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Simple Joint Macroeconomic and Term-Structure Models

The primary objective of this paper is to compare a variety of joint models of the term structure of interest rates and the macroeconomy. To this end, we consider six alternative approaches. Three of these models follow from the work of Diebold and Li (2003) with a generalization in Bolder (2006). The fourth model is a regression-based approach motivated entirely by empirical considerations. The fifth model follows from the seminal work of Ang and Piazzesi (2003), who suggest a joint macro-finance model in a discrete-time affine setting. The final model, which we term an observed-affine model, represents an adjustment to the Ang–Piazzesi model that essentially relaxes restrictions on the state-variable dynamics by making them observable. The observed-affine model is similar in spirit to work by Colin–Dufresne, Goldstein, and Jones (2005) and Cochrane and Piazzesi (2006). Using monthly Canadian data from 1973 to 2005, we compare each of these models in terms of their out-of-sample ability to forecast the transition density of zero-coupon rates. We also examine a simple approach aimed at permitting a subset of the parameters in the non-affine models to vary over time. We find, similar to Bolder (2006), that the Diebold and Li (2003) motivated approaches provide the most appealing modelling alternative across our different comparison criteria.