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Christopher J. Elias

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Asset Pricing with Expectation Shocks

Christopher J. Elias[a]

[a]*Department of Economics, 703 Pray-Harrold, Eastern Michigan University, Ypsilanti, MI, 48197*

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Abstract

This paper adds persistent shocks into the adaptive learning expectation formation process in stochastic growth asset pricing production and endowment economies. These expectation shocks, designed to capture psychological elements which can arise from news, changes in sentiment, herding and bandwagon effects, etc., generate waves of optimism and pessimism in equity price forecasts. The paper estimates parameters of the expectation shock and adaptive learning process with the method of simulated moments, and compares simulation results to U.S. economic and financial market stylized facts. Numerical results for both the estimated production and endowment economies show that the expectation shock model matches several of the stylized facts better than does a model that assumes rational expectations or adaptive learning alone.

Keywords: Asset Pricing, Adaptive Learning, Expectations Formation, Expectation Shocks
JEL: D83, D84, G12, E37, E44

1. Introduction

Early economists argued that agent expectations, and ultimately, macroeconomic phenomena, are influenced by psychology. For example, Pigou (1927) and Keynes (1936) cited psychological factors as significant drivers of business cycle fluctuations. More recently, the link between psychology and expectations formation has been re-introduced into macroeconomics in various ways. One method is to incorporate an exogenous shock into the agent's forecasting equation. This paper adds to the literature by including these shocks, known as expectation shocks, into a standard asset pricing model to capture periods of euphoria and pessimism in asset price forecasts. Furthermore, the paper shows that the model with expectation shocks replicates a series of U.S. financial market and macroeconomic stylized facts better than a model with rational expectations or learning alone.

The setup assumes a representative agent that employs the adaptive learning method of expectations formation of Evans and Honkapohja (2001). The agent utilizes a forecasting model with the same form as the rational expectations equilibrium solution (REE) and behaves like an econometrician by updating the model parameters using constant gain learning and using the model to make forecasts of the equity price. In some periods, however, the forecast is subject to an exogenous, persistent shock that causes the forecast to be either above or below the value implied by the model itself. These shocks, which can be thought of as waves of optimism and pessimism arising

Email address: cjelias@gmail.com (Christopher J. Elias)
URL: https://sites.google.com/site/cjelias/ (Christopher J. Elias)