

# The Investment Accountant's CMO Primer

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## Overview

This paper is intended to provide both underlying theory and practical guidance for the management of one of today's most complex security types - Collateralized Mortgage Obligations (CMOs). As a primer for the uninitiated and a refresher for the veteran, this paper can assist investment accountants in recognizing and applying the accounting guidelines that maximize compliance with firm accounting policy and regulatory requirements.

Since the largest segment of the global fixed income market is that of mortgage debt,<sup>1</sup> it is quite likely that most institutional portfolios contain securities from this market sector. To properly manage and account for CMOs, one must fully understand Mortgage-Backed Securities (MBSs), the underlying collateral of CMOs. This paper starts with a review of MBS characteristics, then examines the many principal and interest types found within popular CMO structures. With a firm understanding of the 'building blocks' of CMOs, the reader will be better prepared to comply with internal accounting policy and the requirements of the amortization methods mandated by FAS 91 and EITF 89-4.

## What is an MBS?

### *Definition*

A Mortgage-Backed Security is a marketable security ordinarily backed by a pool of residential mortgages which provide principal and interest cash flows. These cash flows are passed through to the MBS security holders (investors) on a pro-rata basis.

The MBS cash flow consists of interest, planned principal (see Exhibit 1 below), and prepaid principal. Prepaid principal is any excess loan principal paid by the mortgagees above the scheduled amount. A small percentage of the interest cash flow is retained by the pool servicer, but 100% of all mortgage principal is paid to the investors (see Exhibit 2 below).

### *Collateral Characteristics*

Since an MBS is an aggregation of many unique residential mortgage loans, it never pays down perfectly according to the loan amortization schedule. To be

<sup>1</sup> The mortgage market is estimated to have grown to over \$4 trillion in 1994.

sure, the uncertainty of the amount and timing of any excess principal payments is a complicating factor for these instruments. For example, cash flows change as mortgage interest rates change. When market interest rates go down, cash flows increase and the expected average life of the MBS shortens. This is due to mortgagees refinancing at lower market rates, or paying off their current mortgage as they trade up to buy bigger homes due to the ability to take a larger, lower rate mortgage. When interest rates rise, the inverse occurs: unexpected cash flows slow down and the expected average life of the MBS lengthens. In this scenario, it is too expensive for the mortgagee to refinance and it is likely that their existing mortgage rate is below the market rate. There is no incentive to payoff a “favorable” mortgage. Since prepayments are uncertain, their existence adds prepayment (or call) risk to the MBS security.

**Exhibit 1 • *Flow of planned (scheduled) principal assuming no prepayments***

The chart in Exhibit 1 shows the cash flows resulting from strict adherence to the original loan amortization schedule.

*Industry Gauges of Prepayment*

All in all, there is a “normal” rate of mortgage prepayments as consumers sell their homes and retire their mortgages. Typically this happens due to seasonal factors, changes in general economic conditions, and when families or individuals relocate, get divorced, or die. There are commonly accepted methods of estimating prepayment experience. The first is CPR (Constant Prepayment Rate).<sup>2</sup> It is applied in the following manner: a 6% CPR is an assumption that 6%

<sup>2</sup> CPR is also referred to as the conditional prepayment rate.



enon. While market rates fall and bond call provisions raise the probability that a bond will be called, the market price will not move much higher than the call price. Additionally, reinvestment risk is also a factor. As rates fall, the investor receives cash flows sooner than expected and can only reinvest at lower and lower rates, thereby lowering overall expected return on investment. Purchasers of premium MBS securities also recognize capital losses on the prepayments since they reflect par. Prepayments are not all bad, however. Purchasers of discount MBSs experience gains on prepayment cash flow.

When interest rates rise, the market price of the MBS will fall. But its market price falls faster than the comparable U.S. Treasury Bond. This occurs because prepayments slow down, effectively increasing the investment at the MBS coupon rate, which is lower than prevailing market rates. Investors would prefer to speed up prepayments so that the excess cash flow could be reinvested at the higher market rate. When the average life of the pool lengthens, extension risk rises.

