Credit Derivatives: CDS, CDO and financial crisis

25 Oct 2010

QIAO Yang
SHEN Si
Agenda

- Historical background: what is Credit Default Swaps (CDS) and Collateralized Default Obligation (CDO)
- Issue and problem: risk valuation
- How financial crisis is related to CDS and CDO
- Approaches to address the issue: Regulatory development and central clearing
- Future Direction
Credit Derivatives Basics

- A credit derivative is a financial contract that allows one to take or reduce credit exposure, generally on bonds or loans of a sovereign or corporate entity.
- Primarily used to:
  - express a credit view
  - reduce risk arising from ownership of bonds or loans
- Credit derivatives
  - Credit Default Swaps
  - CDOs
  - Credit Indices
  - Nth-to-default basket
  - Credit-linked notes
- Credit derivatives have become mainstream and are integrated with credit trading and risk management
Credit Default Swap/Insurance

- Credit Default Swap have existed since early 1990s, it is an agreement between two parties to **exchange the credit risk** of an issuer (reference entity).
- Buying insurance on Credit Events
  - an insurance policy on a risky asset.

- **Buying protection**
  - insures against loss

- **Selling protection**
  - Collect fees/premium

**Diagram:**
- **Default Protection Buyer**
- **Default Protection Seller**
- Periodically Interest Payment
- Par Value Payment (When Default)
## CDS Parameters

<table>
<thead>
<tr>
<th>Which credit?</th>
<th>• Reference obligation (Bonds, Loans, equity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notional amount</td>
<td>• Par value (e.g. USD 1 billion, SGD 500 million)</td>
</tr>
</tbody>
</table>
| Coupon | • Fixed Coupon  
(e.g. 3% Semi Annual, 4% Quarterly) |
| Spread | • Annual payment (premium) quoted in bps  
• Spread = Coupon - benchmark rate  
(government bonds, indices, LIBOR) |
| Maturity | • Expiration of contract  
• 3, 5, 7, 10 years  
• 5 year contract most liquid |
| Recovery Rate | • Depending on geographical region  
• empirical evidence |
Collateralized Debt Obligations (CDOs)

- CDOs are a type of asset backed security whose value and payments are derived from a portfolio of fixed-income underlying assets (bonds, loans, mortgages, etc.)
- Split into tranches with different risk classes
- First issued in 1987 by Drexel Burnham Lambert
- Similar to fixed income securities: principal and interest payment
- Usually constructed by creating a special purpose vehicle (SPV), a company that buys the underlying assets and issue CDOs backed by the assets
Collateralized Debt Obligations (CDOs)

First to claim in case of default

Last to claim in case of default

Source: Bionicturtle.com
Pre-crisis CDS Market

- Banks are the main players in CDS Market
- Massive size of market
07-08 financial crisis in a nutshell

- Capital easing policy, property market is hot
- Banks inject loans into housing market
- Banks sell loans to investors by packaging them in the form of CDOs
- Housing market hotter, investors looking bullish, enter CDS on CDOs
- Housing market collapsed, loan obligators default. Banks have no cash inflow, so banks default on CDOs, then investors default on CDS.
- Capital market dries up, no liquidity. Banks, as the guys sitting at the middle of the CDO/CDS market, suffers from huge loss
- Banks finally default, which triggers the global financial crisis
Issue with Credit Derivatives: Risk valuation

• Lack of transparency: OTC contracts
• Counterparty risk: Not easy to verify, SPV is separated from bank’s balance sheet, leads to incorrect credit rating
• Heavy reliance on credit ratings made by credit rating agencies (Moody’s, S&P, Fitch)
• In order to increase the transaction volume, banks set low credit requirements and perform poor credit checks. Resulting in inflated credit ratings.
How to address the issue?

• Improve transparency
  - Details of OTC contracts to be disclosed

• Tighter regulations and government supervisions
  - Central Clearing
  - New legislation act

• Stricter risk control/credit evaluation
  - Higher credit requirement
  - Improve risk management
  - SPVs are reflected in balance sheet
  - Separation of prop trading house and underwriter
How to address the issue (Central Clearing)

- Central Clearing: improve transparency, remove the counterparty risk.

Source: IS423 Lecture Slides 4
Regulatory action to the issue

- **US, Frank-Dodd Legislation (July, 2010)**
  - Limit excessive risk taking by banks including prop trading, hedge fund and private equity
  - Enhanced capital requirement for banks: 6% Tier 1 capital ratio and 10% total capital ratio.
  - Derivatives trading and clearing to be done through regulated exchanges.

- **International, Basel III**
  - New and more stringent capital requirement
  - 7% core Capital and Total 10.5% by Jan 2019
  - Legacy Tier1 capital and Tier 2 capital instruments will be phased out, and new capital requirement will be phased in
Future of Credit Derivatives

• Traded and settled through regulated entity (Exchange or clearing house)
• Lower risk appetite
• Lower credit ratings which reflect the true risk of the derivatives
• Market growing at a moderate pace
References

- “Options, Futures and other derivatives” 7th Ed, John C Hull, Prentice Hall
- “CDOs in plain English”, Nomura Securities
- “CDO Handbook”, JP Morgan Global Structured Finance Research
- Wikipedia - Credit Default Swap: http://en.wikipedia.org/wiki/Credit_default_swap#Risk
- IS 423 Lecture Slides