

A CASE FOR MARK-TO- MARKET RESIDENTIAL MORTGAGES

The residential mortgage market is taking a second look at mortgage pass-through securities.

by Robert J. Hartl

The residential mortgage market has expanded tremendously over the last decade-and-a-half. Although the market's annual growth rate has slowed recently, it still equals or exceeds that of any other major debt market over the past 15 years, including U.S. Treasuries. Without question, a major contributing factor for this phenomenal growth is the advent of Mortgage Backed Securities (MBS).

Also referred to as mortgage pass-through securities, the value of these instruments has increased at a much faster rate than even the overall residential mortgage market. From a bare 2.8% of outstanding residential mortgages in 1975, MBSs now account for about 42% of the overall market.¹ While MBSs have contributed to the residential mortgage market in many ways, their primary contribution to housing finance has been to turn a localized financial marketplace into a national credit market. The improvement in liquidity and market exposure has resulted in lower mortgage rates and a more efficient allocation of financial resources than otherwise would have been possible.

The development of the MBS market has not been a bed of roses. It has progressed because of agencies such as the Government National Mortgage Association, a few creative underwriters and many courageous mortgage lending institutions. Nevertheless, this market is not without problems, primarily in the prepayment risk facing investors in fixed rate MBS. While not unlike mortgage prepayment risk in general, MBS prepayment risk has received much publicity in recent years.

Mortgage Prepayment Risk

Investors in mortgages and mortgage back securities are forever in doubt on the timing and size of their cash inflows. Timing uncertainty is due to a number of factors. As market rates fall, large numbers of homeowners move aggressively to refinance their mortgages in an attempt to trim monthly payments. Others who are unable to refinance at the lower rate still make accelerated payments with funds taken from current income and/or the current lower yielding savings accounts. The extent of the prepayment movement depends on interest rate expectations, the shape of the yield curve and even the work load at mortgage lending institutions. Nevertheless, one expects to see a noticeable increase in mortgage prepayment activity when interest rates are falling.

The vagaries of turnover in the used housing market also plays havoc with the timing of mortgage prepayments. This would not be a problem if borrowers were required to maintain their loans

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after the property is sold. However, this seldom is the case. The fact that housing turnover often coincides with falling interest rates tends to magnify the prepayment problem. Accordingly, MBS investors are holders of variable maturity instruments and all the associated problems of reinvestment decision, transaction costs and income taxes.

To make timing matters worse, there is the issue of cash flow size to consider. Simply put, residential home mortgage borrowers universally are obligated for the book values of their loans in the event of prepayment. Unlike corporate debt instruments, mortgages are not burdened with prepayment penalties, i.e., call. This is quite problematical for mortgage investors during periods of falling market interest rates.

When interest rates are low, the market values of outstanding fixed income securities should rise to their discounted cash flow equivalents unless they are callable at a lower price. Such is the case with home mortgages whose prices are restricted on the upside by their book value prepayment provisions. As book value-based cash flows rise, the investor's yield falls. Unfortunately, investors seldom are able to profit during periods of rising interest rates, because most mortgagees find it in their best interests to decelerate prepayment activity. This one-way street is a potential source of trouble to MBS investors and a valuable call option for borrowers. Efforts have been made to correct the prepayment risk problem, most notably by collateralized mortgage obligations. However, the collateralized mortgage obligation medicine has not been able to cure the prepayment disease.²

There are two interest rates critical to investors in fixed rate mortgage securities: term yield and call yield. The term yield is the compound rate of interest that equates all scheduled installment payments to the purchase price of a mortgage or mortgage security. This is the promised rate of return and the figure used by investors when making investment decisions concerning fixed income securities. It is expressed mathematically as:

$$P = \frac{I}{(1+Y_t)^1} + \frac{I}{(1+Y_t)^2} + \dots + \frac{I}{(1+Y_t)^n}$$

Where: P = purchase price of mortgage security
 I = periodic installment payment
 n = time remaining to maturity
 Y_t = term yield

The call yield takes into account mortgage prepayment. The term yield differs from the call yield in that the latter is influenced by the prepayment amount (i.e., call price) and reinvestment of same in replacement mortgages. The call yield formula is written as follows:

$$P = \frac{I}{(1+Y_c)^1} + \frac{I}{(1+Y_c)^2} + \dots + \frac{C - \frac{C}{(1+r)^{n-m}}}{(1+Y_c)^m} + \dots + \frac{C - \frac{C}{(1+r)^{n-m}}}{(1+Y_c)^n} + \frac{r}{(1+Y_c)^m} + \dots + \frac{r}{(1+Y_c)^n}$$

Where: Y_c = call yield
 m = prepayment period
 C = call price
 r = reinvestment rate

As the call yield formula indicates, an investor's realized rate of return is determined by the call price (C) and reinvestment rate (r). At call prices equal to market value and subsequent reinvestment at market rates, a call yield can be produced that is equal to term yield. At any payoff price below market value, mortgage investors earn less than the term yield and vice versa. It follows that only a payoff at market value produces the all important term yield. As noted previously, however, all mortgage prepayment activity is done at book value call prices. While most MBS investors would like to earn the term yield, this is almost impossible to achieve with the way mortgage investments currently are structured.

Investors have two additional problems with prepayments: calls made at prices different from book values could generate unplanned taxable gains and losses; holders are forced into a reinvestment scenario along with its associated costs.

Mortgage prepayment at book value is no accident. The federal home lending authorities long ago required nationally chartered and/or insured lending institutions to structure residential mortgages with this provision. State regulatory bodies did likewise. As a consequence, the book value mortgage prepayment provision has become a standard feature. Thus, mortgagees have had the benefit of always knowing their payoff amount in the event a prepayment takes place. Furthermore, some borrowers have taken advantage of interest rate declines to the detriment of mortgage investors, while being subsidized by home owners who cannot avail themselves of this opportunity.

