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Valuation ratios and price deviations from fundamentals

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Abstract

This paper sheds light on US stock price deviations from fundamentals by analyzing the time-series dynamics of post-1870 S&P valuation ratios. It employs a non-linear, two-regime framework that allows for different behavior over phases of the stock market cycle. Persistence in the ratios implies prolonged price deviations from fundamentals stemming from short run continuation fueled by investor sentiment during bull markets. However, the pull from fundamentals ensures that valuation ratios and prices move toward their equilibrium levels in bear markets. Impulse response functions highlight sluggish adjustment and indicate that the effects of positive shocks are more pronounced and long-lasting in bull markets. The main conclusion is that, while market sentiment plays an important transitory role, valuation ratios do mean revert and so prices reflect fundamentals in the long run.

JEL classification: C40; G12

Keywords: Fundamentals; Behavioral finance; Investor sentiment; Threshold autoregression

1. Introduction

Do stock prices always reflect fundamentals or can they display short-run and, at times, seemingly persistent deviations from their long-run equilibrium values? This question has been at the heart of a debate in financial economics ever since Shiller's (1981) seminal

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study. For instance, Summers (1986) suggests that irrational fads in investor sentiment create sustained deviations of stock prices from intrinsic valuations and that rational investors might not be able to arbitrage away the mispricing because of noise trader risk. More recently, Shiller (2000) argues that the 1990s hike in prices and valuation ratios was fueled by investors' irrational exuberance. Likewise, Anderson et al. (2003) argue that US stock prices deviated from their fundamentals in the post-World War II period and suggest a role for irrationality. Finally, Lee et al. (2002) argue that market sentiment is a priced systematic risk that is positively correlated with shifts in excess returns. Bullish changes in sentiment lead to downward revisions in volatility and higher future excess returns and vice versa for bearish changes.

The issue of whether stock prices reflect fundamentals has been given new urgency by the sustained 1990s run up in prices. For example, US price–earnings (P/E) and price–dividend (P/D) series rose spectacularly during the course of that decade. The S&P (Standard and Poor's) composite P/E ratio hit an all-time peak of 44.2 in December 1999 that was more than double its long term historical mean level. Such behavior suggests that prices can become decoupled from fundamentals for protracted periods and interpreting and theorizing such extreme movements poses a challenge for financial economics. Several rationally based explanations for the recent hike in valuation ratios have been adduced. These include a decline in the equity premium, shifts in corporate payout policies and falls in the cost of stock market participation and diversification.[1] Other explanations are perhaps more plausible in a post-Enron world and, among them, factors such as noise trading, market sentiment and limits to arbitrage are prominent.

This paper makes several contributions to the literature. First, taking account of the stock market cycle enables us to shed light on the deviations of prices from fundamentals. We use economic theory to motivate asymmetric behavior driven by bull and bear market phases and test for it empirically using a two-regime model.[2] An interesting alternative approach is to employ models that allow for structural breaks in the ratios or the equity premium. This assumes mean reversion around a broken trend. For instance, Carlson et al. (2002) find that valuation ratios mean revert around a broken trend that shifts upwards in the early 1990s. Likewise, Manzan (2005) assumes a break in the equity premium during 1950 in analyzing the behavior of price–dividend ratios.

The present paper takes a different tack. Rather than assuming similar dynamics around a broken trend equilibrium, we conjecture that valuation ratios exhibit distinct dynamics around constant long-run equilibrium levels depending on the phase of the stock market cycle. Our empirical results support contrasting bull and bear market behavior and indicate no structural break. Crucially, when we reestimate our model excluding observations from the 1990s, our long-run equilibrium valuation ratio estimates remain unchanged. In this manner our results can help to reconcile the counterintuitive finding from linear specifications suggesting a lack of mean reversion or permanent stock price deviations from fundamentals (Campbell and Shiller, 2001).[3]

[1] See Campbell and Shiller (2001) for a critical evaluation of these and other explanations.

[2] For other recent non-linear models in finance see Brooks and Garrett (2002), Lekkos and Milas (2004) and McMillan (2004).

[3] This is also why Ackert and Hunter (1999) and Madsen and Milas (2003) employ regime-switching formulations of the price–dividend relationship based on managerial dividend behavior and levels of inflation, respectively, although their focus and models differ from ours.