

Topic of the Month: MSR HPA Sensitivity Analysis – Part 1

An excerpt from Compass Analytics August 2009 Month in Review

In this and next month's Topic of the Month, we will address the impact that property valuation methods and forecasting have on valuing mortgage servicing rights (MSRs).

First, a quick primer on MSRs: After most residential mortgages are originated, multiple entities retain interest and obligations in the mortgage. The borrower has to repay the loan, the owner of the mortgage or mortgage bond (investor) is expecting principal and interest, a mortgage insurance entity (e.g. Fannie Mae) may be involved to insure return of principal to the investor and finally an entity exists that facilitates the collection of payments (or default procedures in absence of payments) from the borrower and disbursements to insurers, investors, taxing authorities and insurers. Although the distinctions below also apply to investors and insurers, our focus in this and the next segment will be on that final entity, the mortgage servicer who has invested in MSRs.


Servicers earn servicing fees for their efforts. With few exceptions, the fee servicers earn is rate based, i.e. part of the interest rate (e.g. .25%) that a borrower pays on his/her mortgage. Servicers earn servicing fees as long as the mortgage exists and the borrower is making his/her payments. More formally, the servicer's economics (or present value of a single loan's MSR) can be expressed as follows:

$$PV_{MSR} = \sum \{CF_i / (1 + r/12)^i\} ; i = 1 \text{ to } N$$

Where i is the number of the monthly payment, N is last expected payment of loan, r is the expected annual rate of return on the MSR investment and CF_i is the net monthly cash flow the servicer receives. CF_i includes monthly servicing fees, interest earned on payment balances maintained by the servicer, interest expenses on advances made on behalf of the borrower and the expenses associated with servicing the mortgage which increase with collection and foreclosure operations.

In looking closely at the PV function components we see several areas that are likely to be impacted by future housing values (HPA). In order of importance, we see that N , the number of payments (CF_i) the MSR investor actually receives, will be impacted by HPA if a HPA forecast accelerates or decelerates expected prepayments (N). We expect servicer costs and interest expense on advances to go up with greater payment defaults that typically come with depreciating property values (CF_i will be lower). And we reasonably expect that the interest a servicer will earn on borrower balances such as property tax and insurance will be impacted by HPA to the extent property taxes and insurance payments move with property values.

Similar to whole loans, MSRs are valued by models that apply an analyst's assumptions to specific loans or groups of loans in order to model cash flows that are then discounted to derive present value. These models include prepayment, interest earnings and expenses and servicer cost models that implicitly or explicitly bake in a specific HPA forecast(s). Analysts who wish to measure the HPA sensitivity of their MSR asset need to identify what HPA forecast is already being employed in model assumptions and then measure the asset's sensitivity to different HPA forecasts. To accomplish the latter, analysts must first develop the methodology by which model

The background of the page is a blue-tinted image of a compass and a map. The compass is in the foreground, and the map is in the background, both slightly out of focus.

Compass Analytics | 4040 Civic Center Drive, Suite 450 | San Rafael, CA 94903 | www.compass-analytics.com

variables are expected to be impacted by different HPA forecasts. For example, if the baseline HPA forecast is 5% per annum, how does the analyst model the impact that a 10% HPA forecast would have on prepayments, delinquency and defaults, property taxes and insurance? In other words, how does the analyst take different HPA inputs and implement those inputs in the relevant models that drive the cash flows of the PV function?

In next month's piece, we will provide some of these answers and with the help of Compass's MSR cash flow model (CompassPoint™) demonstrate methodology to convert HPA scenarios into cash flow model adjustors and observe the associated MSR sensitivity to HPA forecasts. *—Rob Kessel*

This article was originally written for Radar Logic's monthly newsletter, to see the newsletter in its entirety, please visit www.radarlogic.com.