



SOCIETY OF ACTUARIES

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What about the 5% rate shifts that New York wants analyzed? Personally, I believe that shifts that large are almost irrelevant. If 30-year mortgages, currently at about 7.25%, fall to 4.25%, and there are people not motivated enough, smart enough, or able enough to refinance, will another 1% or 2% help? Maybe a little, but not much. Some people never refinance under any circumstances, but for those who do, the overwhelming majority of people who are inclined to refinance will not wait for a four- or five-point drop. Thus the scenarios that require analysis of 5% interest rate shifts create a lot of extra analytical work for very little added information.

The regulatory requirements were intended to reduce risk in investment portfolios. Ironically, in some cases, they actually create the exact opposite result. Many investment managers choose to avoid CMOs in order to avoid the required analytics. They then turn to lower-rated corporate bonds to obtain the required return on investment, thus increasing risk.

We have been able to supply CMO stress tests conforming to the Federal Financial Institution Examination Council (FFIEC) as required by the Financial Accounting Standards Board (FASB) for banks. Related projected cash flows are also readily available. The seven scenarios used by banks include constant, up 1%, 2%, and 3% and down 1%, 2%, and 3%. FASB has determined that banks should be managed by bankers, not by regulators. As a consequence, although the FFIEC stress tests will remain available as a tool, the FFIEC is working toward eliminating its usage as a regulatory requirement. Current projections of the effective date are approximately June 1998. It is time for the New York commission to do the same for the more complex, convoluted, notorious New York Seven. CMOs provide high yield with high safety of principal and interest. It is time that the small insurance companies be relieved of the extra financial burden imposed by the state.

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by Anson J. Glacy

Confronting CMOs at Small Insurers

Much has been written in the financial press and the everyday media recently about the dangers of derivatives instruments in general and collateralized mortgage obligations (CMOs) in particular. CMOs are assets whose returns are based on pools of mortgages or mortgage-backed securities (MBSs). The recent decline in market interest rates has spurred a new wave of homeowner refinancings, exposing CMO investors to substantial market risk. For small insurers, CMOs pose special difficulties, especially in the areas of asset adequacy analysis and asset/liability work. The complexities associated with modeling these assets can hinder the cash-flow-testing process and compromise the credibility of its conclusions. This article briefly describes the nature and features of CMOs, identifies their key risk factors, and suggests some steps small insurers can take to effectively and economically model them.

The Nature and Risks of CMOs

From the standpoint of the investing insurance company, MBSs are particularly desirable because of attractive credit-risk characteristics, good liquidity arising from a large secondary market, ease of access to the mortgage financing marketplace, and favorable risk-based capital treatment. Government agencies (such as the Government National Mortgage Association, the Federal National Mortgage Association, and the Federal Home Loan Mortgage Corporation) package, issue, and guarantee the vast majority of MBSs. CMOs alter the basic pro-rata nature of how MBSs return principal and interest by channeling returns into *tranches* (the French word for *slice*). The timing and amount of cash flows are based on the priority of individual tranches within the overall structure. For example, a CMO deal might include a *planned amortization class* (PAC) and a *support* (or *companion*) tranche (see Table 1 on page 11 for a

brief taxonomy of some commonly encountered tranche types). In order to achieve the planned amortization schedule in the PAC tranche, any excess or shortfall in prepayments must first be absorbed by the support tranche. As a result, while the PAC tranche has relatively low prepayment risk, the support tranche is fraught with it.

The Challenge for Small Insurers

How can small companies successfully deal with such complex instruments? A number of vendors (for example, Capital Management Sciences, Global Advanced Technology Corp., and Intex Solutions, Inc.) offer sophisticated database packages that handle the complex rules that govern the distribution of cash flows to the individual tranches. Unfortunately, the price of these packages usually puts them out of the reach of most small insurers. However, there are a variety of expeditious approaches that can be used to successfully model CMOs on an economic basis.

