DEBT SECURITIES

Topic 11: Asset backed securities

LA TROBE UNIVERSITY Faculty of Law and Management

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References

> **Fabozzi, F.J. (2007)** *Fixed Income Analysis*. John Wiley and Sons. Chapter 11.

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Student learning objectives

11.1 Illustrate the basic structural features of, and parties to, a securitisation transaction;

11.2 Explain prepayment tranching and credit tranching;

11.3 Distinguish between the payment structure and collateral structure of a securitisation backed by amortising assets and non-amortising assets;

11.4 Distinguish among the various types of external and internal credit enhancements;

11.5 Describe the cash flow and prepayment characteristics for securities backed by home equity loans, manufactured housing loans, auto-mobile loans, student loans, SBA loans and credit card receivables;

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Introduction

- As an alternative to issuing a bond, corporations can issue a security backed by loans or receivables.
- Debt instruments that have as their collateral loans or receivables are referred to as asset backed securities. The transaction in which asset backed securities (ABS) are created is referred to as a securitisation.
- The largest sectors of the asset backed securities market in the U.S. other than mortgage backed securities, include those backed by:
  - Credit card receivables
  - Auto loans
  - Home equity loans
  - Manufactured housing loans
  - Student loans
  - Small Business Administration Loans
  - Corporate loans
  - Bonds

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Student learning objectives

11.6 Describe a collateralized debt obligation (CDO) and the different types (cash and synthetic).

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Objective 11.1

Securitisation process

- The securitisation process can be illustrated using an example:
- Quality Home Theatres (QHT) manufactures high-end equipment for home theatres
- The bulk of their sales are by instalment sales contracts (where the buyer agrees to pay QHT over a specified period of time), which are essentially loans with the equipment as collateral and a defined maturity and rate of interest.
- QHT (**the originator**) makes the decision as to whether to extend credit to the purchaser
- QHT may also service the loan in-house, or outsource the servicing of the loan (to a **servicer**)

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Objective 11.1

Securitisation process

- If QHT wants to raise funds, rather than issue bonds it may securitise its instalment sales contracts
- To do so QHT (**the seller**) will set up a **special purpose vehicle (SPV) (the trust)** and sell to it the instalment sales contracts, in return for cash
- The SPV (**the issuer**) raises the funds required to pay for the instalment sales contracts by selling **asset backed securities** which offer the instalment sales contracts as **collateral**
- In the prospectus for the issue of securities it will state:
  - "The securities represent obligations of the issuer only and do not represent obligations of or interests in the seller or any of its affiliates."

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Objective 11.1

Securitisation process

- Payments that are received from the collateral are distributed to pay servicing fees, other administrative fees, and the principal and interest to the security holders
- The prospectus will detail the priority and amount of payments to be made to the servicer, the administrator and the security holders of each bond class

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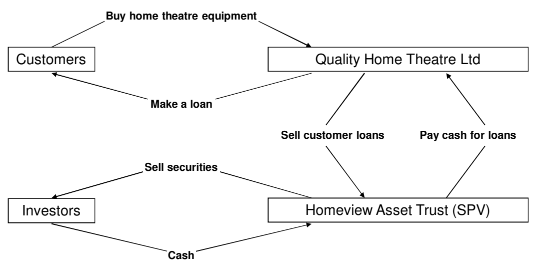
Objective 11.1

Securitisation process



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Objective 11.1

Securitisation process

- The following parties appear in the illustration on the previous slide:

Party	Description	Party in illustration
Seller	Originates the loans and sells loans to the SPV	Quality Home Theatres Ltd
Issuer/Trust	The SPV that buys the loans from the seller and issues the asset-backed securities	Homeview Asset Trust
Servicer	Services the loan	Quality Home Theatres Ltd

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Objective 11.2

Structure 1: Single tranche

- A transaction may involve the sale of a single bond class or tranches
- QHT might sell $100 million worth of instalment sales contracts to the SPV for payment of $100 million cash
- SPV might raise the funds to purchase the instalment sales contracts by selling 100,000 Bond Class A with a par value of $1,000 per certificate
- Each certificate holder would be entitled to 1/100,000 of the payment from the collateral after payment of fees and expenses

