Investing with Mortgage-Backed Securities

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Basics and History

What are Mortgaged-Backed Securities?

Mortgage-Backed Securities (“**MBS**”) and Asset-Backed Securities (“**ABS**”) are types of securities packaged together or “securitized,” meaning they are created by transforming non-liquid assets into tradeable securities which provide investors with principal and interest. A collection of residential mortgages creates an MBS while a collection of other types of loans (e.g., student loans, credit cards, auto loans) creates an ABS. In an MBS or ABS, the assets are combined as collateral into a new security which can be purchased and traded by investors.

Agency MBS, which are issues by government-sponsored enterprises (“**GSEs**”), have been around since the 1970s and have grown into the second largest asset class of the US fixed income market, which is the largest and most liquid debt market behind only the U.S. Treasury market. In contrast, non-agency MBS (private-label securities) are issued by private entities, such as banks, and are not guaranteed by any GSE. Prior to that, banks kept loans on their books as part of their portfolios financed by bank deposits and their own debt obligations. With growing demand for mortgage loans after World War II, banks did not have sufficient capital to meet the increased need for mortgages. To address this higher demand for mortgage loans, GSEs (i.e., GNMA, FNMA, FHLMC) were created to securitize mortgage loans and an MBS market followed shortly thereafter. Holders of agency MBS now represent a broad and diverse group of investors and make up a large percentage of overall fixed income investments.

There are two main types of MBS: mortgage pass-through securities (“**pools**”) and collateralized mortgage obligations (“**CMOs**”).

MBS Types and Characteristics

- **Mortgage pass-through security:** Pools are a group of mortgages pooled together and “securitized” as an MBS. Ownership in this type of MBS represents a direct interest in the pool of mortgages. Monthly principal and interest payments paid by the homeowners on the underlying mortgages are passed through to the bondholders on a pro-rata basis, after the deduction of a servicing fee. These are also referred to as participation certificates (“**PCs**”). MBS can be structured as pools or CMOs, which use multiple classes (tranches) to distribute cash flows with varying maturity profiles and risk levels.

Characteristics of Mortgage Pass-Through Securities Compared

Feature	GNMA (Ginnie Mae)	FNMA (Fannie Mae)	FHLMC (Freddie Mac)
Guarantee Type	Full faith and credit of the U.S. government	GSE guarantee (but not the full faith and credit of the U.S. government)	GSE guarantee (but not the full faith and credit of the U.S. government)
Collateral	Government-insured/ guaranteed loans (i.e., FHA, VA, USDA, HUD)	Conventional conforming loans	Conventional conforming loans
Ticker Prefix	GN (GNMA I), G2 (GNMA II)	FN	FH (75-day), FR (55-day), FG (45-day Gold)
Pay Delay	GNMA I: 45-day; GNMA II: 50-day	55-day	45-day (Gold/FG), 55-day (FR), 75-day (FH)
Loan Credit Type	Government (FHA/VA insured)	Conventional	Conventional
Pool Types	Single-family, multi-family	Single-family, multi-family (DUS)	Single-family, multi-family (K-Deal®, small balance “SB deal”)

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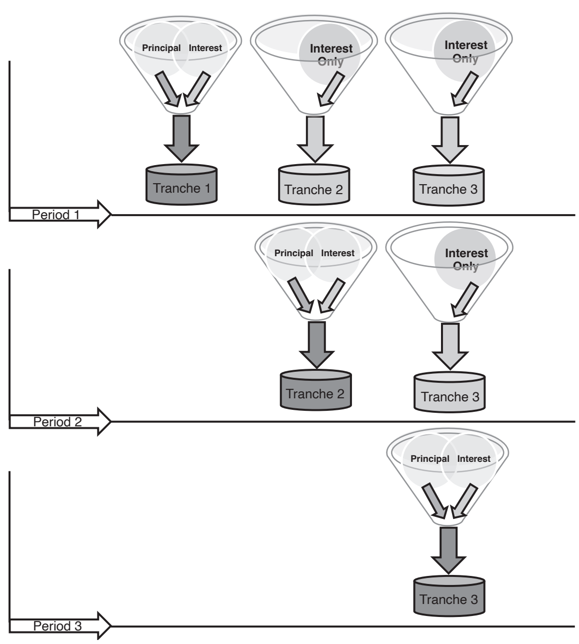
- **Collateralized Mortgage Obligation:** CMOs are a multi-class bond backed by pools of mortgage pass-through securities or mortgage loans. The CMO is structured into classes (tranches), which offer different durations and risk profiles and are designed to meet different financial objectives. Each bond in a class has a similar coupon rate, cash-flow pattern and expected maturity. The cash flow from the underlying collateral is allocated to the various classes in a pre-determined order.