## **Who Issues MBSs?**

### **GNMA - Ginnie Mae**

The Government National Mortgage Association (Ginnie Mae) is a wholly-owned government corporation within the Department of Housing and Urban Development. GNMA guarantees the timely payment of principal and interest on its securities. These payments are guaranteed by the full faith and credit of the U.S. Government because they are backed by pools of FHA-insured and VA-guaranteed mortgage loans.

### **FNMA - Fannie Mae**

The Federal National Mortgage Association (Fannie Mae) is a federally-chartered and privately-owned corporation created by Congress. It is authorized to buy and sell FHA-insured and VA-guaranteed mortgage loans. FNMA guarantees timely payment of principal and interest on its pass-through securities.

### **FHLMC - Freddie Mac**

The Federal Home Loan Mortgage Corporation (Freddie Mac) is a federally-chartered, stockholder-owned corporation created by Congress. FNMA guarantees timely payment of interest and ultimate payment of principal on its pass-through securities.

### **Private Pass-through**

Mortgages can also be pooled and securitized by non-government entities such as commercial banks, thrifts, and private conduits. Citibank, Prudential, and Salomon Brothers have been issuers of private label MBS deals.

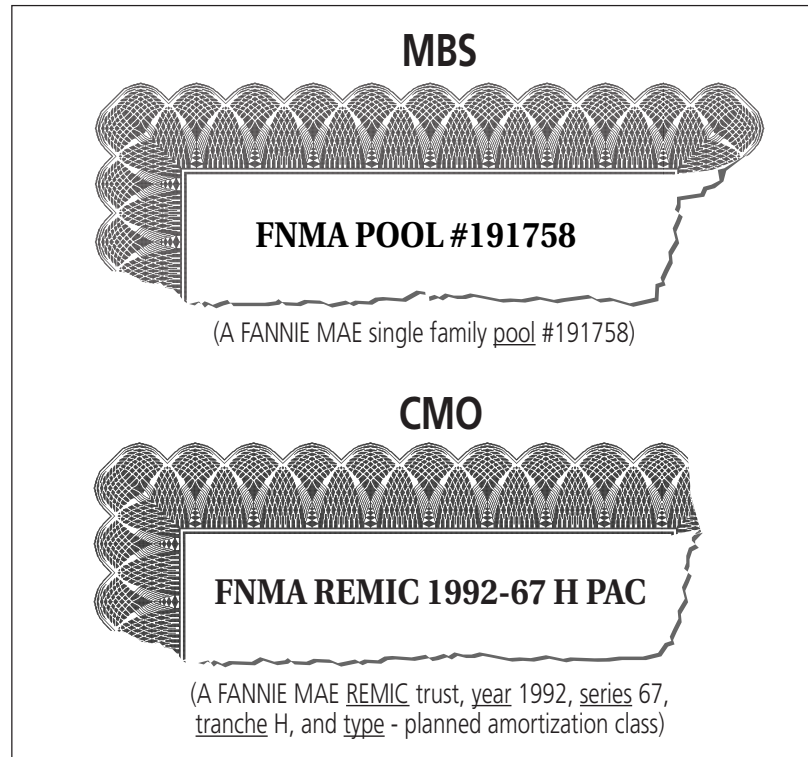






## Do We Own Any?

A simple examination of the security description can eliminate much of the mystery surrounding CMOs. If the word “POOL” is contained in the security description, it is an MBS security. If the year of issue is found or some other capitalized letters, it is likely to be a CMO.



