

Financial Risk Management

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- 1 Different Type of CDOs
- 2 Questions we would like to explore

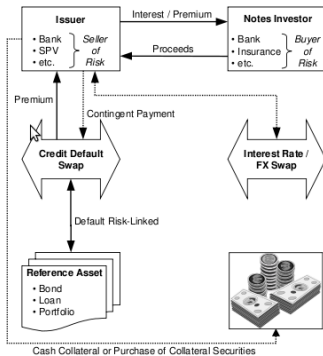


FIGURE 7.8
Example of a Credit-linked Note.

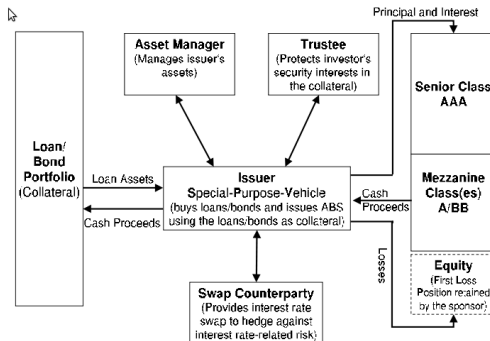


FIGURE 8.2
Example of a cash flow CDO transaction.

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Synthetic CDO

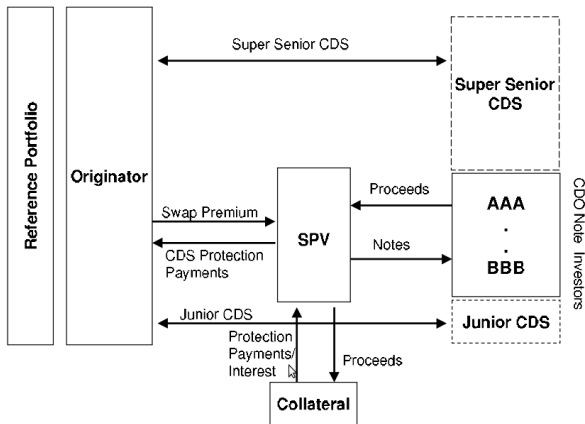
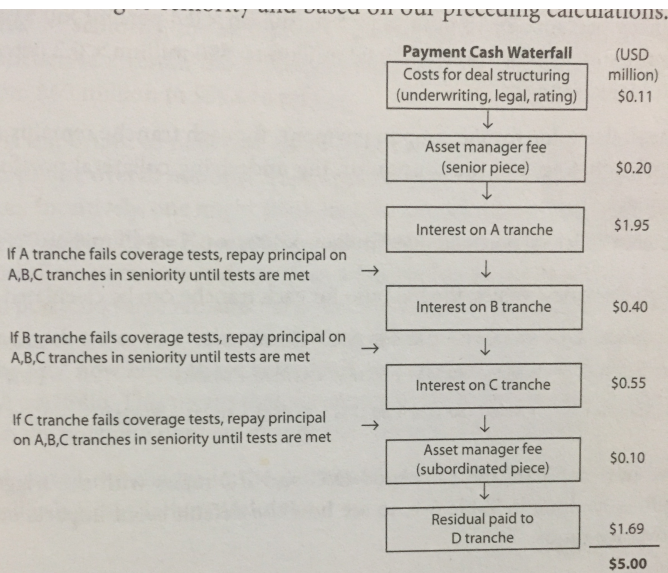


FIGURE 8.4
Example of a synthetic CDO transaction.

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Synthetic CDO



Overcollateralization (O/C) and Interest Coverage (I/C)

Overcollateralization (O/C) =

$$\frac{\text{Principal Value of collateral portfolio}}{\text{Principal for tranche} + \text{Principal for all tranches senior to it}}$$

Interest Coverage (I/C) =

$$\frac{\text{Scheduled interest due on underlying collateral portfolio}}{\text{Scheduled interest to that tranche} + \text{Scheduled interest to all tranches senior to it}}$$

A Numerical Example of O/C and I/C tests

Let's exemplify how to use the O/C and I/C tests. Assume that there is a standard CDO, using as collateral high-yield bonds with combined a value of \$ 100 million.

The CDO and its tranches are summarized in Table-6-3.

H	Tranche Class	Notional Amount	Rating	Spread	O/C Target	I/C Target
	A	\$ 60 million	AAA	50 bps	1.350	1.600
	B	\$ 10 million	BBB	200 bps	1.250	1.400
	C	\$ 10 million	BB	500 bps	1.130	1.200
	Equity	\$ 20 million	Not rated	N.A.		
		\$ 100 million				

- We assume that collateral has a weighted average coupon rate of 10.0 percent.
- The CDO itself has a five-year maturity with semi-annual coupons paid to the investors; notes are grouped in four tranches.
- In addition the SPV charges deal structuring fee of 100 basis points of the notional amount, which is amortized over the life-span of the CDO at 5 percent.
- The current prevailing risk-free interest rate is otherwise 6 percent.
- The yearly asset manager fee is 40 basis points per year for the senior tranche and 20 basis points for the sub-ordinate tranche.

- The deal structuring fee, given a five-year maturity and a 5 percent annual rate on 100 basis points of the collateral's principal, can be calculated to be \$ 0.11 million using the general formula.

$$100 \times (100bp) = \sum_{t=1}^{10} \frac{F}{(1 + 0.5 \times 5\%)^t}$$

and solving for F, which denotes the deal structuring fee.

- The asset management fee for the senior tranche becomes \$ 0.2 million ($= \$ 100 \text{ million} \times 0.4 \text{ percent} \times 0.5$) and for the subordinated debt \$ 0.1 million ($= \$ 100 \text{ million} \times 0.2 \text{ percent} \times 0.5$)

Semiannual Coupon for each tranche

- For Interest Collateral portfolio = \$ 100 millions \times 10% \times 0.5 = \$ 5.0 millions.
- Interest on Tranche A = \$ 60 millions \times (6% + 50 bp) \times 0.5 = \$ 1.95 millions.
- Interest on Tranche B = \$ 10 millions \times (6% + 200 bp) \times 0.5 = \$ 0.4 millions.
- Interest on Tranche C = \$ 10 millions \times (6% + 500 bp) \times 0.5 = \$ 0.55 millions.

- I/C ratios for Tranche A = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M} = 2.212$
- I/C ratios for Tranche B = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M + \$0.4M} = 1.879$
- I/C ratios for Tranche C = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M + \$0.4M + \$0.55M} = 1.557$

Adjustment Calculation –

- I/C ratios for Tranche A = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M} = 2.212$
- I/C ratios for Tranche B = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M + \$0.4M} = 1.879$
- I/C ratios for Tranche C = $\frac{\$5.0M}{\$0.11M + \$0.2M + \$1.95M + \$0.4M + \$0.55M} = 1.557$

What happens when tests fail

- Situation : Let's assume notional amount drops from 100 million to 90 million. O/C takes value 1.125 lower than the threshold value 1.13 and O/C test fails for tranche C.

Action : C will collect payments from principal from A, B and C on seniority until tests are met. Question : How much repayment should go ?

- Solve for : $90 / (60 + 10 + 10 - y) \geq 1.13$ gives $y = 0.354$ million. Therefore, principal amount of A will drop down from 60 to 59.646.