  CMOs are typically issued in the form of a Real Estate Mortgage Investment Conduit ("**REMIC**") which was created from the 1986 Tax Reform Act. Most CMO bonds are now issued in REMIC form to create certain tax advantages for the issuer and investor. The terms CMO and REMIC are now used interchangeably.

CMO Class Structures

CMOs are structured to offer different opportunities to investors, with different risk and return structures. CMO tranches with the same underlying collateral may be prepaid at different rates and may have different price volatility. Some of the most common structures include, but are not limited to:

- **Sequential pay (plain vanilla):** This is the most basic CMO structure. Interest is paid to all classes each month. Principal is allocated to the first tranche until it is retired, then to the second tranche, then to the third tranche and so forth.



- **Planned Amortization Class (PAC Type I):** Within the CMO structure, this class offers the most stable average life because variation in principal prepayments are absorbed by support classes (i.e., support companion). Since PAC Type I is positioned above the lower tranches, they are less exposed to volatility.
- **Support (companion):** This class provides prepayment protection for the PAC classes. This class has an almost unpredictable average life but offers the potential for higher yields. If interest rates decline, the class will absorb all prepayment cash flows first (more call risk); if interest rates rise, the class will receive cash flows last (more extension risk). These classes can be retired if they get paid off due to prepayments.
- **Broken PAC (X-PAC):** This is a PAC whose support class(es) have been paid in full. Thus, it is no longer protected from principal prepayments and will resemble a sequential pay class.

Risks and Characteristics

While they can provide attractive yields, MBS carry risks which differ from traditional bonds, which include, but are not limited to, the following:

- **Interest Rate Risk:** As with all fixed income securities, MBS are subject to interest rate risk. In general, when interest rates increase, prices decrease and vice versa.

  In a rising interest rate environment, fixed income securities commonly see a decrease in value due to new securities being issued with high interest rates that could be more advantageous for investors to purchase. The decline in value is more pronounced in bonds with a longer duration compared to bonds with a shorter duration. The decrease in value only impacts an investment if it is sold prior to maturity. Holding the fixed income securities to maturity allows the investor to receive the repayment of principal regardless of the variation in market prices, and the investor may be able to invest coupon payments and repaid principal at higher interest rates. In a rising interest rate environment, strategies such as ladders or barbells could be used to assure reinvestment at current rates, or investing in shorter duration bonds since they are not as sensitive to rising interest rates compared to longer duration securities. In a declining interest rate environment, the market fixed income securities commonly see an increase in value due to being a more advantageous investment compared to newly issued securities with lower interest rates. This increase in value is only realized if the investment is sold prior to maturity.

  Interest rate movements have an additional impact on MBS because they affect prepayment speeds. Changing prepayment speeds cause the estimated average life to shorten or extend (i.e., creating call risk or extension risk). Changes in interest rates can impact certain tranches of CMOs and change the estimated yield and average life.

- **Prepayment and Call Risk:** This is the risk of investors having their principal returned sooner than anticipated due to declining interest rates accelerating prepayment speeds. In this case, investors may face the risk of reinvesting at lower interest rates.

If issuers have embedded call features, sinking fund provisions, or other means to redeem securities early, when interest rates fall, issuers may prepay principal more quickly than expected. When this happens, investors receive their principal back, but may have to reinvest at lower interest rates, which will result in lower returns compared to the original investment. Higher coupon MBS are more likely to be impacted by prepayment risk compared to lower coupon MBS.

