


 First Empire Securities

Our Clients ... Our First Priority


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### **MORTGAGE BACKED SECURITIES**

A Mortgage-Backed Security is created when the issuing Agency purchases a number of investment quality residential home mortgages from various banks, thrifts, or mortgage companies. These mortgages will typically have similar characteristics, such as term (i.e. all of the loans will be 30 year fixed rate mortgages), and interest rate (i.e. all of the loans will be around 8.50 %). The Agency then "pools" these home loans together, assigns a unique "pool number" to the mortgages, and issues a bond against this pool. The Agency will then sell the Mortgage-Backed Security to an investor (or investors). Every month going forward the homeowners make their monthly mortgage payment (of principal and interest) to their respective lender (the bank, thrift, or mortgage company that underwrote the mortgage). The payment is then passed through to the Agency, who then passes it through to the bondholders. Each investor receives their proportionate share of these monthly payments (i.e. if one bondholder owns 1/2 of the pool, he will receive 1/2 of all payments made each month).

### **SAFETY**

There are currently three U.S. Government Agencies that issue Mortgage-Backed Securities:

#### Government National Mortgage Association (GNMA or Ginnie Mae)

The Government National Mortgage Association is a Federal Corporation that is part of the United States Department of Housing and Urban Development. GNMA Pass-Through Securities are comprised exclusively of Federal Housing Authority (FHA) insured or Veterans Administration (VA) guaranteed mortgage loans. GNMA Pass – Through Securities are backed by the "full faith and credit of the US Government". Regardless of whether the homeowners make their mortgage payments, the bondholder is guaranteed to receive their scheduled payment of principal and interest every month in full and on time. GNMA is currently the largest issuer of Mortgage-Backed Securities.

#### Federal National Mortgage Association (FNMA or Fannie Mae)

The Federal National Mortgage Association is a publicly owned, government-sponsored corporation that was chartered by Congress in 1938. FNMA MBSs are typically made up of "conventional" mortgages (i.e. non-FHA insured or VA guaranteed). However, many FNMA pools have been issued that have FHA & VA loans in the pool. FNMA MBSs are backed by the "full faith, credit, and earning power of Fannie Mae" with the "implied backing of the Federal Government". In the general market, this difference in guarantee from GNMA is virtually indistinguishable. Market participants assume the Federal Government would not allow an entity that it created (and continues to oversee for the benefit of the public) default on one of its issues. Consequently, investors view FNMA MBSs as having virtually no credit risk. Regardless of whether the homeowners make their mortgage payments, the FNMA guarantees that the bondholder receives the scheduled payment of principal and interest in full and on time every month.

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### Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac)

The Federal Home Loan Mortgage Corporation is a publicly owned, government-sponsored corporation that was chartered by Congress in 1970. FHLMC PCs are typically made up of "conventional" mortgages (i.e. non-FHA insured or VA guaranteed). However, some FHLMC pools have been issued that have FHA & VA loans in the pool. FHLMC PCs are backed by the "full faith, credit, and earning power of Freddie Mac" with the "implied backing of the Federal Government".

As with FNMA, in the general market, this difference in guarantee from GNMA is virtually indistinguishable. Consequently, investors view FHLMC PCs as having virtually no credit risk. Regardless of whether the homeowners make their mortgage payments, the bondholder is guaranteed by FHLMC to receive their scheduled payment of principal and interest every month in full and on time.

### **CASH FLOW**

The monthly cash flow of a MBS is a direct result of the monthly mortgage payments made by the underlying homeowners. Along with the monthly interest payments, the MBS also pays some principal. This principal amount is both the regularly scheduled principal payment ("scheduled amortization") and any prepayments made by the homeowners. These unscheduled principal payments (over and above the scheduled monthly amortization) happen primarily for three reasons: Interest rates have fallen, and the homeowner chooses to refinance their mortgage at a lower rate in effect paying off the original loan; the homeowner sells the home outright and pays off the mortgage; the homeowners make some amount of payment above and beyond the scheduled payment in order to reduce their loan balance, but not paying off the loan entirely. In the cases mentioned above, the prepayment of principal is transferred from the lender to the Agency and from the Agency to the bondholder(s).

