



Bubbles in the dividend–price ratio? Evidence from an asymmetric exponential smooth-transition model

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Abstract

Recent stock price movements have led to a re-examination of the present value model. An increasing belief is that although dividends and prices are indeed cointegrated, they may exhibit non-linear dynamics in the process of reversion. This paper implements an empirical model designed to capture two possible explanations for such non-linearity, namely transaction costs and noise traders. Utilising data from a number of countries we show that the dynamics of the log dividend yield are, first, characterised by an inner random walk regime, where the benefits of engaging in trade do not outweigh the costs and so the process moves randomly. Second, a reverting outer regime where the dynamics of reversion differ between positive and negative deviations, such that price rises greater than the level supported by dividends exhibit a greater degree of persistence than price falls relative to dividends.

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1. Introduction

The recent behaviour in stock price dynamics has led researchers to re-examine the link between prices and the notion of fundamental value provided by the present value model.¹ This model argues that current prices depend upon the present value of discounted future dividends, where the discount rate is equivalent to the required rate of return. Much of the impetus for this renewed interest in the present value model arises from the unprecedented rise in stock prices at the end of the last century followed by the subsequent fall. Two broad schools of thought developed during the rise period. The first school developed, what can be termed, ‘new era’ explanations, for example, that the development of the new technology sector resulted in investors expecting higher future earnings and dividends, or that investors reduced the rate at which they discount future dividends, perhaps as a result of increased ease of trading.² The second school continued to argue that fundamentals had basically not changed, that they would reassert themselves, and the stock market was seriously over-valued (Campbell and Shiller, 2001, were the most notable proponents of this view). Following the fall in prices, the general consensus view was that prices merely experienced an extended bubble which ultimately burst, and researchers have asked whether previously implemented empirical techniques are sufficiently able to capture these dynamics. This has subsequently led to a reassessment of the time-series properties of prices and dividends, and whether they do indeed exhibit a long-run relationship.

The extant empirical evidence on the nature of the dynamics of the price–dividend relationship tends to fall in to two broad lines of enquiry; those reporting unit root behaviour in the price–dividend relationship, which in turn provides implicit support for the ‘rational’ bubbles hypothesis (e.g. see Froot and Obstfeld, 1991; Lamont, 1998; Balke and Wohar, 2002; Bohl and Siklos, 2004), and those arguing that the price–dividend ratio exhibits fractional integration such that while it is characterised by long memory, the series is ultimately mean reverting (Caporale and Gil-Alana, 2004; Cuñado et al., 2005; Koustas and Serletis, 2005). Furthermore, the majority of extant studies on the relationship between prices and dividends have focussed upon the US stock market. In this paper we seek to extend that analysis to data from a range of countries. Some notable exceptions that do not exclusively focus upon US data include, Brooks and Katsaris (2003) who argued in favour of the bubble hypothesis in the UK, Kapetanios et al. (2006) who in the course of developing test statistics for non-linear (in particular, exponential smooth-transition, ESTR) cointegration analysed the behaviour between prices and dividends for eleven major international indices, and Kanas (2005) who reports non-linear dynamics in the price–dividend relationship for Germany, Japan, the UK and US.

The present paper seeks to extend the current analysis, including that conducted by Brooks and Katsaris (2003), Kapetanios et al. (2006) and Kanas (2005), in several ways. First, each of these studies tests for cointegration between real prices and dividends. This implies that the underlying present value model is one in which the discount rate is constant. In common with most of the extant literature reported above for the US, we seek

¹ A non-exhaustive list of examples include, Balke and Wohar (2001, 2002), Psaradakis et al. (2004), Caporale and Gil-Alana (2004), Bohl and Siklos (2004) and Nasseh and Strauss (2004).

² For examples relating to the new economy explanations see Greenwood and Jovanovic (1999) and Browne (1999). For examples relating to a fall in the discount rate see Siegel (1999), Heaton and Lucas (1999) and Fama and French (2002).

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