

Residential mortgage-backed securities

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Introduction

Introduction

Mortgage-backed securities (MBS) are :

- debt-based securities,
- the cashflows (CF) come from the payments of a "pool" of mortgages.

There are a few types of MBS:

- ABS = Asset-backed security,
- CMBS = Commercial mortgage-backed security,
- RMBS = Residential mortgage-backed security.

Residential mortgage-backed securities (RMBS) are:

- a type of MBS
- backed by the interest paid on loans for residences.

Bonds

Bonds

- fixed-income instruments,
- represent a loan made by an investor to a borrower,
- an I.O.U. (an informal document acknowledging debt) between the lender and borrower that includes the details of the loan and its payments,
- are used by companies, municipalities, states, and sovereign governments to finance projects and operations.

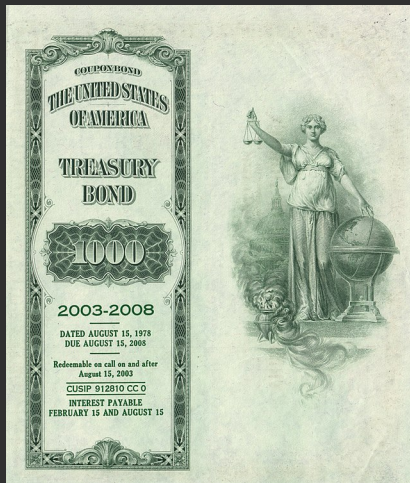


Figure: An example of a treasury bond.

Bond characteristics

- Issuer – the entity that has issued a bond or the one who borrowed money
- Bondholder - is the investor, owner of the dept who lends money to the issuer
- Maturity - the date on which the last payment is made
- Face value - the money amount the bond will be worth at maturity
- Coupon rate - is the rate of interest the bond issuer agrees to pay on the face value of the bond
- Coupon date - the dates on which the bond issuer will make interest payments
- Issue price - is the price at which the bond issuer originally sells the bonds

Bond pricing

$$PV \text{ of a bond} = \frac{PMT}{(1+r)^1} + \frac{PMT}{(1+r)^2} + \cdots + \frac{PMT + FV}{(1+r)^N},$$

where PMT = coupon payment per period,
 FV = face value the bond paid at maturity,
 r = discount rate,
 N = number of periods until maturity.

Securitization

Mortgage-backed securities

- represent an ownership interest in mortgage loans made by financial institutions to finance a borrower's purchase of a home or other real estate.
- are created when mortgage loans are packaged, or "pooled", by issuers or servicers, and securities are issued for sale to investors.
- As the underlying mortgage loans are paid off by the borrowers, the investors in the securities receive payments of interest and principal.

How securitization works

- the originator—gathers the data on the assets it would like to remove from its associated balance sheets
- This gathered group of assets is now considered a reference portfolio.
- The originator then sells the portfolio to an issuer who will create tradeable securities.

- the reference portfolio—the new, securitized financial instrument—is divided into different sections, called tranches.
- The tranches consist of the individual assets grouped by various factors, such as the type of loans, their maturity date, their interest rates, and the amount of remaining principal.
- After combining mortgages into one large portfolio, the issuer can divide the pool into smaller pieces based on each mortgage's inherent risk of default.
- These smaller portions then sell to investors, each packaged as a type of bond.

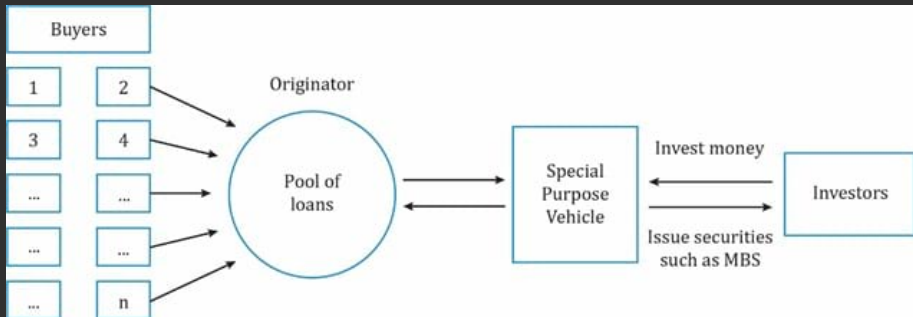


Figure: How securitization works.

We can usually divide the tranches into three categories:

- senior tranches <- higher credit rating
- mezzanine tranches (the middle tranches)
- junior tranches <- lower credit rating, first loss

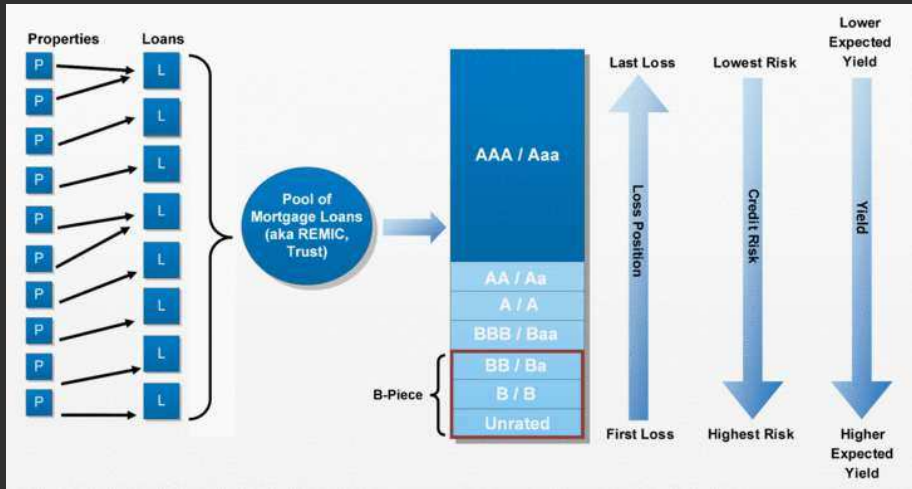


Figure: How tranches look like.

CDR or Constant Default Rate

- is the percentage of mortgages within a pool of loans in which the borrowers have fallen more than 90 days behind in making payments to their lenders;
- values losses within mortgage-backed securities
- is calculated on a monthly basis;
- is one of several measures that those investors look at in order to place a market value on an MBS,

The CDR can be expressed as a formula:

$$CDR = 1 - \left(1 - \frac{D}{NDP}\right)^N,$$

where $D =$ Amount of new default during the period,

$NDP =$ Non – defaulted pool balance at the beginning of the period,

$N =$ Number of periods per year

The recovery rate

- To protect investors from losing money on default, the security usually contains a *recovery rate*
- is the extent to which principal and accrued interest on defaulted debt can be recovered
- expressed as a percentage of face value
- the type of the instrument and its seniority affects greatly the recovery rate.

CPR or conditional prepayment rate

- is an estimate of the percentage of a loan pool's principal that is likely to be paid off prematurely.
- is calculated based on a number of factors: historical prepayment rates for previous loans similar to the ones in the pool and future economic outlooks.

The CPR can be expressed as a formula:

$$CPR = 1 - (1 - SMM)^{12},$$

where SMM = *In effect, the amount of principal on mortgage-backed securities that is prepaid in a given month.*

Thank you for your attention!