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Learning and mean reversion in asset returns

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Abstract

A constant discount rate model, where the probability of a dividend is initially unknown to Bayesian updating agents, is capable of generating returns that would lead the econometrician, using a variance ratio test, to reject the random walk model. The variance ratio statistic is highly likely to be significantly negative when learning is present, which is consistent with mean reversion. In addition, the negative bias of estimated low order autocorrelations is much stronger under learning. The standard debate on the causes of return reversals (overreaction -vs- efficient time varying risk premia) should include this third possibility: learning. © 1999 Board of Trustees of the University of Illinois. All rights reserved.

Keywords: Learning; Mean reversion

1. Introduction

There exists a large literature that examines whether asset returns are mean reverting. Studies by Poterba and Summers (1987) and Lo and MacKinlay (1988) used variance ratio tests to reject the random walk model of asset returns. Variance ratios for long horizons (3 to 5 years) tend to be significantly below unity which suggest that there are return reversals. If above/below average returns tend to be followed by below/above average returns then short term volatility will be higher than long term volatility (adjusted proportionately) since short term movements will tend to cancel each other out.

From a theoretical perspective, this evidence could be brought about by rational time-varying equilibrium risk premia or by an irrational overreaction of the market. This paper

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