Bond class	Par value ($m)
A	100

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Objective 11.2

Structure 2: Multiple prepayment tranches

- SPV might raise the funds to purchase the instalment sales contracts by selling 40,000 Bond Class A1, 30,000 Bond Class A2, 20,000 Bond Class A3 and 10,000 Bond Class A4, each with a par value of $1,000 per certificate
- A sequential structure would require the A1 Class to be repaid all principal prior to A2 Class and so on
- This structure redistributes the prepayment risk, by redistributing the two components of prepayment risk – contraction risk and extension risk

Bond class	Par value ($m)
A1	40
A2	30
A3	20
A4	10
Total	100

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Objective 11.2

Structure 3: Multiple credit tranches

- The SPV might raise the funds to purchase the instalment sales contracts by selling 90,000 Bond Class A, and 10,000 Bond Class B, each with a par value of $1,000 per certificate
- The Class A bonds are senior bonds ranking prior to the subordinate Class B bonds
- Losses resulting from defaults of the borrowers are realised by the Class B holders prior to the Class A holders
- This structure redistributes the credit risk, so as to reduce the credit risk of Class A holders at the expense of Class B holders. If defaults are not greater than $10m in total, then Bond A will be repaid fully its 90m.

Bond class	Par value ($m)
A	90
B	10
Total	100

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Objective 11.2

Structure 4: Multiple prepayment and credit tranches

- The SPV might raise the funds to purchase the instalment sales contracts by selling certificates in a range of different credit and prepayment tranches, each with a par value of $1,000 per certificate
- The Class A bonds are senior bonds, ranking prior to the subordinate Class B bonds, which rank prior to subordinate Class C bonds
- Class A bonds are further tranched according to their ranking for repayment of principal
- This structure redistributes the credit risk, so as to reduce the credit risk of Class A holders at the expense of Class B and C holders
- It also redistributes the prepayment risk among senior bond holders

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Objective 11.2

Structure 4: Multiple prepayment and credit tranches

Bond class	Par value ($m)
A1 (senior)	35
A2 (senior)	28
A3 (senior)	15
A4 (senior)	12
B (subordinated)	7
C (subordinated)	3
Total	100

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Objective 11.3

Amortising and non-amortising collateral

- The assets offered as collateral can be divided into:
  - **Amortising assets**, such as residential mortgages, home equity loans and auto loans, which schedule repayments of both principal and interest on the reducing principal outstanding
  - **Non-amortising assets**, such as credit card receivables, which require minimum periodic payments of interest with no scheduled principal repayments. If the payment is less than the interest on the outstanding loan balance, then the shortfall is added to the loan balance. If the payment is more than the interest on the outstanding balance, then the loan balance is reduced by the difference. The concept of a prepayment of principal only applies to amortising assets as non-amortising assets do not have any **scheduled** principal payments

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Objective 11.3

Amortising and non-amortising collateral

- The type of collateral, whether amortising or non-amortising, impacts on the structure of the transaction
  - When amortising assets are securitised there is no change in the composition of the collateral over the life of the securities, except for loans that are removed due to defaults and full principal repayment due to prepayment or full amortisation.
  - When non-amortising assets are securitised the composition of the collateral changes. Payments from collateral include both interest and principal. The interest is distributed to security holders. The principal can either be paid out to security holders OR reinvested in new collateral.

