

## Forecasting stock return distributions using mixture models

This presentation will provide examples of theory-informed mixture models which can improve forecasts, providing better bases for decisions. Models (whether cognitive or statistical) are increasingly important for separating signals from noise. It is important to model higher-order moments of distributions and their interdependence rather than modeling individual moments in isolation. I will discuss the power of mixture models for capturing the dynamics (e.g., changing shape) of the distributions. The flexible non-linear time-series models that result can be disciplined with parametric structure derived from theory and sensible priors, distinguishing them from black-box nonlinear models. Fundamentals, which are treated as latent in the dynamic time-series models, can be used to better understand sources of the dynamics and forecast change points. For example, textual analyses converting qualitative information (e.g., news) to quantitative measures (e.g., sentiment) can be useful for capturing the dynamics of the mixture parameters. I will then show how a theoretical representation of behaviour (a nonlinear pricing kernel derived from a generalized preference function) can be used to evaluate to what extent participants care about the dynamics of the stock return distributions (tail risk is priced).