Additionally, there are some telltale characteristics to watch for in CMOs:

- Principal pays down or up
- Paydowns are irregular
- Bloomberg classifies the security as a CMO

## Must I Read the Prospectus?

The answer is “yes” for investment organizations performing formal cash flow matching or cash flow testing for asset liability management. A sophisticated investment organization needs to know the characteristics of its assets and be able to forecast the performance of those assets given different future interest rate scenarios. To be sure, future cash flow projections are the basis of all yield calculations. So, from the perspective of compliance with statutory and GAAP accounting rules for amortization, a knowledge of the future cash flows of all investment assets is crucial. The prospectus for each REMIC pass-through cer-





lying mortgages. The TAC classes in any series may include two or more types. The different types have different principal payment priorities and have schedules that are derived from different assumed prepayment rates. In cases where there is more than one type, the TAC classes are designated as Type I TAC class, Type II TAC class, and so forth (standard abbreviations: TAC I, TAC II).

### **XAC - Index Allocation Class**

These are classes whose principal payment allocations are based on the value of an index.

### ***Interest Types***

#### **ARB - Ascending Rate**

Ascending Rate classes have predetermined class coupons that change one or more times on dates determined before issuance.

#### **EXE - Excess Residual**

The Excess Residual classes receive any principal and interest paid on the underlying pass-through certificates or other REMIC pool assets in excess of the amount of the prescribed principal and interest required to be paid on all classes in the series. Excess classes sometimes have specific principal amounts but no specific class coupon.

#### **FIX - Fixed Rate**

Fixed Rate classes contain class coupons which are fixed throughout the life of the class.

#### **FLT - Floating Rate**

Floating Rate classes have class coupons that are reset periodically based on an index and that vary directly with changes in base index.

#### **INV - Inverse Floating Rate**

This Floating Rate class contains class coupons that are reset periodically based on an index and that vary inversely with changes in the index.

#### **IO - Interest Only**

Interest Only classes receive some or all the interest payments made on the underlying pass-through certificates or other REMIC pool assets and little or no principal. Interest only classes have either a nominal or a notional principal amount. A nominal principal amount represents actual principal that will be paid on the class. It is referred to as nominal since it is extremely small com-





## FAS 91 Catch-Up Adjustment - Retrospective

FAS 91 Retrospective is a retroactive amortization method described in FAS 91, Paragraph 19, using a constant yield method. The yield is computed on estimated cash flows which include estimated future principal prepayments. Amortization is based on an assumed prepayment rate. If actual prepayments differ, a “catch-up” adjustment to book value is required. Estimates change over time and the yield is recomputed from the original basis date using actual past purchase price, actual cash flows, and newly estimated future cash flows. The current book value is restated and an adjustment is booked to record the change. This method is recommended only when the investment represents an interest in a large number of similar loans whose timing and amount of prepayments can be reasonably estimated, such as a PAC bond.

### *Example*

Assume an investor purchases \$300,000 par of a 0% coupon CMO, yielding 5%. The initial market price of \$90.77 equals the book value (\$272,324.80), which equates to a 5% yield. When cash flows are projected based on a 100 PSA, the following values are computed:

#### **Table 1**

Now assume that it is year 2. The investor received the \$100,000.00 payment of principal during year 1, but now market interest rates rise. This will cause the cash flows to extend because prepayment experience will fall. So in this simplified example, the investor forecasts \$50,000.00 per year for the next four years (see the projected cash flows in Table 2, below).

#### **Recalculate Yield**

Paying \$90.77 for \$100,000 in the first year, and receiving \$50,000 in each of the next four years, yields 3.76% instead of the original 5.0%. Retrospective looks back to the original purchase price and recalculates the amortization yield based on that purchase price, the actual cash flows, and the future projected cash flows.





**Table 2**

Exhibit 4 depicts the difference between the changes in book value due to the passage of time and the change in interest rates. Please note the increase in the expected life of the instrument due to a decrease in the prepayment experience. Also of note is the large catch-up adjustment in the last period under both scenarios. This is a typical outcome of the Retrospective method.