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Objective 11.4

Credit enhancement

- All asset backed securities are credit enhanced, which provides support for one or more of the bond holders in the structure
- Credit enhancement levels are determined relative to a specific credit rating desired by the issuer for a security by each rating agency
  - For example, a rating agency may require credit enhancement equal to four times expected losses to obtain a triple A rating or three times expected losses to obtain a double A rating
- There are two types of credit enhancement
  - External credit enhancement
  - Internal credit enhancement

Asset Backed Securities

Objective 11.4

External credit enhancement

- The most common types of external credit enhancement are:
- **Monoline insurance policy**, which may provide timely payments of interest and principal up to a specified amount should the issuer fail to make the payments. Unlike municipal bond insurance, the monoline insurance policy only guarantees up to a specified portion of the principal, say 5%, rather than the entire principal
- **Letter of credit from a bank**
- **Guarantee from the seller of the assets**
- The latter two forms of credit enhancement are less common, based on the "weak link approach" employed by the rating agencies.
  - This means that credit enhancement is only as strong as the weakest link in the enhancement mechanisms, regardless of the quality of the underlying assets.
  - Most banks (that offer letters of credit) and companies (serving as guarantor) are unlikely to have a high enough credit rating for the desired enhancement.

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Objective 11.4

Internal credit enhancement

- The most common types of internal credit enhancement are:
- **Cash reserve funds**, which are deposits of cash generated from the issuance proceeds
- **Excess spread accounts**, which are cash deposits generated from the allocation of excess spread after paying out the net coupon, servicing fee and all other expenses on a monthly basis
- **Overcollateralization**, which is the difference between the amount paid for the assets (which equals the par value of the securities) and the market value of the assets
- **Senior-subordinate structure**, where subordinate tranches provide credit enhancement for senior tranches.

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Objective 11.4

Call provisions

- Asset backed securities may contain a call provision, such as:
  - **Call on or after a specified date**, whereby once a specified date has been reached the trustee may call the bonds
  - **Auction call**, whereby at a certain date a call will be exercised if an auction results in the outstanding collateral being sold at a price greater than its par value. The premium over par value is eventually distributed to the seller of the assets.
  - **Percent of collateral call**, where the outstanding bonds can be called at par if the collateral's balance falls below a predetermined percent of the original collateral balance
  - **Percent of bond call**, where the outstanding bonds can be called at par if the outstanding bond's par value relative to its original par value falls below a specified amount
  - **Insurer call**, permits the insurer to call if the collateral's cumulative loss history reaches a predetermined level

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Objective 11.5

Different types of asset backed securities

- Home equity loans
- Manufactured housing backed securities
- Auto loan backed securities
- Student loan backed securities
- Small business administration (SBA) loan backed securities
- Credit card receivable backed securities

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Objective 11.5

Home equity loans (HELs)

- This is a second or third lien on property that was already pledged to secure a first lien, typically where a borrower has used a home equity loan to consolidate consumer debt using the current home as collateral as opposed to obtaining funds to purchase a new home
  - Can be closed-end or open-end HELs
- **Cash flow** is comprised of interest, regular scheduled principal repayments and prepayments
- **Payment structures** include tranches with prepayment protection
- **Prepayments** require a prepayments model to forecast cash flows
  - A base case prepayment benchmark specific to the issuer is used in the prospectus to define the forecast prepayment speed
  - This is referred to as a prospectus prepayment curve, or PPC
  - Multiples of the PPC may be quoted to define faster or slower prepayments

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Objective 11.5

Manufactured housing backed securities

- These are securities backed by loans for manufactured homes (built at a factory and then transported to a site), either mortgages on land and kit homes or consumer retail instalment loans on kit or mobile homes only.
- **Cash flow** is comprised of interest, regular scheduled principal repayments and prepayments
- **Payment structures** similar to home equity loan backed securities
- **Prepayments** are more stable than for MBS and HELs, as manufactured housing backed securities are not as sensitive to refinancing
  - The loan balances are typically smaller, so there are not significant savings from refinancing
  - High rate of depreciation on mobile homes in the earlier years means that the value of the asset is typically less than the loan and hence difficult to refinance
  - Borrowers are typically of low or lower credit worthiness, and therefore find it difficult to obtain funds to refinance
  - Prepayment speed is measured by CPR and the prospectus contains a PPC