- **Extension Risk:** This is the risk that the life of the security may be extended beyond expectations because rising interest rates have slowed prepayment rates.

  When interest rates rise, issuers of MBS are not incentivized to repay principal quickly and instead may repay more slowly than expected. This can cause an investor to hold the securities longer at lower interest rates, missing the opportunity to invest in higher yielding fixed income securities.

- **Credit Quality Risk:** This risk applies to non-agency MBS, which do not have government backing, such as private label CMOs. These are rated by the major credit rating agencies. An investor can lose money if the underlying loans or guarantor are unable or unwilling to meet its financial obligations.

Additional factors that should be considered by a potential MBS investor include, but are not limited to:

- **Average Life Risk:** MBS have different estimated maturities and average lives as well as diverse prepayment rates, which can lengthen or shorten the duration of the security. Investors should consider their investment horizon based on estimated average life of an MBS, which can differ significantly from the stated maturity.
- **Yield:** MBS have different yields compared to other fixed income investments and investors should consider how they differ. In general, MBS tend to have a higher yield than treasuries or investment grade corporate bonds of similar maturities to compensate for the complexity of prepayment and reinvestment risks. The yield on MBS is based on the price at which it was purchased relative to the interest rate and amount of time principal remains outstanding.
- **Structure and Guarantee:** Mortgage pass-through securities and CMOs have different structures and underlying collateral. They can be backed by different government agencies or private entities, which could vary in strength and quality. For example, mortgage pass-through securities are a pool of mortgages where investors receive principal and interest payments pro-rata, while CMOs contain pools which are structured into different tranches, each with different risks and potential returns.
- **Liquidity:** MBS trade in secondary markets, but certain tranches or types (i.e., non-agency MBS) may have lower liquidity, which can impact an investor's ability to buy or sell quickly without significantly affecting the price. This liquidity risk is heightened when markets are distressed, and liquidity can vary based on prevailing economic and market conditions.
- **Minimum Investment and Transaction Costs:** The minimum investment to purchase pools and CMOs typically ranges from $1,000 - $25,000 depending on the issuer. Investing in pools and CMOs also has transaction costs which can be in the form of the markup or markdown charged on each trade.
- **Taxes:** There are a number of tax implications related to investing in MBS. Please consult with your tax advisor about how purchasing or selling MBS impacts your specific tax situation.

Investor Considerations

Before investing in MBS, you should consult your financial professional about any questions related to MBS, their risks, and their possible impact on your investment objectives. Additionally, investors should consult their independent tax advisor when considering investments in pools and CMOs.

Below are examples of questions an investor should ask before investing in MBS:

Tranches

- What type of CMO tranche am I invested in and what are the specific risks associated with the tranche?
- What are the differences in seniority, risks, and yield in this tranche from other tranches in the same offering?

Average Life

- What is the security's estimated average life compared to the stated maturity date, and is it appropriate for my investment horizon?
- How is the average life of the security impacted if the speed of prepayments change?
- How are the security's yield and average life impacted in different rate and prepayment scenarios?

Call/Extension/Prepayment Risks

- If interest rates decrease, to what extent is the security exposed to call risk and how would returned principal be reinvested?
- If interest rates increase, to what extent is the security exposed to extension risk and what would the impact be on other potential investments and opportunities?
- Do any tranches of the CMO provide protection from prepayment risk?

Interest-Rate Sensitivity

- How do interest rate changes impact the price, estimated yield and average life of the security?
- How does the price sensitivity of the security compare to other fixed income investments with similar maturities or investment horizons?

Guarantee and Credit Quality

- Is the security backed by an agency (e.g., GNMA, FNMA, FHLMC) or a non-agency private-label entity and how does that impact my credit risk?
- If the security is agency-backed, what does the guarantee entail (e.g., principal, interest, timely payments)?
- If the security is non-agency private label backed, what is the credit rating of the tranche and the quality of the loans and structure?

