yield to maturity}, \ n=2 \text{ payments/year}, \ t = \text{time in decimal} \]

Corporate Bond with Default Possibility

Consider a risky corporate bond

“A” rated company by S& P
Pays annual coupons of: c
Initially sold @ time zero at Par 3 year term
Corporate Credit: with Default Possibility

At $t_3$, there are two possible outcomes:
Default, or no default.

The $100 + C$ claim is contingent on which outcome occurs.

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Parsing the Credit vs. Nominal Yield

Credit spread premium for bonds riskier than prime credit

- Inflation: 2.50%
- Real: 2.25%

- 3 yr Treasury: 4.75%
- Prime-Credit 3y Corp. bond: 5.25%
- BBB credit 3 y Corp. bond: 5.75%

- Default-free rate: Prime-Credit swap
- Credit spread: 50 bp
- +25 bp
- +50 bp

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Incorporating Default-Risk with the Contractual Identity

Defaultable bond = Default-free + Receiver + CDS on the credit's name deposit swap on credit

There are some technical reasons why this contractual identity doesn’t hold up explicitly.

Yet we’re able to decompose a risky corporate bond into its essential elements:
1. A default free instrument (very liquid)
2. An interest rate swap (very liquid)
3. A CDS (very liquid)

* Cash markets in many corporate names is illiquid.

CDS Advantages Over Cash Markets

• Allows participants to trade credit risk separately from interest rate risk or currency risk
• It is MUCH easier to go long/short a credit because finding inventory of cash bonds is moot. Any dealer can show you a market in any credit
• Shorting bonds requires finding inventory to RP and cash markets have a mark-to-market property
• You need not fund a bond position to express a view, more leverage
• No short sale constraints, or need to RP the bonds
• Size: CDS is generally much more liquid than cash
# Which Names Have Active Trade?

**Source**: www.marketaxess.com

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total Volume (GBPm)</th>
<th>Total Trades</th>
<th># Issues Traded</th>
<th>% Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Banks-Brokers</td>
<td>2,645,559</td>
<td>6,689</td>
<td>802</td>
<td>18.2%</td>
</tr>
<tr>
<td>2. Media Telecomm Cable</td>
<td>2,516,335</td>
<td>4,472</td>
<td>305</td>
<td>17.04%</td>
</tr>
<tr>
<td>3. General Industrial</td>
<td>1,745,389</td>
<td>3,753</td>
<td>412</td>
<td>12.0%</td>
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<tr>
<td>4. Finance</td>
<td>1,311,738</td>
<td>6,525</td>
<td>611</td>
<td>9.0%</td>
</tr>
<tr>
<td>5. Oil-Gas-Exploration-Energy</td>
<td>1,087,723</td>
<td>2,006</td>
<td>274</td>
<td>7.5%</td>
</tr>
<tr>
<td>6. Healthcare-Pharmaceuticals</td>
<td>859,320</td>
<td>1,051</td>
<td>142</td>
<td>5.3%</td>
</tr>
<tr>
<td>7. Utility</td>
<td>624,869</td>
<td>1,596</td>
<td>222</td>
<td>4.3%</td>
</tr>
<tr>
<td>8. Retail-Grocers</td>
<td>610,823</td>
<td>1,798</td>
<td>131</td>
<td>4.2%</td>
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<tr>
<td>9. Consumer Products</td>
<td>590,741</td>
<td>1,479</td>
<td>173</td>
<td>3.8%</td>
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<tr>
<td>10. Insurance</td>
<td>527,074</td>
<td>1,089</td>
<td>252</td>
<td>3.6%</td>
</tr>
<tr>
<td>11. Bldy Products-Homes-REITS</td>
<td>466,852</td>
<td>556</td>
<td>125</td>
<td>5.2%</td>
</tr>
<tr>
<td>12. Auto-Auto Parts</td>
<td>412,904</td>
<td>1,099</td>
<td>132</td>
<td>2.8%</td>
</tr>
<tr>
<td>13. Technology</td>
<td>397,484</td>
<td>597</td>
<td>60</td>
<td>2.2%</td>
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<tr>
<td>14. Auto-Defense Transportation</td>
<td>327,574</td>
<td>505</td>
<td>94</td>
<td>2.2%</td>
</tr>
<tr>
<td>15. Emerging Markets</td>
<td>215,382</td>
<td>205</td>
<td>29</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

