



SOCIETY OF ACTUARIES

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# Duration matching: Does it take us where we want to go?

by Yuan Chang

**T**he concept of duration matching has been and will continue to be very valuable in fashioning tools for asset/liability management.

Unfortunately, too many practitioners believe that the investment process is well managed if asset and liability durations are well matched. Indeed, some may even think that the duration matching framework is all there is to asset/liability management.

Except for special situations, duration matching performs poorly as the predominant investment strategy. Yet, it has taken the role of a framework in many financial institutions, subverting other critical issues that are important to the formulation of a comprehensive investment strategy. Communication between those responsible for assets and those responsible for liabilities centers on duration matching. The premise underlying most investment discussions seems to be: All is well if we communicate how duration matching might be achieved.

## What are the implications?

Some investment professionals believe that value is added by diversifying within the confines of fixed income securities. The duration matching framework provides no guideline that helps to determine the "right" asset allocation for managing assets. Asset allocation that exists in the marketplace has often been used as a substitute, adjusted only for the liability duration. The actual

portfolio is then managed by monitoring deviations from a theoretical portfolio as if it were the ideal portfolio.

How does this process enhance investment return? The answer is: it does not. Duration matching is a formidable constraint. For one thing, fixed income securities of any genre might be favored solely because they fit this framework. Equity investment, on the other hand, is a misfit because it defies any reasonable definition of duration. High yield coupon assets are treated as if the cash flow were level. Bonds subject to call are not managed differently from those that are not.

The duration matching framework becomes particularly dangerous when mortgage-backed securities are part of the portfolio. Management by duration matching amounts to a buy high, sell low strategy. If any asset class needs active management, this is it. An appropriate set of guidelines for the active management of this class of assets should certainly not require matching durations.

While the duration matching framework is not intended to provide return, it does not even do an effective job of managing risk. In the first place, it never was intended to address risks other than that from interest rate changes. Even here, duration matching has its shortcomings. Duration matching is premised upon parallel shifts in the yield curve, which is a rare occurrence.

Negative convexity is a technical term describing the phenomenon that changing interest rates result in changing durations in the same direction, where the asset loses value against the liability when the interest rate changes in either direction. As seen in mortgage-backed securities, the phenomenon is commonly associated with the existence of optional features. The requirement of matching durations where negative convexity exists is counter-productive. Even if assets with high negative convexity are excluded, many common liabilities also have optional features. The prevalence of negative convexity is exacerbated by the paucity of assets in the marketplace that have durations as long as those of liabilities.

When duration matching is the primary framework for the investment process, it leads to a suboptimal, if not just plain wrong, choice of asset mix. However, the current practice persists, perhaps for the lack of a more viable framework. Actuaries must take a more active role, communicating their concerns and interest to management. Let us return to basics and find a better way. There must be a better way.

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## SOA continuing education calendar

November 11-12	Asset Liability Management	Scottsdale Hilton Resort & Villas, Scottsdale, Arizona
November 17-19	Critical Issues in Underwriting	Mariott's Reach Resort, Key West, Florida
November 21-22	The Empirical and Theoretical Foundations of Interest Rate Models	Washington National Airport Hilton, Arlington, Virginia
December 11-12	The Empirical and Theoretical Foundations of Interest Rate Models	Atlanta Airport Hilton & Towers, Atlanta, Georgia
December 16-17	Actuarial and Financial Modeling — Towards a New Science	Georgia State University, Atlanta, Georgia