### **MATURITY**

There are three separate maturity measurements that can be applied to a specific Mortgage-Backed Security (MBS): Stated Final maturity; Weighted Average Maturity; and Weighted Average Life. The Stated Final Maturity is the last scheduled principal payment of the longest mortgage in the pool, when the pool is issued. Once this date is established, it is never changed. However, this may not be the actual last payment that the bondholder receives. If this specific homeowner prepays their mortgage at any point during the life of the loan, then this date becomes irrelevant.

A better measurement of the final maturity is known as Weighted Average Maturity ("WAM"). The WAM is the average final scheduled principal payment for all of the loans remaining in the pool at any given time. Over time, as the homeowners prepay their mortgages, the WAM will be adjusted to reflect the remaining final principal payments for the remaining loans that make up the pool.

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The best measurement of "maturity" for a MBS is known as "Weighted Average Life" (WAL or "average life"). Remember, a MBS pays some principal back to the investor every month from purchase out to the final payment. Therefore, a 30-year MBS has 360 "monthly principal maturities" as opposed to a single maturity date. Average life is in effect the "weighted average maturity" of these future monthly principal payments. Also, keep in mind that the investor will receive varying amounts of principal each month (primarily due to prepayments). Since this cash flow is dependent upon the rate of prepayments, the average life will vary as prepayments vary. If prepayments increase, the investor will be paid back more principal sooner. Therefore, the average life shortens. Conversely, if prepayments decrease, the investor gets paid back less principal up-front and more principal later and average life lengthens.

### **MEASURING PREPAYMENTS**

The two methods of measuring prepayments for MBSs are: Constant Prepayment Rate (CPR); and Public Securities Association Prepayment Model (PSA).

#### CPR

CPR is the amount of principal prepayments on a specific MBS expressed as an annualized percentage of the outstanding MBS balance. For example, if a pool of mortgages is prepaying at a rate of 5.00% CPR, then its cash flow consists of principal payments that will reduce the outstanding balance at the end of one year to 95% of what it would have been given no prepayments occurred. CPR is always expressed as an annual percentage of prepayments. Simply, 5.00% CPR would translate to mean that 5 out of every 100 homeowners in the pool will re-finance or prepay in full their mortgage over the next one-year.

#### PSA Prepayment Model

The PSA is a numerical scale that is used to measure the rate of principal prepayments on MBSs and to make assumptions on the future rate of prepayments. The PSA assumes that homeowners tend to make very little prepayments in the first several months of homeownership, make a steadily increasing amount of prepayments each month out to two-and-a-half years, and (beyond 2.5 years) prepayments continue at a constant rate over the remaining life of the pool. Specifically, the basic PSA model assumes a 0.2% annual prepayment in month 1, 0.4% annual prepayment in month 2, 0.6% prepayment in month 3, etc. The model increases prepayments by 0.2% (annualized) each month out to 30 months, and then levels out at an annualized rate of 6% prepayment per year thereafter. Logically, this prepayment pattern makes sense. A new homebuyer has typically just spent a thousand dollars in closing costs and down payment to buy their house. This new homeowner usually wants to spend some additional dollars on home improvements or new furniture etc. However, after being in their home several years, they may have gotten a promotion, or need more space, or found out they didn't really like the neighborhood. So, the basic PSA model takes these tendencies into account. The PSA prepayments are expressed as a percentage of this base model.

If a MBS has principal prepayments each month dollar for dollar and penny for penny at exactly the same rate as the model, the MBS is said to be prepaying at a rate of 100% PSA. If the prepayment cash-flows are twice the amount of the base model, then prepayments would be at 200% PSA; if they are 10 times as fast, 1000% PSA, if only half as much, 50% PSA etc. If the homeowners do not make any prepayments, the collateral is said to be paying at 0% PSA.

