An Introduction to Synthetic Collateralized Debt Obligations

Dr. Matthew Brigida

Department of Accounting and Finance
College of Business Administration
SUNY Polytechnic Institute
Utica, NY
`matthew.brigida@sunypoly.edu`

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Collateralized Debt Obligations (CDOs)

CDOs are packages of debt securities, such as mortgages, auto loans, and credit card receivables.

- The CDO is often divided into *tranches* representing payment order.
- Ownership of the debt securities within the CDO is transferred to the CDO buyer.

The CDO buyers' investment is passed through to the borrowers, who then make periodic interest payments, which are returned to the CDO buyers as determined by the tranche structure.

Benefits of CDOs

- Provides investors with a diversified portfolio of debt securities with low transaction costs.
- By facilitating investor capital inflows to these debt securities, CDOs provide borrowers with lower financing costs.
- Tranche structure allows varying risk/return profiles to be created from a potentially homogeneous portfolio of securities.

Synthetic CDOs

- Provides investors with all the economic benefits of owning the CDOs, just without the transfer of ownership of the underlying debt securities.
  - The underlying portfolio is comprised of Credit Default Swaps (CDS) bought from the Synthetic CDO buyer, the payments on which form the 'interest' on the CDO.
- Can be created more quickly, and with less expense, than non-synthetic CDOs.
- Allows various contract sizes.

Credit Default Swaps (CDS)

CDS are a form of protection, or insurance, on debt securities.

- The CDS buyer makes periodic premium payments to the CDS seller.

- If there is a credit event (default) in the underlying debt securities, then the terms of the CDS would commonly transfer the par value of the defaulted bond in cash from the CDS seller to the buyer. The buyer would transfer the ownership of the defaulted bond to the seller.

Synthetic CDO

To construct a Synthetic CDO:

1. An underlying reference portfolio of debt securities is selected.

2. CDS are sold (by the Synthetic CDO buyer) against tranches of the underlying portfolio. Synthetic CDO buyer puts up margin.

3. Periodic insurance payments are then passed through from the Synthetic CDO seller to the Synthetic CDO buyer as if they were interest payments.

4. In the case of defaults on the underlying debt securities, just as in a plain CDO, owners of the lower tranches would lose their capital, which is transferred to the Synthetic CDO seller.

Example Synthetic CDO

https://mattbrigida.shinyapps.io/SCDO/

Application
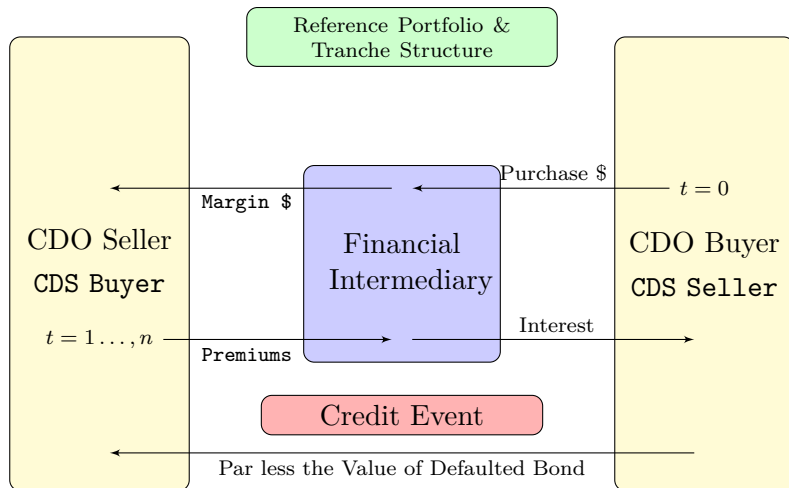
Our company which wants to build a Hydroelectric generating station in Brazil.

- If Brazilian electricity prices fall while constructing the station, our company may incur substantial losses.
- Without a method of hedging, this risk may preclude us from making the investment.

Application

We can hedge our risk by selling a Single-Tranche Synthetic CDO on a portfolio of bonds issued by Brazilian electricity producers.

- If the Brazilian electricity producing industrial sector does well, so will our Hydroelectric station.
- If the industry experiences trouble, we will incur losses on our station, but these losses are mitigated by payments received on our short Synthetic CDO.

Since this is a Synthetic CDO we don't have to worry about obtaining actual ownership of the underlying bonds. Buying the bonds may be troublesome if Brazilian markets for the bonds are illiquid, causing high transaction costs.

Application

Since this entails us buying CDS on the bonds, without owning them, this is often termed a naked purchase of CDS.

- This term is not apt, however, because we are hedging our economic interest in the health of the Brazilian electricity producing industry.

Does demand for Synthetic CDOs affect CDO prices?

- Buy Synthetic CDO ⇒ Sell Insurance ⇒ Easier to Insure Assets ⇒ Raises Asset Prices ⇒ Lower Rates on CDOs.

Need data to test empirically.

Questions/Comments