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Objective 11.5

Auto loan backed securities

- These are securities backed by loans made to purchase a car. They represent about 18% to 25% of the asset backed securities market in the US
- Issued by financial subsidiaries of auto manufacturers, commercial banks and independent finance companies. The market is tiered, based on the credit quality of the borrowers
- **Cash flow** is comprised of interest, regular scheduled principal repayments and prepayments
- **Prepayments** result from sales and trade-ins requiring full payoff of the loan, repossession and subsequent resale, loss or destruction of the vehicle covered by an insurance claim, payoff of the loan with cash to save on interest, or refinancing of the loan at a lower rate
  - Prepayments due to repossession and subsequent resale are sensitive to the economic cycle
  - Refinancing is only a minor issue because the interest rates for some deals are substantially below market rates since they are offered by manufacturers as part of sales promotions.

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Objective 11.5

Auto loan backed securities

- Prepayments for auto loan-backed securities are measured in terms of the absolute prepayment speed (ABS). The ABS is the monthly prepayments expressed as a percentage of the original collateral amount. The SMM (monthly CPR) expresses prepayments based on the prior month's balance:

$$SMM = \frac{ABS}{1-[ABS \times (M-1)]}$$

$$ABS = \frac{SMM}{1+[SMM \times (M-1)]}$$

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Objective 11.5

Student loan backed securities (SLABS)

- These are securities backed by loans made to cover university costs and costs of a wide range of vocational and trade schools. Loans are typically guaranteed by the government up to 98%. Sallie Mae (a government sponsored entity) is the major issuer of SLABS
- **Cash flow** is comprised of interest, regular scheduled principal repayments and prepayments; however, no cash flow occurs until six months after graduation
- The **interest rate** on some of the loans is floating indexed to a 3-month Treasury bill rate. A large percentage of SLABS are indexed to LIBOR.
- **Prepayments** result from defaults (via the government guarantee) or loan consolidation when the student who has loans over several years combines them into a single loan.
- **Deferment period**: no payments are made by the student on the loan when they are in school.
- **Grace period**: usually six months after the student leaves school.

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Objective 11.5

SBA backed securities

- These are securities backed by loans made by the Small Business Administration, which is an agency of the US government, to qualified borrowers.
- Loans are backed by the full faith and credit of the US government
- **Cash flow** is comprised of interest, regular scheduled principal repayments and prepayments
- The **interest rate** on the loans is typically floating indexed to the prime rate
- **Prepayments** tend to be greater for loans with maturities of less than 10 years made for working capital purposes, whereas loans backed by real estate tend to prepay at a slower speed

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Objective 11.5

Credit card receivable backed securities

- These are securities backed by credit card receivables, and are issued by banks (Visa and Mastercard), retailers and travel and entertainment companies (American Express).
- **Cash flow** is comprised of finance charges, fees and principal after the expiry of the lock-out period, during which principal payments are reinvested
- The **interest rate** on the securities may be fixed or floating
- **Payment structures** include a passthrough structure, a controlled amortization structure and a bullet payment structure
  - Passthrough structure pays principal on a pro rata basis
  - Controlled amortization structure pays the lesser of a scheduled minimum principal payment and the pro rata amount
  - Bullet structure makes a single payment of principal

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Objective 11.5

Credit card receivable backed securities

- **Performance** of a portfolio of receivables is assessed with reference to:
- The **net portfolio yield** with the WAC (or average yield)
  - Gross portfolio yield includes finance charges collected and fees
  - Charge-offs represents amounts charged off as uncollectable (bad debts)
  - Net portfolio yield = gross portfolio yield – charge-offs
- The **monthly payment rate (MPR)**
  - Represented by the monthly payment (including finance charges, fees and any principal repayment) of a credit card receivable divided by the credit card debt outstanding in the previous month
  - MPR is an important indicator, as low MPRs may have extension risk effects or lead to activation of early amortization triggers

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Objective 11.6

Collateralized debt obligation (CDO)

- A collateralized debt obligation is a security backed by a diversified pool of one or more of the following types of debt obligations:
  - US domestic high-yield corporate bonds
  - Structured financial products (mortgage and asset backed securities)
  - Emerging market loans
  - Bank loans
  - Special situation loans and distressed debt
- When the underlying pool of debt obligations are bond-type instruments (high-yield corporate bonds, structured financial products, and emerging market bonds), a CDO is referred to as a collateralized bond obligation (CBO).
- When the underlying pool of debt obligations are bank loans, a CDO is referred to as a collateralized loan obligation (CLO).