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### FORECASTING PREPAYMENTS

Obviously, the PSA and CPR can be used to analyze actual prepayment history on a specific pool, but more importantly, the PSA and CPR are used to analyze projected future cash-flows, average life, maturity, and yield to evaluate a specific pool prior to purchase. In order to do this, an assumption of future prepayment activity must be made. Opposed to simply guessing about future prepayments, there are three tangible sources of information that can be used to help formulate a prepayment assumption (forecast): Review the actual prepayment history of the MBS; review the prepayments histories of other similar MBSs; review the forecasts of the mortgage securities experts on Wall Street (this is often referred to as the "street assumption" or "Bloomberg Median"). These sources of prepayment history and forecasts are reviewed and then the investor applies his/her feeling about the direction of interest rates and mortgage rates, and therefore, the possibility of the homeowners wanting to refinance their mortgages. Then, a reasonable and supportable prepayment assumption can be made.

### DELAY DAYS

The monthly cash flow of principal, interest, and any principal prepayment on a Mortgage-Backed Security is a direct result of the mortgage payments made by the homeowners on the residential home loans that make up the pool. The homeowner pays the mortgage underwriter (bank, thrift, credit union, etc.), the payment is passed on to the Agency (GNMA, FNMA, or FHLMC), who issued the bond, and finally, the payment is passed through to the security holder. This process of transferring the payment takes some time and is referred to as DELAY DAYS. If the homeowners' mortgage payment is due to the lender on January 1st, the lenders' payment is due February 1st to the Agency, and the Agency's payment is due to the bond holders in mid-February.

Specifically:

- FHLMCs pay on the 15th
- FNMA's pay on the 25th
- GNMA's pay on the 15th
- GNMA ARMs pay on the 20th

For example, let's look at a FNMA MBS:

From the bond holders' points of view (for accounting purposes):

Interest Accrual:

- JAN 1 thru JAN 30---PAID FEB 25th
- FEB 1 thru FEB 30---PAID MAR 25th
- MAR 1 thru MAR 30---PAID APR 25th etc.

If settlement is January 20<sup>th</sup>, the bond buyer will pay purchase price + 19 days accrued interest. This accrued interest will be re-paid to the bondholder as part of the 30 days interest payment accrued for Jan 1st through Jan 30th, and paid to the bondholder on February 25th. \* *Note: Mortgage securities pay every month as 30 days (30/360 basis).*

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## **YIELD**

The yield to maturity ("yield") on a MBS is a combination of the stated rate of interest (the "coupon" rate), the price paid for the MBS (at face value - "PAR", below face value - "discount", or above face value - "premium") and the rate of prepayments. Some assumption is made at purchase about the future rate of prepayments. A MBS yield calculator can then calculate the "weighted average yield to maturity" (the "yield") using this cash-flow projection. However, there are no guarantees that the underlying mortgages will prepay exactly as assumed. If prepayments are significantly faster or slower than assumed, the actual yield earned will be somewhat higher or lower than expected. It is important for the MBS investor to remember:

### MBSs PURCHASED AT A DISCOUNT:

Faster prepayments increase yield and shorten average life.  
Slower prepayments decrease yield and lengthen average life.

### MBSs PURCHASED AT A PREMIUM:

Faster prepayments decrease yield and shorten average life.  
Slower prepayments increase yield and lengthen average life.

## **REGULATORY CONCERNS**

MBSs are legally authorized investments by all of the major regulatory authorities, the FDIC, OCC, and FRB for Banks, the FDIC and OTS for Thrifts, and the NCUA for Credit Unions. However, because of the unpredictability of prepayments and hence future cash flows and yield, the suitability of any particular pool must be examined on a purchase by purchase basis by each investor. Also, it is important to understand the MBSs ARE NOT MORTGAGE DERIVATIVE INVESTMENTS and ARE NOT SUBJECT TO THE REGULATORY HIGH-RISK SECURITIES TEST (the "FFIEC HRST"). The FFIEC HRST only applies to CMOs and other mortgage derivative products NOT Mortgage-Backed Securities.