Service Bureaus

A number of reputable service organizations (such as Ernst & Young LLP) will act in a "service bureau" capacity to model specific CMO holdings for cash-flow testing or other risk assessment exercises. These service bureaus typically are licensed users of the database packages mentioned above, and this approach constitutes a cost-effective way of gaining access to the power and rigor of these packages. For example, a small insurer using the PTS® software as its modeling platform would transmit to the service bureau a CUSIP-by-CUSIP listing of its CMO holdings. Then, using the Valuation Data File (VDF) facility of PTS®, the service bureau would deliver electronic files of aggregated portfolio projections to the insurer that easily integrate into its PTS® business models. The TAS Tillinghast Actuarial Software™ permits similar functionality

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through its externally projected assets (EPA) facility.

Service bureaus also can be valuable advisors to the small insurer on CMO-related modeling issues, assumptions, and settings. For example, they can assist in reviewing and interpreting complicated CMO prospectuses, establishing prepayment assumptions, and addressing the particular modeling challenges of some of the more exotic tranche types.

Synthetic Asset Approach

CMOs are complex assets, highly dependent on marketplace interest rate movements and homeowner refinancing activity. However, if armed with some basic analytics of the CMOs at hand, the small insurer can successfully construct synthetic assets that effectively simulate the performance of the CMOs. For example, the well-known analytics of *duration* and *convexity* succinctly capture a CMO's sensitivity to interest rate movements (although some tranches like IOs can be notoriously unstationary in this respect). If computed correctly, these analytics also reflect underlying homeowner refinancings, as this activity is closely linked to changes in interest rates. Using its own modeling platform, the small insurer might then construct a synthetic asset with similar duration and convexity analytics. This synthetic asset would also match other important characteristics of the CMO (for example, coupon rate, average life). A suitably configured callable sinking-fund bond is the typical choice for such proxy service.

External Sources

Firms with which the small insurer has business relationships can also assist with its CMO challenge. For example, either the insurer's external investment adviser or the CMO dealer quite often possesses advanced asset modeling systems (for example, GAT Decision™), which these firms might employ for the benefit of the insurer. In addition, a number of Internet-based services are appearing that offer valuable pricing information and market data to the small insurer at an economical cost. Some of these worth investigating are:

- Bond Market Gateway at <http://www.psa.com/investor.htm>
- Quote.Com at <http://www.quote.com/>

TABLE 1
A CMO Taxonomy

Planned Amortization Class (PAC)	Tranche that pays principal and interest according to a predetermined schedule. PACs usually have priority over other tranches and are generally the safest.
Targeted Amortization Class (TAC)	Tranche that pays principal and interest according to a predetermined schedule but with less predictability than a PAC.
Very Accurately Defined Maturity (VADM)	Tranche having a precise maturity date.
Companion or Support Bonds (SUP)	Tranche supporting defined amortization tranches such as TACs and PACs. Payment of principal is subordinated to other tranches.
PAC II Bond	Companion bond supported by its own companion or support tranche.
Sequential Payment Bond (SEQ)	Tranche receiving principal payments after a previous tranche has been retired.
Principal-Only Bond (PO)	Tranche receiving only the principal portion of the mortgage's cash flow.
Interest-Only Bond (IO)	Tranche receiving only the interest portion of the mortgage's cash flow.
Floating Rate CMOs	Tranches whose yields depend on LIBOR. Examples are floaters (float directly with LIBOR), super-floaters (float directly but in some multiple of changes in LIBOR), and inverse floaters (float inversely to LIBOR).
Residual	Tranche that receives cash flow left after all other tranches and administrative costs have been paid.
Z Bond	Accrual or accretion tranche that pays no interest or principal until all previous tranches have been paid (except for any payments due to residuals). Interest accrues and principal payments usually begin 10 to 15 years after the CMO is issued.
Jump Z Bond	Z bond that can be converted to an interest-paying bond earlier than normally under certain specified conditions.

- Bonds Online at <http://www.bondsonline.com/>
- BondTrac at <http://www.bondtrac.com/>
- CMS BondVu at <http://www.bondvu.com/>

Finally, the venerable Bloomberg offers a portfolio cash-flow facility (PCF < GO >) that projects expected interest and principal from a CMO. Many small insurers find they can easily gain access

to a Bloomberg terminal. In addition, Bloomberg functions are now available directly through the World Wide Web, which might put them within reach of small insurers.

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