## Who Can Trade?

**THE INSTITUTE FOR FINANCIAL MARKETS**

<table>
<thead>
<tr>
<th>Market Name</th>
<th>Commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>Grains</td>
</tr>
<tr>
<td>Silver</td>
<td>Soybeans</td>
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<tr>
<td>Platinum</td>
<td>Soymeal</td>
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<tr>
<td>Aluminum</td>
<td>Bean Oil</td>
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<tr>
<td>Copper</td>
<td>Corn</td>
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<td>Lead</td>
<td>Wheat</td>
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<td>Tin</td>
<td>R.Rice</td>
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<tr>
<td>Zinc</td>
<td>Oat</td>
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<tr>
<td>Platinum</td>
<td>Softs</td>
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<tr>
<td>Eurodollars</td>
<td>Cocoa</td>
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<tr>
<td>Bond Return Index</td>
<td>Cotton</td>
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<tr>
<td>TSE</td>
<td>Coffee</td>
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<tr>
<td>Russell 2000</td>
<td>Sugar</td>
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<tr>
<td>DJIA Mini</td>
<td>W-sugar</td>
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<tr>
<td>EuroStoxx</td>
<td>Ethanol</td>
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<tr>
<td>All-Ords</td>
<td>WTI Crude</td>
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<tr>
<td>Nikkei</td>
<td>Brent Crude</td>
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<tr>
<td>KOSPI</td>
<td>Heating Oil</td>
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<tr>
<td>Hang Seng</td>
<td>Gas Oil</td>
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<tr>
<td>Bovespa</td>
<td>Natural Gas</td>
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<td>MexBolsa</td>
<td>Gasoline</td>
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<td>Dax</td>
<td>Propane</td>
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<td>FTSE</td>
<td>Electricity</td>
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<td>MIB30</td>
<td>Climateology</td>
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<tr>
<td>Metals</td>
<td>(Weather)</td>
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<tr>
<td>Metals</td>
<td>Pollution</td>
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<tr>
<td>Metals</td>
<td>Rate Swaps</td>
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<tr>
<td>Metals</td>
<td>Mortgages</td>
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<tr>
<td>Metals</td>
<td>CRB</td>
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<tr>
<td>Metals</td>
<td>Goldman Index</td>
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<tr>
<td>Metals</td>
<td>DJ-AIG Index</td>
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<td>Metals</td>
<td>USDX</td>
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<td>Metals</td>
<td>Trackers</td>
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<td>Ref.Sunflower</td>
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<td>Metals</td>
<td>Sesame Seed</td>
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<td>Cashews</td>
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<td>Steel Long</td>
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<td>Metals</td>
<td>Steel Flat</td>
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<tr>
<td>Metals</td>
<td>Furnace Oil</td>
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<tr>
<td>Metals</td>
<td>Mid-east Sour</td>
</tr>
<tr>
<td>Metals</td>
<td>Rubber</td>
</tr>
</tbody>
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We think the size of the market is near $35 trillion now.

Source: International Swaps and Derivatives Association (swaps), Federal Reserve via Haver Analytics (debt outstanding)
Derivative Contracts by Product
All Commercial Banks
Year-ends 1995 - 2007, Quarterly - 2008

Five Banks Dominate in Derivatives
All Commercial Banks, Fourth Quarter 2008
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Calendar of Events

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For a calendar of upcoming courses go to www.ifm.org

Upcoming CDS Courses

- **New York**
  Tuesday, June 2, 2009 – 9:00 AM – 5:00 PM

- **Washington DC/Crystal City**
  Friday, June 19, 2009 – 9:00 AM – 5:00 PM

- **Chicago**
  Thursday, June 25, 2009 – 9:00 AM – 5:00 PM