**Exhibit 4 • Retrospective method causes large catch-up adjustments**

**EITF 89-4 Prospective**

The Emerging Issues Task Force statement 89-4 specifies the use of the Prospective yield method for highly volatile bonds such as IOs and IOettes. The yield is computed using the current amortized value and the newly projected



**Exhibit 5 • Comparison of amortization methods - Retrospective vs. Prospective**

**Which Amortization Method Is Appropriate to Use?**

When moving from the Contractual amortization method into FAS 91 compliance and the use of Prospective and Retrospective amortization methods, the key concept is how to utilize cash flows. Under the Contractual method, the security is amortized to contractual maturity with no regard to prepayments. In other words, the actual cash flows and yields are not used to calculate amortization. In the Retrospective and Prospective amortization methods, cash flow projections and yields based on a CPR are used to amortize the bonds. These methods are truly cash flow dependent.

**How Will the Change in Methods Affect my Bonds?**

*More Rapid Amortization*

The most important thing to understand is that the amortization will no longer be projected to the longest stated maturity in a pool; instead it will be amortized over the actual and projected cash flows with a tail out to the weighted average remaining maturity (WARM). For example, an MBS with a contractual maturity of 2025 would have previously amortized its premium or discount over 30 years (essentially straight-lined), with additional amortization coming in the

form of principal prepayments. The new methods do not cause a spike in amortization with prepayments, but have greater amounts of normal amortization recognized earlier. In other words, the higher the CPR chosen for cash flow generation, the earlier amortization will be recognized. This skewing of cash flows will occur even if the CPR is not reprojected over the life of the MBS. See Exhibit 2 for a graphic display of the effect of prepayments versus the contractual retirement of principal shown in Exhibit 1.

### *Possible Fluctuation in Book Value - Retrospective*

Book value adjustments may fluctuate from accrual of discount to amortization of premium because the amortization is no longer calculated to the contractual maturity without regard for projected prepayments — it is based on internal yield calculations that take prepayments and cash flow changes into account. Under the Retrospective method, as cash flows fluctuate, the internal yield calculation can cause book value to increase or decrease. Therefore, the same bond can both accrue discount and amortize premium over its lifetime. There is an immediate change in book value due to the change in actual and projected cash flow.

### *Example of Fluctuation*

For example, consider an MBS purchased in January 1995 priced at \$99.50 to yield an effective yield to maturity of 7.85%. This yield calculation is based on the cash flows generated under an 18% CPR assumption. The Retrospective method will generate an amortization schedule based on the resultant cash flows and the original purchase yield. If cash flows do not change, the amortized value of the security will proceed forward towards par. However, a change in projected and received cash flows will cause the amortized value to deviate from the initial schedule. Amortized value may even deviate below cost or above par using the Retrospective method.

### *How the Deviation Occurs*

A deviation below cost can occur if the projected CPR falls, causing the generated cash flows to extend. Assume that the CPR drops to 6% CPR. The Retrospective method will recalculate the yield using the purchase information along with the actual and projected cash flows. The use of the newly recalculated yield to calculate the book value, along with the adjustment for previously recognized income, may force the book value outside of par/cost. In this particular example, the book value is recalculated to \$95.25, well below cost. If the opposite phenomenon occurs and cash flows shorten due to an increase in the prepayment speed, the mathematical calculation can force the amortized value above par. The direction of the movement is dependent upon the changing speed of prepayments and their effect on current cash flow projections.





- Complex structures require actual cash flows to determine accurate yields.
- Compliance with prescribed accounting treatment is assured.
- Accurate income recognition and asset valuation is assured.
- Accurate data is available for asset/liability and investment analysis.

## Summary

With recent changes in regulatory requirements, complex securities like MBSs and CMOs must be accounted for and reported with greater accuracy. The first step to achieving greater accuracy is clearly distinguishing the various security types within a portfolio. Then, careful consideration must be given to the use of the most appropriate amortization method – Retrospective or Prospective. In general, Prospective amortization is best-suited for volatile securities.

Regardless of the amortization method chosen, amortization will occur earlier and more quickly than under the FAS 91 Contractual method. Investment accountants are urged to carefully review their portfolios and plan for the impacts of these regulatory changes. With planning, full compliance with FAS 91 and EITF 89-4 is assured, and overall portfolio management will improve from the availability of more accurate cash flow information.

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