8 Accounting for Stock Price Movements

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1 INTRODUCTION

Until recent years, most finance economists believed that expected stock returns were constant through time. This belief implied that unexpected stock returns were driven by news about future dividends. Since finance theory has little to say about the economic forces behind dividend expectations, finance economists were generally content to treat unexpected stock returns as exogenous, and to work instead on the determination of mean returns given risk aversion and exogenous variances and covariances of returns. Fama (1970) is a particularly clear survey of this traditional approach to finance.

Fama (1991), a more recent survey of empirical asset pricing, reviews a large body of evidence that expected stock returns in fact vary through time. This chapter draws out the implications of time-varying expected stock returns for the way economists should think about unexpected stock returns. Section 2 shows that unexpected stock returns can be broken into components attributable to news about future dividends and news about future returns. News about future returns can in turn be broken into news about future real interest rates and news about future excess stock returns. Section 3 summarizes recent work on US stock price behaviour which suggests the importance of the last component, news about future excess returns. Section 4 discusses how these findings should influence theoretical work on the economics of stock market behaviour.

2 A DYNAMIC ACCOUNTING IDENTITY

To relate unexpected returns to changes in expected returns, one needs a tractable framework relating stock prices to dividends and returns. The difficulty is that the standard present value formula is non-linear,
and therefore hard to use in time-series analysis, when expected returns vary.

Campbell and Shiller (1988a, 1988b) have proposed a simple loglinear approximate framework as a way to resolve this difficulty. They start with the definition of the log stock return, treat it as a non-linear function of the log dividend-price ratio, and then take a first-order Taylor approximation around the mean log dividend-price ratio. The resulting approximation is

\[ h_{t+1} = \log(P_{t+1} + D_{t+1}) - \log(P_t) \approx k + \rho p_{t+1} + (1 - \rho)d_{t+1} - p_t \]  

(1)

where \( h_{t+1} \) is the log one-period stock return, \( P_t \) is the stock price, \( D_t \) is the dividend, and lower-case letters denote logs of the corresponding upper-case letters. The parameter \( \rho \) comes out of the linearization; it equals \( 1/(1 + \exp(d - \rho)) \), a number slightly smaller than one.

Next, Campbell and Shiller assume that there is no explosive price behaviour so that (1) can be solved forward to an infinite horizon. They take expectations to obtain

\[ P_t = E_t \sum_{j=0}^{\infty} \rho^j [(1 - \rho)d_{t+1+j} - h_{t+1+j}] \]  

(2)

This equation says that if the stock price is high today, then investors must expect either high future dividends, or low future returns.

Campbell (1991) substitutes (2) into (1) to get an expression describing returns:

\[ h_{t+1} - E_t h_{t+1} = (E_{t+1} - E_t) \sum_{j=0}^{\infty} \rho^j \Delta d_{t+1+j} \]

\[ - (E_{t+1} - E_t) \sum_{j=1}^{\infty} \rho^j h_{t+1+j} \]  

(3)

This equation says that unexpected real stock returns must be associated with changes in expectations of future real dividends or real stock returns. Campbell (1991) also defines the excess stock return \( e_{t+1} = h_{t+1} - r_{t+1} \), where \( r_{t+1} \) is a short-term real interest rate. Equation (3) then implies that

\[ e_{t+1} - E_t e_{t+1} = (E_{t+1} - E_t) \sum_{j=0}^{\infty} \rho^j \Delta d_{t+1+j} \]