Investors And Mark-To-Market Mortgages

Mark-to-Market Mortgages (MMM) are residential home loans that are structured to be continuously and unfailingly payable at market determined values.³ Mortgages designed with the mark-to-market feature and MBSs that are comprised of such mortgages are free from prepayment risk. They may not eliminate cash flow timing uncertainty, but they will completely correct for cash flow size problems. That is, there will be no threats to a mortgage investor's "term" yield due to early mortgage redemption. As one might expect, the benefits to MBS investors of MMM are not without costs. And, herein lies the appeal of such mortgages to loan customers. Investors must be prepared to accept lower interest rates on the underlying mortgages in exchange for the reduced prepayment risk. They are also forced to forego book value prepayments that are in excess of

market values. The former sacrifice is clearly documented in the corporate bond literature.⁴ As for the latter cost, one need only cite the numerous occasions when mortgage borrowers sell their homes in an environment of high interest rates.

Therefore, the benefits of MMM to mortgage investors are two-fold. The main advantage concerns the almost complete absence of a prepayment risk, at least in terms of the all-important cash flow size issue. A subsidiary advantage is the lower transaction costs as the frequency of prepayments decline due to a lack of incentive on the part of borrowers to prepay voluntarily. Mortgage investors can be expected to reward borrowers for these benefits.

Borrower And Mark-To Market Mortgages

At least three individual groups of residential borrowers could benefit from MMM: permanent home buyers, interest rate speculators and payment sensitive borrowers.

Permanent home owners are defined here as those families who plan to live in a particular home for many years, conceivably up to and beyond the maturity of the mortgage. These individuals foresee little likelihood of forced mortgage prepayment since they have no plans to sell the house. Many have little hope for falling interest rates that would lead to refinancing. Among this group of borrowers many would be willing, if given the choice, to accept a reduced fixed interest rate in exchange for a mark-to-market clause in their loans. They would do this because the rate discount is more than adequate to offset the greater interest rate risk exposure.⁵ It is difficult to even approximate how large the rate discount might be under these circumstances, given the paucity of empirical research in this area. However, in all probability, the savings are likely to prove considerable once mortgage investors are allowed to compete for these loans. A 1% point reduction, for example, on an 11% - \$100,000 - 20-year mortgage would produce a monthly savings of \$67.16.

The second group of borrowers to benefit from the MMM are interest rate speculators. Although admittedly a small segment of the home buying market, these adventuresome individuals seek to capitalize on what they perceive to be a low interest rate environment. By taking out fixed rate, long-term mortgages, they hope to gain from rising market rates. The gain would show up as an increase in market determined net worth. Whether this is a financial strategy that individuals should embark upon is not clear. The fact remains, however, that a truly free financial market should provide this possibility.

The final group of interested parties consists of payment sensitive borrowers. A commonly held, though seldom tested, hypothesis states that many, if not most, consumer borrowers focus on monthly payments as opposed to interest rates. Such people are cash flow-oriented rather than net worth-oriented. If this is true, then a further case is made for MMM. Simply stated, MMM permits a payment

sensitive home buyer the luxury of knowing that his monthly loan payments will not be affected by interest rate movements no matter how many changes of residence occur over time. Take, for example, the case of a person who purchased a home for \$100,000 in 1985 under the following terms: zero down payment, 25-year maturity, 10% interest rate and a monthly payment of \$908.71. Let's assume that the home is sold in 1990 for \$100,000 at a time when equivalent market rates are 12%. The MMM payoff would amount to \$82,528 (as opposed to a book value of \$94,167). Should this individual acquire a replacement home for \$100,000, the original monthly payment does not have to change. By combining the \$17,472 equity from the old home sale (\$100,000-\$82,528) with a new 12%, 20-year mortgage of \$82,528, the monthly payment can remain at \$908.17. Thus, even though the cost of the financing is greater for the second home, this individual's monthly payments are unaltered. Should market rates become lower in 1990, the financial situation may be reversed, but the results would be the same (i.e., an inflated loan is exactly offset by a lower interest rate).⁶

Conclusion

An elimination of the prepayment privilege is not being called for here. Nor does the author want to see all residential mortgages structured with a mark-to-market feature. The goal simply is to free-up mortgage lenders so they voluntarily offer MMM to their customers along with the standard mortgage.

NOTES

1. Federal Reserve Bulletin, Board of Governors of the Federal Reserve System, Washington, D.C., 1993.
2. Roll, Richard, "Collateralized Mortgage Obligations: Characteristics, History, Analysis," *Mortgage-Backed Securities: Applications and Research*. (Chicago, IL: Probus Publishing 1987).
3. Market valuation will not be perfect since a proxy must be used for the market interest rate such as the published GNMA series.
4. Jen, Frank C., and James E. Wert. "The Value of the Deferred Call Privilege." *The National Banking Review*, March 1966, pp. 269-78.
Jen, Frank C., and James E. Wert. "The Effect of Call Risk on Corporate Bond Yields." *Journal of Finance*, December 1967, pp. 637-51.
Jen, Frank C., and James E. Wert. "The Deferred Call Provision and Corporate Bond Yields." *Journal of Financial and Quantitative Analysis*, June 1968, pp. 157-69.
5. Interest rate risk in the context of an individual's particular financial asset-liability duration exposure.
6. Of necessity, the preceding illustrations assumed zero transaction costs, constant home prices, and zero downpayments. However, if one were to relax these assumptions, the basic proposition would not be materially affected.