Yield and Pricing

- Is the yield of the investment proportional to the prepayment and/or credit risk?
- What is the assumed prepayment structure of the security and how is the yield calculated?
- How does the security's yield compare to other fixed income investments with similar maturities or duration?

Collateral

- What is the underlying collateral of the security?
- How are the prepayment speeds and prices different in each of the CMO's respective tranche structures?
- What level of price volatility am I comfortable with for this investment?

Minimum Investment

- What is the minimum investment requirement for this security?

Liquidity

- If I need to sell the security in the secondary market prior to its maturity, how liquid is it and what is the potential price impact of selling it prior to its maturity?

Tax Implications

- What are the tax implications of investing the MBS?

Overall Investment Objectives

- Does investing in pools or CMOs support my risk tolerance, time horizon and overall diversification?
- How does investing in pools or CMOs compare overall to other fixed income investments?

Glossary of terms used in MBS investing

Accrued interest – The amount of interest accrued but not yet paid in the current accrual period.

Active tranche – The tranche in a CMO that is currently receiving principal payments.

Amortization – Liquidation of debt through installment payments rather than in one lump sum at maturity.

Average life – On an MBS, the average length of time that each principal dollar is expected to be outstanding. That expectation is based on assumption of prepayment speeds. (see also **Weighted Average Life - WAL**)

Basis point (bps) – One one-hundredth (.01) of a percentage point. Used to express changes in interest rates and bond yields. For example, a rate that increases from 2.5% to 2.75% would be a 25-basis point increase.

Bond equivalent yield (BEY) – An adjustment to an MBS yield that reflects its greater present value, created by the monthly or quarterly interest unlike most types of bonds that pay interest semiannually.

Call risk – For an MBS, the risk that declining interest rates may accelerate mortgage loan principal payments (prepays), causing the investor's principal to be returned sooner than expected.

Cap – The maximum interest rate that may be paid on a floating-rate security. For example, if the secured overnight financing rate ("**SOFR**") increases to 5.25% on a floating-rate security that resets to 100 bps off SOFR and has a 6% Cap, that security would be "capped" out and not reset higher than 6%.

CMO (Collateralized Mortgage Obligation) – A structured MBS created and "collateralized" primarily by mortgage pass- through pools. The cash flow from those pools is prioritized in different ways to create structures that broaden the choices for risk/reward, yields and maturities for investors. (see also **REMIC**)

Collateral – The property or assets pledged to the security and the source of cash flow.

Companion tranche – A CMO tranche that absorbs the cash flow unpredictability to protect the principal payment schedule for a PAC or TAC tranche in the same deal. This tranche will have a more variable average life range, and because of that risk, these tranches typically offer higher yields. (see also **Support tranche**)

Conventional mortgage loan – A mortgage loan that is not backed or insured by a government agency such as Federal Housing Administration ("**FHA**"), U.S. Department of Veterans Affairs ("**VA**"), or U.S. Department of Agriculture ("**USDA**"). These loans can be either "conforming," meaning they follow guidelines set by Fannie Mae and Freddie Mac, or "non-conforming," meaning the loans exceed such guidelines.

CPR (Constant Prepayment Rate) – The percentage of outstanding mortgage loan principal and prepayments in one year, based on an annualized Single Monthly Mortality ("**SMM**"), which reflects the outstanding mortgage loan principal that is prepaid in one month.

Current face – The current remaining principal on a mortgage security, which is calculated by multiplying the original face value of the security by the current principal balance factor.

CUSIP – Stands for "Committee on Uniform Securities Identification Procedures" and is a nine-character alphanumeric unique and uniform code that identifies North American financial securities to facilitate trading, settlement and tracking.

Delegated Underwriting and Servicing "DUS" Bonds – Fannie Mae-backed multifamily property loan MBS.

Extension risk – For MBS, the risk that rising interest rates may slow the anticipated prepayment speeds, causing investors to have their principal committed longer than expected.

Estimated Average Life – The average time principal that is anticipated to be outstanding based on anticipated prepayment rates.

