

Asset Pricing with Regime Dependent Preferences and Learning

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The last four decades have witnessed tremendous progress in our understanding of the structure and behavior of asset prices (Merton (1973), Lucas (1978), Breeden (1979), Cox, Ingersoll and Ross (1985), Huang (1987)). The classic intertemporal asset pricing model, nevertheless, remains confronted with puzzling discrepancies between its theoretical predictions and the corresponding empirical evidence. The excess volatility phenomenon is one area where theoretical implications clash with the facts (Shiller (1981)). The equity premium puzzle is a second facet of this mismatch (Mehra and Prescott (1985)). Yet another aspect of this problematic is the abnormally high level of the interest rate implied by the model (Weil (1989)). A great deal of the asset pricing literature of the past twenty years has been devoted to the resolution of these well-known issues.

This research project seeks to address these fundamental issues. More precisely our goal is to study the impact of regime dependent preferences on equilibrium asset prices when information pertaining to the state of the economy is incomplete. The class of models developed builds on the regime-switching models with unobserved regimes and constant relative risk aversion developed by David (1997) and Veronesi (2000). The extension considered here allows for dependence between preferences and the growth regime. As the regime is not observed, this dependence implies that the individual learns about preferences at the same time as he/she learns about the growth state of the economy. The general formulation adopted is flexible. Regime-dependence pertains to risk aversion alone or risk aversion and the subjective discount rate in time preferences.

The first part of the project addresses methodological issues related to the construction of equilibrium quantities. We focus on obtaining analytical solutions to all of the fundamental components of the equilibrium, including the market prices of risk, the risk free interest rate, the stock return volatility, the stock price and the zero coupon bond price with fixed maturity. Equipped with these results we perform a preliminary assessment of the model's ability to explain observed asset prices moments and dynamics. The empirical work in the first part is limited to a 2-state model.

The second part of the research project focuses on developing an estimation methodology for a general multi-state model using both high and low frequency data (stock return, realized volatility for high frequency and consumption and price dividend ratio for low frequency).

The third part of the project studies the implication of the model for the valuation of fixed income securities. We study the implied term structure of interest rate and the ability of the model to explain observed behavior.

In the last part of the project we study the model's implication for the pricing of derivative securities. In particular we expect the model to have important implication for the pricing of long term options and for the dynamics of the implied volatility surface.

Research Team

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Fields of Research

Capital Markets

Quantitative Methods in Finance