

## **Yield and Profitability Measures of a Real Estate Investment Trust**

A very popular investment vehicle in the last few years has been that of a Mortgage Real Estate Investment Trust (“M-REIT”). A very favorable operating environment has led to the proliferation of M-REITs, each employing a different strategy to enhance shareholder returns. Here we will show that REIT rules affect the traditional yield and profitability measures in a straightforward manner that depends on the type of strategy employed by each company. Proper attention should be paid to this yield adjustment if one is to arrive at unbiased conclusions about relative valuations amongst M-REITs.

An M-REIT utilizes capital raised in an IPO to purchase mortgage backed securities (“MBS”) and then uses these securities as collateral to borrow money which is invested in more MBS, which are used as collateral ... and so on. The amount of borrowings divided by the book value (Assets-Liabilities) of an M-REIT is the leverage. Typical M-REIT leverage values range from 8x to 12x (times the book value).

To qualify as a REIT the company should meet certain tests detailed in the Revenue Code among which, central for our discussion is the requirement to distribute 90% of the company’s annual taxable income as dividends to its shareholders. The fact that a REIT distributes almost all (for the purpose of this discussion we assume all) of its income, means that there is no reinvestment component to the yield of the asset. This can lead to substantial overestimation of the spread (and therefore the profitability) in certain market environments, magnified by the leverage the company is using.

M-REITs produce positive earnings per share (“EPS”) by accepting one or more of the following risks: yield curve, negative convexity, prepayment model and credit risk. For each risk a reward is offered that depends on market conditions. Both the reward and the risk are magnified via the leverage employed. Although the different risks are quantified by several measures such as: effective duration and convexity, prepayment and volatility durations, partial durations, spread volatility and so forth, the reward part is usually encapsulated by one measure, the yield of the security, or the spread over a similar average life U.S. Treasury. Even though it comes in many flavors, such as yield to maturity, yield to call, Z spread,

Option Adjusted Spread (“OAS”), the basic assumptions are the same in all of these computations. A price is paid for a security and in return one receives a future stream of cash flows in the form of interest and (scheduled and unscheduled) prepayments, which in turn are reinvested into the same security (or one with the same yield) until maturity. The discount factor that makes the present value of these (potentially unknown for MBS) cash flows equal to the price paid is the yield of the security. Since MBS cash flows are influenced by a host of factors related to interest rates, one can either make a best guess for the cash flows of the security, which collectively translates into a market cash flow projection, which then provides all the static yield and spread measures. More sophisticated methodologies utilize no-arbitrage models to generate future paths of interest rates, along with MBS prepayment models which value the embedded options in MBS and produce an OAS.

The yield of a REIT’s assets minus its liability interest rate is the spread on the assets and is utilized by the management and analysts to make forecasts about the profitability of the company. The asset yield used in the spread calculations is the market quoted yield for the asset(s) in question. Regardless of the complexity of the yield or spread calculation, the assumption of reinvestment of interest income is always present. If everyone was a REIT (or some strange law prevented the reinvestment of coupons), then the reinvestment assumption would not be present. Since not everyone is a REIT, the yield realized by a REIT will be less than the quoted yield since the interest income reinvestment is absent. Let us call this difference between the quoted and realized yields the reinvestment yield (“RY”).

### **Reinvestment Yield Computation**

To calculate RY let us start with a bond of N periods to maturity and coupon c, with a quoted yield y. The foregone cash flow from each coupon payment i periods before maturity at the bond’s maturity is:  $c(1+y)^i - c$ . So the total is:

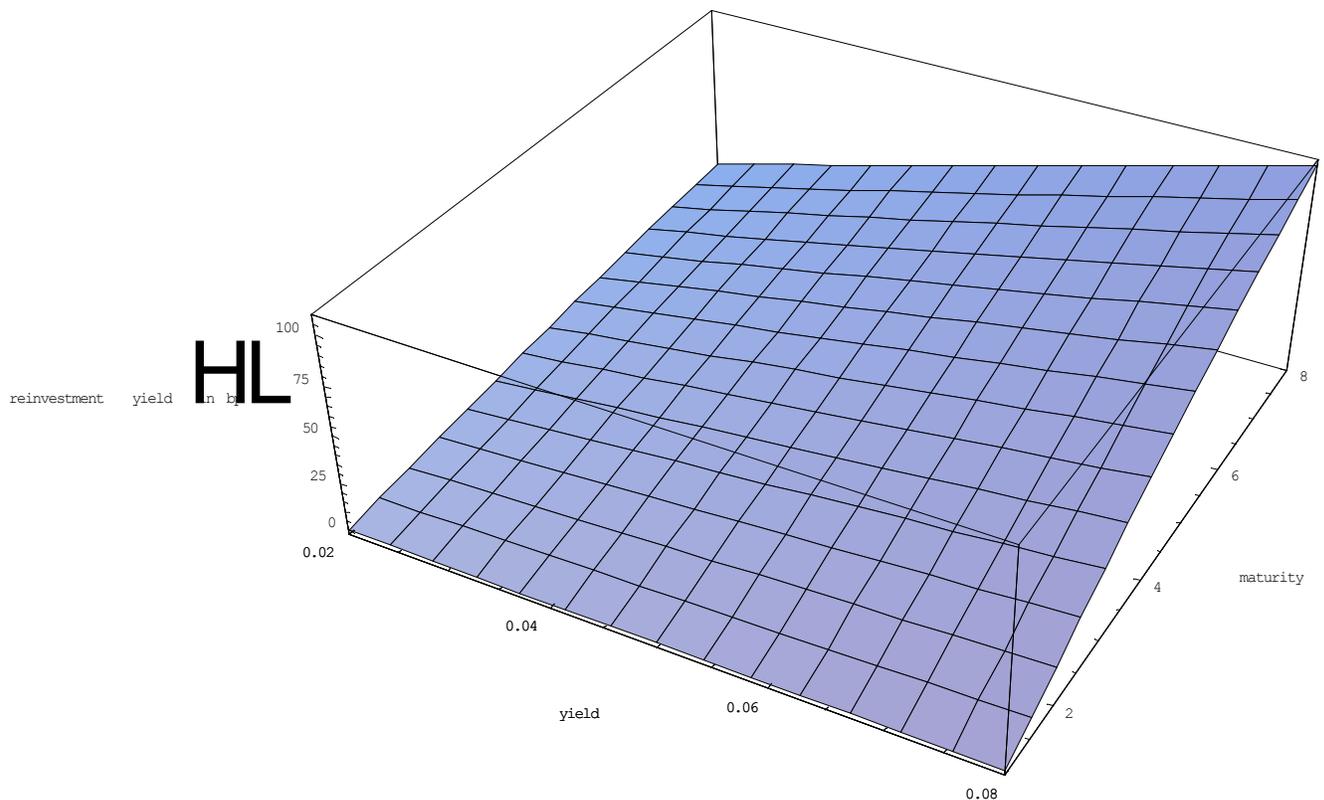
$$c \sum_{i=1}^{N-1} (1+y)^i - (N-1)c$$

Nothing is lost from lack of reinvestment of the last coupon payment on the maturity date. The present value is obtained by dividing by  $(1+y)^N$ . Evaluating the sum and using  $Y$  for  $(1+y)$  we obtain:

$$\text{Price\_of\_Reinvestment\_Component} = \frac{c}{Y^N} \left( \frac{Y^N - Y}{Y - 1} - (N - 1) \right)$$

Expressing the above as a percent of the security price and amortizing over the life of the security produces the RY.

The RY as a function of  $y$  and  $N$  is shown below, for  $c=5\%$ .



Clearly, the RY is more pronounced for high yield environments, as well as for longer maturity securities.

## **Implications and recommendations**

For REITs that employ short duration assets, the RY can be minimal, especially in today's low rate environment. For a 4% coupon security with a market yield of 3% and 2 year average life, the RY is about 10 basis points per annum. So, for a REIT employing this strategy the realized yield would be lower by 10 basis points, reducing the spread by the same amount, and with a leverage of 10 (the mid range of a typical REIT), the return on equity (or return on book) would be lower by 1.1% (10 basis points times the 10 times leverage, plus 10 basis points for the equity component).

When a REIT employs a strategy of purchasing long assets and hedging them with long liabilities the difference is much higher. For example, purchasing a 5% fixed rate MBS, yielding about 5.25% and with an average life of about 8 years, the RY is about 70 basis points. So the fact that such a REIT will pay all coupon income out and miss on the reinvestment, will reduce the realized spread by 70 basis points and the return on equity will be lower by 7.7%. Careful consideration to the magnitude of RY should be given when purchasing a REIT that employs a longer asset strategy.

Strategies that utilize high coupons and/or longer maturities are more susceptible to the lost RY. Also a high interest rate environment makes the RY higher.

On the liability side, for borrowings which are longer than one year (borrowings less than one year pay interest once and therefore, there is no loss of "re-borrowing") and are quoted on a bond equivalent basis and have periodic cleanups (i.e. interest accrued is paid out on a monthly or quarterly basis and not added to principal), the same arguments can be made. The realized liability rate will tend to be less than the quoted one, offsetting some of the spread reduction from the asset side. However, since liabilities tend to be shorter than the assets used as collateral and often times they can accrue interest until maturity, the impact of the lost RY is not as much as that on the assets, and is highly dependent on the funding strategy used.

Of course, one can argue that, upon receipt of the dividend, an investor can then turn around and return it to the company via a dividend reinvestment ("DRIP") plan, for the company to reinvest. If all investors did that, then the

RY would be captured and the traditional market quoted yield measures would be sufficient for the analysis of the company's profitability, adjusted of course for the additional shares issued by the DRIP plan.

A cash flow based analysis is the most capable of addressing the RY issue. The cash flows of each security are generated, based on model assumptions about prepayment speeds. The paydowns are then reinvested, and the interest income is paid out as dividend. Such an analysis though, necessitates detailed knowledge of an M-REIT's holdings, as well as a sophisticated analytics tool. One would assume that internal risk managers and management utilize this type of analysis when making EPS projections.

Analysts should scrutinize the type of strategy each REIT employs, its impact on the realized yield, and the amount of each company's DRIP plan as a percent of the dividend amount. It is only after incorporating all these factors in the analysis that one can make unbiased profitability projections and conduct relative value analysis amongst the number of M-REITs that are public.