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Objective 11.6

CDO structure

- An asset manager is responsible for managing the portfolio of debt obligations held by a SPV
- The assets held by the SPV are funded by the issuance of debt obligations (i.e. tranches)
- Tranches will include one or more of each of: senior tranches; mezzanine tranches; and a subordinate/equity tranche
- A rating will be sought for all but the subordinate tranche
- One or more of the tranches will be a floating tranche
- The cash flow to meet payments to the tranches will come from coupon interest payments, maturing assets and the sale of assets in the underlying pool

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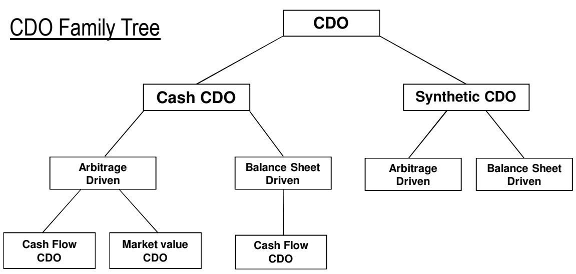
Objective 11.6

CDO types



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Objective 11.6

Family of CDOs

- **Cash CDO** is backed by a pool of cash market debt instruments. These were the original types of CDOs issued.
- **A synthetic CDO** is a CDO where the investor has the economic exposure to a pool of debt instruments, but this exposure is realized via a credit derivative instrument rather than the purchase of the cash market instruments.
- **Arbitrage CDOs** are those CDOs that are motivated by the desire of the sponsor to earn a spread on the yield offered on the debt obligations held in the pool and the payments made to the security holders in the tranches
- **Balance sheet CDOs** are those CDOs that are motivated by the desire of the sponsor to remove debt instruments from its balance sheet
- In a **cash flow CDO** the primary source is the interest and maturing principal from the underlying assets.
- In a **market value CDO**, the proceeds to meet the obligations depend on the total return generated from the portfolio.

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Example 11.6.1

Cash CDO Arbitrage transactions

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- Collateral:
  - $100m of 10-year bonds at Treasury + 400bp
- The CDO structure:
  - $80m senior tranche at LIBOR + 70bp
  - $10m mezzanine tranche at 10-year Treasury + 200bp
  - $10m subordinate/equity tranche at a rate to be determined
- The asset manager enters into an interest rate swap where :
  - Pay fixed equal to Treasury + 100bp and receive LIBOR
  - Notional principal $80m
- Treasury rate at time of issue of CDO is 7%
- Annual fees (e.g. asset management fees) are $640,000
- **Calculate the return to the subordinate tranche.**

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Example 11.6.1

Cash CDO Arbitrage transactions

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Interest from collateral	$11m
Interest from swap counterparty	$80m x LIBOR
Total interest received	$11m + $80m x LIBOR
Interest to senior tranche	$80m x (LIBOR + 70bp)
Interest to mezzanine tranche	$0.9m
Interest to swap counterparty	$6.4m
Total interest paid	$7.3m + $80m x (LIBOR + 70bp)
Net interest	$3.7m – ($80m x 70bp) = $3.14m
Interest for subordinate tranche	$3.14m – 0.64m = $2.5m

Annual return to subordinate tranche equals 25% ($2.5m / $10m)

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Objective 11.6

Cash flow CDO structure

- In a cash flow CDO the objective of the asset manager is to generate cash flow (primarily from interest earned and proceeds from bonds matured, called or amortized) to repay investors in the senior and mezzanine tranches
- There are three periods in the life of a CDO:
  - Ramp-up period: The period in which the manager begins investing the proceeds from the sale of the debt obligations issued. This period is usually less than one year.
  - Reinvestment period: Principal proceeds are reinvested. Usually five years or more.
  - Repayment period: The portfolio assets are sold and the debt holders are paid off.

