Finance Research Letters 10 (2013) 184–195

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Dividend sensitivity to economic factors, stock valuation, and long-run risk

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ARTICLE INFO

Article history:
Received 5 April 2013
Accepted 21 July 2013
Available online 27 July 2013

JEL classification:
D91
G12

Keywords:
Multifactor model
Intertemporal model
Stock valuation
CCAPM
Long-run risk

ABSTRACT

In this paper, we develop a theoretical stock valuation model that takes into account the long-run sensitivity of dividends to various economic factors. Our valuation process integrates the multidimensionality of uncertainty, as well as the long-run concept of risk (recently proposed in the literature). More precisely, we demonstrate that a stock's long-run dividend growth is negatively related to its current dividend–price ratio and linearly related to N sensitivity coefficients, given by the long-run sensitivity between dividends and economic factors. Then, we show that the equilibrium price of a stock is a function of its current dividend, long-run dividend growth, and N risk parameters.

1. Introduction

There are many different ways to value stocks. Among the most popular methods employed by analysts or researchers, there is the dividend discount model, popularized by Gordon (1962), the earnings multiplier approach, developed by Basu (1977), and the residual income technique, proposed by Ohlson (1995). Following traditional models, other approaches have also emerged in the theory of stock valuation. For example, Hurley and Johnson (1994, 1998) extend the dividend discount model, assuming that dividends follow a Markov process. Donaldson and Kamstra (1996) extend the Gordon model, using statistical models of discounted dividend growth rates. Feltham and Ohlson (1999) provide a general version of the residual income technique in introducing risk and stochastic interest

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http://dx.doi.org/10.1016/j.frl.2013.07.004

rates. Pastor and Veronesi (2003) derive a simple approach to valuing stocks in the presence of learning about average profitability. Bakshi and Chen (2005) present a stock valuation model in which the expected earnings growth rate follows a mean-reveting process. Dong and Hirshleifer (2005) generalize the model of Bakshi and Chen in proposing a stock valuation model that is not restricted to positive-earnings companies. Yee (2008) suggests a Bayesian framework for combining two or more estimates into a superior valuation estimate.

More recently, Bergeron (2011) develops a valuation model that integrates the long-run definition of consumption risk into the stock valuation process.

According to Beeler and Campbell (2012), the long-run concept of risk has attracted a great deal of attention since the important work of Bansal and Yaron (2004).

Indeed, Bansal and Yaron argue that consumption and dividend growth rates include a small long-run component that can resolve the equity premium puzzle. Also, Bansal et al. (2005) show that long-run covariance between dividends and consumption (cash flow beta) accounts for more than 60% of the cross-sectional variation in risk premia. Moreover, Hansen et al. (2008) characterize and measure a long-run risk-return tradeoff for the valuation of financial cash flows exposed to fluctuations in macroeconomic growth. In addition, when investor horizon tends to infinity, Bansal et al. (2009) reveal that the risk of an asset is determined almost exclusively by the long-run cointegration between its dividends and consumption. Furthermore, Bansal and Kiku (2011) measure the long-run relation between asset dividends and aggregate consumption via a stochastic cointegration.[1]

However, none of the above mentioned studies derived a stock valuation model that integrates the multiple dimensions of long-run risk.

In this paper, we extend the work of Bergeron (2011) in integrating the multidimensionality of uncertainty, as well as the long-run concept of risk, into the stock valuation process.

More particularly, we develop a theoretical stock valuation model that takes into account the long-run sensitivity of dividends to various economic factors. Our model development is based on the intertemporal framework of the consumption capital asset pricing model (CCAPM) of Rubinstein (1976), Lucas (1978), and Breeden (1979). Our first result shows that a stock's long-run dividend growth is negatively related to its current dividend–price ratio and linearly related to N sensitivity coefficients, given by the long-run covariance between dividends and economic factors. Our next result indicates that the equilibrium price of a stock is a function of its current dividend, long-run dividend growth, and N risk parameters.

Compared to Bergeron (2011), our methodology presents two major differences, in addition to the integration of the multidimensionality of uncertainty. First, the constant relative risk aversion assumption via the power utility function is not required. Second, the normality hypothesis can be relaxed.

The remainder of this paper is organized in five sections. The next section presents the dividend multifactor process. The third section describes the intertemporal equilibrium framework of our model. The fourth section derives the multirisk relationships. The last section concludes the paper.

2. The dividend multifactor process

The basic assumption of our intertemporal model is that stock dividend growth rates are generated by a number of economic factors. More precisely, given the available information in time t, we assume that the dividend growth rate of stock i, between time t and time $t+1$, $\tilde{g}_{i,t+1}$, is a linear function of N factors as shown below:

$$\tilde{g}_{i,t+1} = a_{it} + b_{1it}\tilde{F}_{1,t+1} + b_{2it}\tilde{F}_{2,t+1} + \ldots + b_{Nit}\tilde{F}_{N,t+1} + \tilde{\varepsilon}_{i,t+1}, \tag{1A}$$

with;

$$E_t[\tilde{\varepsilon}_{i,t+1}] = COV_t[\tilde{\varepsilon}_{i,t+1}, \bullet] = 0,$$

[1] See also Malloy et al. (2009) and Bergeron (2012).