**Abstract**

This paper develops a Bayesian dynamic factor model to capture and forecast time-varying risk premia in U.S. equity markets, integrating both Fama-French factors and macro-level indicators from Bloomberg. The study builds on the foundational work of Fama and French (1993) and Carhart (1997) by allowing for dynamic factor exposures rather than assuming static loadings. Additionally, it extends Nozawa (2017) by incorporating macroeconomic influences into the decomposition of equity risk.

We begin by assembling a comprehensive daily dataset of individual stock returns from the CRSP database, filtering for common equities on major U.S. exchanges. These returns are augmented with the standard Fama-French and Carhart factors available through WRDS. To further enrich our explanatory framework, we incorporate key macroeconomic variables (such as interest rates, inflation measures, and industrial production) drawn from Bloomberg, thereby allowing real-time changes in the economic environment to influence factor exposures.

Methodologically, we propose a Bayesian state-space approach with time-varying parameter estimation. This approach employs a Markov Chain Monte Carlo (MCMC) estimation framework, which enables robust posterior inference on both parameter trajectories and latent state variables. Unlike traditional factor models, which often assume static exposures or discrete regime shifts, our model continuously updates factor loadings based on incoming data. This aligns with recent literature on dynamic risk premia and factor investing, providing a more flexible structure for capturing the evolution of factor returns.

A key innovation of this study is the introduction of macroeconomic indicators as state variables that influence factor risk premia. By doing so, we investigate whether shifts in macro conditions drive changes in equity factor exposures in real time, a question of central importance to hedge funds and asset managers. Our framework enables high-frequency updates of factor premia, moving beyond traditional monthly or quarterly estimation horizons.

We hypothesize that incorporating dynamic factor loadings and macroeconomic signals meaningfully improves out-of-sample return forecasts and enhances understanding of risk-return trade-offs in equity markets. The results offer actionable insights for investors seeking to adapt portfolio allocations in response to macroeconomic fluctuations. By blending the Fama-French factor tradition with cutting-edge Bayesian techniques and high-frequency Bloomberg data, this study provides a novel, granular perspective on factor investing and the evolving dynamics of equity risk premia.