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Yield-factor volatility models

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Abstract

The term structure of interest rates is often summarized using a handful of yield factors that capture shifts in the shape of the yield curve. In this paper, we develop a comprehensive model for volatility dynamics in the level, slope, and curvature of the yield curve that simultaneously includes level and GARCH effects along with regime shifts. We show that the level of the short rate is useful in modeling the volatility of the three yield factors and that there are significant GARCH effects present even after including a level effect. Further, we find that allowing for regime shifts in the factor volatilities dramatically improves the model's fit and strengthens the level effect. We also show that a regime-switching model with level and GARCH effects provides the best out-of-sample forecasting performance of yield volatility. We argue that the auxiliary models often used to estimate term structure models with simulation-based estimation techniques should be consistent with the main features of the yield curve that are identified by our model.

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1. Introduction

The term structure of interest rates is often summarized using a handful of yield factors that capture shifts in the shape of the yield curve, i.e., changes in the overall level, slope,

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