



Behavioral heterogeneity in stock prices

H. Peter Boswijk^a, Cars H. Hommes^a, Sebastiano Manzan^{b,*}

^a*CeNDEF, Department of Quantitative Economics, University of Amsterdam, Roetersstraat 11,
1018WB Amsterdam, The Netherlands*

^b*Department of Economics, University of Leicester, University Road,
Leicester LE1 7RH, UK*

Available online 23 February 2007

Abstract

We estimate a dynamic asset pricing model characterized by heterogeneous boundedly rational agents. The fundamental value of the risky asset is publicly available to all agents, but they have different beliefs about the persistence of deviations of stock prices from the fundamental benchmark. An evolutionary selection mechanism based on relative past profits governs the dynamics of the fractions and switching of agents between different beliefs or forecasting strategies. A strategy attracts more agents if it performed relatively well in the recent past compared to other strategies. We estimate the model to annual US stock price data from 1871 until 2003. The estimation results support the existence of two expectation regimes, and a bootstrap *F*-test rejects linearity in favor of our nonlinear two-type heterogeneous agent model. One regime can be characterized as a *fundamentalists* regime, because agents believe in *mean-reversion* of stock prices toward the benchmark fundamental value. The second regime can be characterized as a *chartist, trend following* regime because agents expect the deviations from the fundamental to trend. The fractions of agents using the fundamentalists and trend following forecasting rules show substantial time variation and switching between predictors. The model offers an explanation for the recent stock prices run-up. Before the 1990s the trend following regime was active only occasionally. However, in the late 1990s the trend following regime persisted and reinforced an extraordinary deviation of stock prices from the

*Corresponding author. Tel.: +44 116 252 2854; fax: +44 116 252 2908.

E-mail addresses: h.p.boswijk@uva.nl (H.P. Boswijk), c.h.hommes@uva.nl (C.H. Hommes), s.manzan@le.ac.uk (S. Manzan).

fundamentals. Recently, the activation of the mean-reversion regime has contributed to drive stock prices back closer to their fundamental valuation.

© 2007 Elsevier B.V. All rights reserved.

JEL classification: G12; C22

Keywords: Heterogeneous expectations; Stock prices; Bubbles; Bounded rationality; Behavioral finance; Evolutionary selection

1. Introduction

Historical evidence indicates large fluctuations of stock prices compared to indicators of fundamental value. For example, the price to earnings ratio of the S&P500 was around 5 at the beginning of the 1920s, but more than 25 about nine years later to fall back to about 5 again by 1933. In 1995 the price/earnings ratio of the S&P500 was close to 20, went up to more than 40 at the beginning of 2000 and then quickly declined again to about 20 by the end of 2003. Why do prices fluctuate so much compared to economic fundamentals?

This question has been strongly debated in financial economics. At the beginning of the 1980s, Shiller (1981) and LeRoy and Porter (1981) claimed that the stock market exhibits *excess volatility*, that is, stock price fluctuations are significantly larger than movements in underlying economic fundamentals. The debate evolved in two directions. On the one hand, supporters of rational expectations and market efficiency proposed modifications and extensions of the standard theory. In contrast, another part of the literature focused on providing further empirical evidence against the efficiency of stock prices and behavioral models to explain these phenomena. The debate has recently been revived by the extraordinary surge of stock prices in the late 1990s. The internet sector was the main driving force behind the unprecedented increase in market valuations. Ofek and Richardson (2002, 2003) estimated that in 1999 the average price-earnings ratio for internet stocks was more than 600.

A recent overview of rational explanations based on *economic fundamentals* for the increase in stock prices in the late 1990s is e.g. given by Heaton and Lucas (1999). They offer three reasons for the decrease of the equity premium, i.e. the difference between expected returns on the market portfolio of risky stocks and riskless bonds. A first reason is the observed increase of households' participation in the stock market. This implies spreading of equity risk among a larger population, which could explain a decrease of the risk premium required by investors. Secondly, there is evidence that investors hold more diversified portfolios compared to the past. In the 1970s a large majority of investors concentrated their equity holdings on one or two stocks. More recently households have invested a large proportion of their wealth in mutual funds achieving a much better diversification of risk. Both facts justify a decrease of the required risk premium by investors. Although the wider participation seems unlikely to play an important role in the surge of stock prices in the 1990s, the increased portfolio diversification could at least partly account for the decrease in the

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات