Evaluating Government Bond Fund Performance with Stochastic Discount Factors

Wayne Ferson
Boston College and NBER

Tyler Henry
University of Washington

Darren Kisgen
Boston College

August 26, 2004

This paper shows how to evaluate the performance of managed portfolios using stochastic discount factors (SDFs) from continuous-time term structure models. The approach addresses a bias in performance measurement, described by Goetzmann, Ingersoll and Ivkovic (2000) and Ferson and Khang (2002), that arises when fund managers may trade dynamically within the return measurement interval or hold positions in replicable options. The solution gives rise to empirical factors formed as time-averages of the underlying state variables in the model. We find that these empirical factors contribute explanatory power in factor model regressions and reduce the pricing errors of the models. We illustrate the approach on a sample of U.S government bond funds during 1986-2000.

* Ferson is the Collins Chair in Finance at Boston College, 140 Commonwealth Ave, Chestnut Hill, MA. 02467. He may be reached at (617) 552-6431, fax 552-0431, wayne.ferson@bc.edu, www2.bc.edu/~fersonwa. Henry is a Ph.D student at the University of Washington School of Business Administration, Department of Finance and Business Economics Box 353200 Seattle, Washington 98195-3200, fax: 206 - 685-9392. Kisgen is an Assistant Professor of Finance at Boston College, and may be reached at (617) 552-2681, kisgen@bc.edu. Henry may be reached at thenry@u.washington.edu. We are grateful to Warren Bailey, Jeffrey Busse, Yong Chen, Campbell Harvey (the Editor), Edie Hotchkiss, Clifton Green, Eric Jacquier, Raymond Kan, Stanley Kon, Anthony Lynch, Shingo Goto, Steven Mann, Meijun Qian, Richard Roll, Rudi Schadt, Russ Wermers and an anonymous referee for help or suggestions. This paper was presented at Boston College, Harvard, HEC Paris, the University of Maryland, MIT, Princeton, the University of South Carolina and at the 2003 Conference on Financial Economics and Accounting, the 2003 Northern Finance Association meetings and the 2004 Conference on Emerging Markets: Innovations in Portfolio Management at the University of Virginia and the 2004 CIREQ-CIRANO Conference on Macroeconomics and Finance: The Term Structure of Interest Rates. An earlier pilot study benefited from workshops at Babson College, Boston University, Brandeis, the Universities of California at Los Angeles and Riverside, Cornell, the Federal Reserve Bank of Atlanta, the London Business School, London School of Economics, New York University, Northwestern, the Said Business School at Oxford University, the University of Texas at Dallas, Utah, the Warwick Business School and Wharton. Portions of this work were also presented at the 2003 Berkeley Program in Finance, the 2003 Boston College Finance Advisory Conference, the 2003 Chicago Quantitative Alliance conference, the 2003 European Finance Meetings and the 2003 McGill Conference on Global Asset Management. The authors appreciate financial support from the Gutmann Center for Portfolio Management at the University of Vienna and the Institute for Quantitative Research in Finance.