## **TYPES OF MORTGAGE-BACKED SECURITIES**

### "Traditional" Fixed Rate MBSs

Currently, there are four maturities of fixed rate Mortgage-Backed Securities issued by GNMA, FNMA, and FHLMC:

30 Year Maturity (comprised of 30 year fixed rate mortgages);  
20 Year Maturity (comprised of 20 year fixed rate mortgages);  
15 Year Maturity (comprised of 15 year fixed rate mortgages); and  
10 Year maturity (comprised of 10 year fixed rate mortgages).

The only difference between these types of MBSs is the scheduled cash flows. For the shorter term MBSs, the underlying homeowners have agreed to pay off their loan over a shorter period of time. Therefore, the amortization schedule is much shorter and the scheduled monthly principal payments are much higher.

### Balloon MBSs

A Balloon Mortgage-Backed Security is exactly the same as the traditional 30 fixed rate MBS with one significant exception: All of the homeowners in a Balloon pool have agreed in their mortgage contract to repay the entire outstanding principal balance on or before one specific payment date in the future. For example, a 5 year balloon would be comprised of a number of fixed rate mortgages that pay on a 30 year amortization schedule and each homeowner has agreed to pay off their outstanding balance on or before their 60th

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mortgage payment. It is unlikely that these homeowners can suddenly afford to pay off their mortgage at some point in the future. The reality is almost all of these homeowners plan to sell their house and pay off their mortgage or re-finance their mortgage on or before the balloon payment date.

The most important fact for the Balloon investor to keep in mind is that the balloon payment is a scheduled payment in the homeowners mortgage contract. Whether the home owner sells their house, re-finances their mortgage, prepays by some other means or even if the homeowner doesn't make the balloon payment for any reason, the bondholder is guaranteed by the issuing Agency to receive the outstanding principal balance in full and on time on the balloon payment date.

#### Adjustable-rate MBSs

An Adjustable Rate MBS ("ARM") is exactly the same as the traditional 30 year MBS with one significant exception: All of the homeowners in an ARM pool have agreed in their mortgage contract to a floating (with the market) interest rate. The floating interest rate is accomplished by establishing a regularly scheduled adjustment date and identifying a specific market index rate, such as a 1 year

Treasury rate, PRIME rate, a FHLB Cost-of-Funds Index, etc. On the scheduled adjustment date, the homeowners mortgage rate will then be increased or decreased to reflect the level of interest rates at that point in time. Since the ARM investor's monthly cash flow is a direct result of the underlying homeowners mortgage payments, the investors interest rate will also "float" with the market. Currently GNMA, FNMA, and FHLMC all issue various ARM pools.

#### Other types of MBSs

In addition to the common types of Mortgage-Backed Securities mentioned above, there are several other types of MBS pools that are issued from time to time that are defined by some unique characteristic common to all of the underlying home loans. This unique characteristic that is common to all of the underlying mortgages in the pool will cause the scheduled cash flow to be somewhat different from the "normal" amortization schedule on a traditional MBS. Some examples of the more common non-traditional MBSs would be: Mobile Home MBSs (comprised exclusively of mortgages on mobile homes); Graduated Payment MBSs (comprised exclusively of mortgages with a graduated payment schedule); Relocation MBSs (comprised exclusively of relocation mortgages that have been subsidized by the homeowners employer.); and DUS Balloon MBS (A form of Balloon MBS where the underlying property is Multi-Family Housing). More importantly, the property owner has agreed in their mortgage to a substantial prepayment penalty and a prohibition against partial prepayments. These two "penalty" features substantially reduce the risk of prepayments regardless of the interest rate environment.

If presented with the opportunity to purchase one of these types of securities, an investor should do a little bit of homework and analysis about how these non-traditional MBS characteristics will influence cash flows and prepayments and then, employ the same decision making process as is used with other MBSs. As with all debt instruments, the sale prior to maturity may cause a capital gain or loss.

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