

Pricing of Discount Bonds with a Markov Switching Regime*

Robert J. Elliott[†] and Katsumasa Nishide[‡]

(March 8, 2012)

Abstract. We introduce a Markov switching regime and price a discount bond using two popular models for the short rate, the Vasicek- and CIR-dynamics. In both cases, an explicit formula is obtained for the bond price which includes the solution of a matrix ODE. Our model is easy to calculate and captures the effect of regime uncertainty on the price and the term structure.

Keywords: Bond pricing, term structure, Markov switching regime, Vasicek model, CIR model, stochastic flows.

JEL classification: G12, E32,

*The first author acknowledges the supports of Australian Research Council and the SSHRC. The second author acknowledges the financial support of the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) Grand in Aid for Scientific Research (C) #23530362. The latest version of this paper is available at <http://ssrn.com/abstract=2009657>.

[†]School of Mathematics, University of Adelaide, Center for Applied Financial Studies, University of South Australia, Haskayne School of Business, University of Calgary. E-mail: relliott@ucalgary.ca.

[‡]International Graduate School of Social Sciences, Yokohama National University. 79-4 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan. E-mail: knishide@ynu.ac.jp.