Factor – A decimal value reflecting the proportion of the outstanding principal balance of a mortgage security. For example, a factor of .75 would indicate that 75% of the original balance remains and 25% has been paid down by principal payments. Factors are updated monthly as principal is paid.

Issue date – The date that the security is determined to be issued and begins to accrue interest.

Issuer – Issuers of MBS are the entities that create and sell securities backed by pools of mortgage loans. Once created, issuers are obligated to pay principal and interest on a bond.

Lockout – The period before the investor will begin receiving principal payments.

Original face – The face value or original principal amount of a security on its issue date.

PAC (Planned amortization class) tranche – A CMO tranche that has a specified prepayment schedule (much like a sinking fund on a corporate bond) giving a better-defined maturity profile. When allocating principal payment, priority is given to meeting the PAC tranche's principal schedule, with the support or companion tranches absorbing the variation in prepayments.

PAC band – Defines a range of prepayments, typically expressed in PSA rates, within which the bond should have average life stability. Also known as a PAC collar.

Plain-vanilla CMO – See Sequential-pay CMO.

Pool (Mortgage pass-through) – A fixed income security created with a pool of assets, typically mortgage loans with similar characteristics. The resulting cash flows (principal and interest) are "passed-through" from the underlying borrowers to the investors in the security. In the case of GNMA, FNMA or FHLMC mortgage pass-through securities, pools are identified by a number assigned by the issuing agency.

Prepayment – In fixed income and mortgage markets, prepayment refers to the early repayment of a loan or debt obligation – either in part or in full – before the scheduled maturity date.

PSA (Prepayment Speed Assumption) – A mortgages prepayment model used in analytics to express prepayment speeds and rate of principal return in mortgage loans.

Principal – The face amount of a bond, payable at maturity. For MBS, the amount of debt outstanding on the underlying loan. See Current face.

REMIC (Real Estate Mortgage Investment Conduit) – An investment vehicle that issues multiclass mortgage-backed securities that has certain tax and accounting advantages for both the issuers and investors. This became possible due to the Tax Reform Act of 1986. Currently, most CMOs are issued in REMIC form and the terms "REMIC" and "CMO" are used interchangeably.

Sequential-pay CMO – The most basic structure of CMO, created to broaden the range of average life and maturity choices for investors. All tranches receive regular interest payments but the principal payment from the collateral is reallocated "sequentially" to the tranches, initially to the first tranche, and once it is paid off, then to the next tranche in line. This process continues until all tranches are paid off. Also known as "plain vanilla' CMO.

Servicing – The process of collecting the monthly payments on the mortgage loans and remitting the payments to the investors of the mortgage pools that are made up of those loans. In addition, servicing includes the accounting, bookkeeping, insurance, tax records and default management involved.

Servicing fee – The amount retained by the mortgage servicer from monthly interest payments made on a mortgage loan.

SMM (Single Monthly Mortality) – The percentage of outstanding mortgage loan principal that is prepaid in one month. The annualized version of SMM is CPR.

Support tranche – See Companion tranche.

Tranche – French word for "slice" and in MBS refers to a part, segment or portion of the MBS investment trust. Each tranche offers different terms in structure and characteristics, including varying degrees of risk.

Weighted average coupon (WAC) – The average interest rate on the loans in a pool, weighted by the loan balances. The difference between the WAC and the pass-through coupon paid to the investors is called the "servicing spread."

Weighted average life (WAL) – A measure of the investment life of a fixed income security that returns principal over a period, rather than in one lump sum at maturity. It is the average time until a dollar is returned.

Weighted average loan age (WALA) – The weighted average number of months since the origination of the mortgages (i.e., the age of the loans) weighted by the size of the principal loan balances.

Weighted average maturity (WAM) – The weighted average number of months to the final payment of each loan backing an MBS weighted by the size of the principal loan balances. Also known as the weighted average remaining maturity ("**WARM**") and the weighted average remaining term ("**WART**").

Window – In a CMO security, the period between the expected first payment of principal and the expected last payment of principal.

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