ELSEVIER

Journal of Econometrics 109 (2002) 195–237

JOURNAL OF Econometrics

www.elsevier.com/locate/econbase

Market efficiency, asset returns, and the size of the risk premium in global equity markets☆

Ravi Bansal[a,*], Christian Lundblad[b]

[a] *Fuqua School of Business, Duke University, Durham, NC 27708, USA*
[b] *Kelley School of Business, Indiana University, Bloomington, IN 47405, USA*

Received 18 January 2002; accepted 24 January 2002

Abstract

An important economic insight is that observed equity prices must equal the present value of the cash flows associated with the equity claim. An implication of this insight is that present values of cash flows must also quantitatively justify the observed volatility and cross-correlations of asset returns. In this paper, we show that parametric economic models for present values can indeed account for the observed high ex post return volatility and cross-correlation observed across five major equity markets—the U.S., the U.K., France, Germany, and Japan. We present evidence that cash flow growth rates contain a small predictable long-run component; this feature, in conjunction with time-varying systematic risk, can justify key empirical characteristics of observed equity prices. Our model also has direct implications for the level of equity prices and specific versions of the model can, in many cases, capture observed price levels. Our evidence suggests that the ex ante risk premium on the global market portfolio has dropped considerably—we show that this fall in the risk premium is related to a decline in the conditional variance of global real cash flow growth rates.

JEL classification: F3; G0; C1; C5

Keywords: Asset volatility; Correlation; Cash flows; Risk premia; Fundamental values

1. Introduction

An important economic insight is that observed equity prices should equal the present value of the cash flows associated with the ownership of the equity claim. The work

☆ An earlier version of this paper was titled, "Market efficiency, fundamental values, and asset returns in global equity markets". All data employed in this paper are available at www.kelley.iu.edu/clundbla/research.htm.

* Corresponding author. Tel.: +1-919-660-7758; fax: +1-919-660-8038.
E-mail addresses: ravi.bansal@duke.edu (R. Bansal), clundbla@indiana.edu (C. Lundblad).

0304-4076/02/$ - see front matter
PII: S0304-4076(02)00067-2

of Shiller (1981), LeRoy and Porter (1981), West (1988), and Campbell and Shiller (1987, 1988a, b), however, poses a challenge to this insight. These authors document the "volatility puzzle"—quantitatively, equity prices are far too volatile to be justified as present values of fundamental cash flows. This result underscores the key feature of the data that cash flow volatility is quite small relative to equity price volatility. In addition to implications for volatility, present values also restrict cross-correlations of asset returns. In the data, the average cross-correlation in ex post returns is about six times larger than that for the cash flow growth rates. This feature poses an additional quantitative challenge to present values, and is labeled the "correlation puzzle". Present values of the cash flows are determined by the time-series dynamics of the expected cash flow growth rates and the cost of capital (i.e., ex ante rate of return). In this paper, we show that a parsimonious time-series model for cash flow growth rates and the cost of capital goes a long way in explaining the observed equity market volatility and return cross-correlations.

The main insights that this paper provides can best be understood by first considering the role of the cash flow dynamics, followed by that of fluctuations in the cost of capital. In the data, real growth rates have near zero autocorrelation, hence, it is common to assume that cash flow growth rates are i.i.d. In addition to this assumption, if cost of capital is constant, then news regarding cash flow growth rates is entirely transitory and does not alter future expected growth rates. Consequently, dividend yields are constant and ex post continuous return volatility equals the growth rate volatility. However, as cash flow growth rate volatility is smaller than return volatility, this leads to the volatility puzzle discussed above.

In sharp contrast, Barsky and DeLong (1993), argue that cash flow *growth rates* can be modeled as an integrated process (more precisely, an ARIMA(0,1,1) process). It is important to note that in finite samples, the Barsky and DeLong process for growth rates cannot easily be distinguished from an i.i.d. process (see Shephard and Harvey, 1980), but the economic implications for asset prices are dramatically different. Expected growth rates in this specification contain a unit root, and consequently, news regarding growth rates have large effects on dividend yields as they permanently alter future expected growth rates.[1] Campbell et al. (1997) argue that Barsky and DeLong (1993) do not provide any direct empirical support for their growth rate dynamics—further, it is not clear if an integrated growth rate process is economically plausible. In this paper, unlike Barsky and DeLong (1993), we provide empirical evidence that growth rates are well modeled as a stationary (i.e., no unit root) ARIMA(1,0,1) process. As cash flow growth rates contain a small predictable (and persistent) component, growth rate news leads to volatile changes in dividend yields and ex post returns. This structure helps address the "volatility puzzle" and the "correlation puzzle" discussed above.

With constant cost of capital for each economy, the ex post return cross-correlations across economies will be solely determined by the cash flow growth correlations. However, this is unlikely to justify return cross-correlation, as growth rate correlations

[1] At a firm level, it is well documented that cash flow news leads to significant price reaction (see Easton and Zmijewski, 1989).