Euro Area Business Cycle Network Training School

Term Structure Modeling and the Lower Bound Problem

by

Jens Christensen

(Federal Reserve Bank of San Francisco)

7-9 September 2015, European University Institute, Florence

Deadline for applications: 10 July 2015

General Description

The course will cover the most recent literature on how to model the term structure of bond yields including the challenges posed by the asymmetric behavior of yields near their lower bound. Jens Christensen will teach the course. It is primarily aimed at participants in the Euro Area Business Cycle Network but applications will also be considered from doctoral students, post-doctoral researchers and economists working in central banks and government institutions outside of the network, as well as commercial organisations (fees applicable for non-network organisations).

Course Detail

The financial crisis of 2007-2008 and the subsequent Great Recession have had many economic consequences, one long-lasting is that government bond yields in leading fixed-income markets are near (and in some cases even below) the zero lower bound. Since bond yields behave differently near the lower bound, this poses challenges for standard models of the term structure. However, accounting for such asymmetries is important for both portfolio risk management and monetary policy analysis. In these lectures, Dr. Christensen will first provide an overview of the canonical classes of affine term structure models as per Dai and Singleton (2000) with particular focus on the workhorse arbitrage-free Nelson-Siegel model class introduced in Christensen et al. (2011) and the extension with stochastic volatility provided in Christensen et al. (2014). Also, the model estimation based on the Kalman filter and issues related to finite-sample bias will be discussed in some detail. Second, the lectures will describe several novel term structure models that account for the asymmetric behavior of yields near their lower bound, including the linear-rational models of Filipovic et al. (2014) and the shadow-rate arbitrage-free Nelson-Siegel model derived in Christensen and Rudebusch (2014) and their estimation based on the extended Kalman filter. Finally, these lectures will describe recent empirical applications, including research whose aim is to identify how unconventional monetary policy, most notably quantitative easing, affects government bond yields and other interest rates.

The following programme outlines the structure of the course, along with estimates of how much time will be spent on each topic:

Section I. Gaussian and non-Gaussian affine term structure models and their estimation (5 hrs).

The purpose of this section is to introduce the canonical affine term structure models as outlined by Dai and Singleton (2000), with particular emphasis on the class of arbitrage-free Nelson-Siegel models introduced in Christensen et al. (2011) and the extension to allow for stochastic volatility provided in Christensen et al. (2014). Also, we will discuss the estimation of these models based on the Kalman filter and issues related to finite-sample bias, see Bauer et al. (2012).

Section II. Term structure models that account for the lower bound of yields (5 hrs).

In this section, we first discuss the empirical problem posed by a lower bound of yields before we proceed to an introduction of various term structure models that account for the asymmetric behavior of yields near their lower bound, including the linear-rational models of Filipovic et al. (2014) and the shadow-rate arbitrage-free Nelson-Siegel model derived in Christensen and Rudebusch (2014). Their strengths and weaknesses will be highlighted and their estimation based on the extended Kalman filter described.

Section III. Empirical applications that include analysis of the effects of quantitative easing (5 hrs).

This section will review current term structure research with particular emphasis on analysis of the channels through which quantitative easing affect long-term interest rates as described in, for example, Gagnon et al. (2011), Christensen and Rudebusch (2012), and Christensen and Krogstrup (2015).

Administrative information:

The course will take place in Florence at the European University Institute and participants will be invited to make their own arrangements regarding their accommodation and meals. Further information will be available to successful applicants.

To apply, candidates need to send a current version of their CV to CEPR's Events Officer, Amanda Vincent-Rous avincentrous@cepr.org **by Friday 10 July (6pm UK time +1 GMT)**

About the instructor:

Jens Christensen is a senior economist in the Financial Research Section of the Federal Reserve Bank of San Francisco, which he joined in 2006 after receiving his PhD in finance from Copenhagen Business School. He also holds an MSc in economics from the University of Copenhagen. His research interests include credit risk modeling, credit risk management, and interest rate term structure modeling. His research in this area is widely cited and has been published in leading academic journals such as the Economic Journal, the Journal of Business and Economic Statistics, the Journal of Econometrics, the Journal of Financial Econometrics, and the Journal of Money, Credit, and Banking amongst others. Finally, he is a frequent presenter at international conferences on issues related to sovereign bond markets and monetary policy.