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Objective 11.6

Cash flow CDO structure

- Debt holders are repaid as follows:
  - Distribution of income derived from interest and from capital gains:
    - Fees to trustee, administrators and asset managers
    - Interest to senior tranches
    - If coverage tests are passed then interest is paid to mezzanine and subordinate tranches in turn
    - If coverage tests are NOT passed then principal payments are made to senior, mezzanine and subordinate tranches in turn until coverage is restored
  - Distribution of principal cash flows:
    - Fees to trustee, administrators and asset managers
    - Any shortfall in interest payable to senior tranches is made up
    - If coverage tests are passed then principal is reinvested in the reinvestment period
    - In the repayment period or if coverage tests are NOT passed then principal payments are made to senior, mezzanine and subordinate tranches in turn until coverage is restored

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Objective 11.6

Cash flow CDO structure

- Restrictions on management:
- CDOs are actively managed, where the asset manager in a cash flow CDO initially structures and then rebalances the portfolio so that interest from the pool of assets plus repaid principal is sufficient to meet the obligations of the tranches.
- For cash flow CDOs there are two types of tests:
  - Quality tests: This type of test is related to the diversity of the assets. This includes 1) a minimum asset diversity score 2) a minimum weighted average rating and 3) maturity restrictions.
  - Coverage tests: This type of test is to ensure that the performance of the collateral is sufficient to make payments to the various tranches. This includes par value tests and interest coverage ratio tests.

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Objective 11.6

Market value CDO structure

- A **market value CDO** is structured with senior and mezzanine debt tranches and a subordinate/equity tranche
- The difference between the market value CDO and the cash CDO lies in the fact that the manager of the market value CDO can sell assets in the underlying pool in order to generate proceeds for interest and repayment of principal for the holders of the senior and mezzanine debt tranches
- In contrast, the cash CDO manager is limited to the interest income and the principal redeemed or called from the collateral
- The manager of a market value CDO has greater flexibility than the manager of a cash CDO to restructure the investment portfolio

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Objective 11.6

A Synthetic CDO

- There are senior sections and junior sections in a synthetic CDO. No debt obligations are issued to fund the senior section. The junior notes are issued to fund the junior section. The key to a synthetic CDO is a credit default swap (CDS), which is conceptually similar to an insurance policy.
- In a synthetic CDO, the insurance buyer is an asset manager or institution who pays a periodic fee (like an insurance premium) and receives payment from the protection seller in the event of a "credit event" affecting any asset included in the reference asset. The notional amount of the CDS is the par value of the senior section.
- The seller of the protection is the SPV on behalf of the junior note holders. If there is a credit event (bankruptcy, failure to pay, etc), the protection buyer should be paid the difference between par and the "fair value" of the securities by the protection seller.
- The junior note holders are getting payments that come from two sources:
  - The income from the high quality securities purchased with the funds from the issuance of the junior debt obligations and
  - The insurance premium paid on the credit default swap
  - Their return is affected by any "credit event" which requires them to make a payment to the protection buyer.

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Tutorial assessment task 5 in Tutorial 11 (Next week)

- Tutorial assessment task 5 will contain 10 multiple-choice questions relating to material from Lecture 9 (Valuing bonds with embedded options) and Lecture 10 (Mortgage-backed securities)
  - Four calculation-based questions, requiring the calculation of the value of a call or put option associated with a bond, the WAC or WAM for a mortgage passthrough security, the servicing fee associated with a mortgage passthrough security, and the monthly prepayment amount or percentage rate for a passthrough security incorporating CPR and PSA benchmark criteria.
  - Six theory questions. Three questions associated with Lecture 9 material and three questions associated with Lecture 10 material.
  - In total there will be four questions from Lecture 9 and six questions from Lecture 10 material.
- Purpose of this assessment task is to help prepare you for the final examination, which will contain a section of multiple-choice questions