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DYNAMIC DERIVATIVE STRATEGIES WITH STOCHASTIC INTEREST RATES AND MODEL UNCERTAINTY

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Abstract. We obtain a closed-form solution to the investment problem of an ambiguity averse investor in complete and incomplete markets with stochastic changes in volatility and interest rates. The investor can have different levels of uncertainty about the dynamics of stock price, interest rates, and stock price volatility. We employ the Continuum-Generalized Method of Moments to estimate the model parameters based on S&P500 and 10-year Treasury bond prices data. Most importantly, we demonstrate the relevance of modelling ambiguity jointly, instead of modelling it separately for each variable. In addition, we find that in the incomplete markets bond investment is quite sensitive to the interest rate ambiguity, whereas volatility ambiguity does not have any substantial effect on the optimal portfolio. Welfare loss analysis reveals that ignoring volatility ambiguity can be very costly in complete markets and ignoring interest rate ambiguity results in somewhat significant and similar losses in both types of market.

Keywords: Robust portfolio choice, Ambiguity, Stochastic volatility, Stochastic interest rates, Welfare loss

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