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A comparison of investors' sentiments and risk premium effects on valuing shares☆

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ABSTRACT

This paper investigates at what extent deviations between market share prices and their fundamental values can be explained by risk premium and/or investors' sentiment effects. This is done based on recent panel data econometric techniques controlling for the effects of unobserved common factors on our estimation and inference procedures. To calculate the fundamental values of the shares, the paper relies on book value and yearly earnings forecasts of the listed companies, over the period 1987–2012. The results of the paper indicate that share price deviations from their fundamental values can be explained by both risk premium and sentiment effects. The latter lead to overvaluation of market share prices during normal market time times. In contrast, during periods of financial crises, share prices tend to reverse to their fundamental values. The unobserved common factors identified by fitting our model into the data do not add too much to the explanatory power of it, compared to the observed economic variables often used in the literature to capture the sentiment and/or risk premium effects.

1. Introduction

Based on Ohlson (1995) share price valuation model, this paper examines if deviations of share prices from their fundamental values can be explained by missing risk premium effects (see, Fama and French, 1993; 2014) and/or investors' behavioral biases (e.g., excessive optimism or other psychological characteristics referred to as investors' sentiments, see De Bondt and Thaler (1987), Barberis et al. (1998) and Baker and Wurgler (2006)). Ohlson's model has the following attractive features. It treats investment in a share as a balance sheet factor, and not as one that reduces cash flows (see Penman and Sougiannis, 1998). It relies its valuation on the book value of a firm, which is a readily available variable, and on the present value of future abnormal earnings for some years ahead, which can be obtained from financial statement data announced by firms. Thus, it avoids making assumptions about future dividends processes.

Our empirical methodology employs recently developed panel data econometric techniques controlling for the effects of unobserved common factors on the explanatory power of regressors capturing risk premium and/or sentiment effects.

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Identifying these factors and measuring their explanatory power on share prices can indicate at what extent compared to the observed ones can explain cross-sectional and time-series, total variation of share prices from their fundamental values. The data used in our analysis includes 37 companies from the FTSE 100 index, traded continuously in the UK stock market between years 1987 and 2012. This period covers a number of extraordinary events, like the years 1987, 1997, 2001, 2008 and 2010 stock markets crises, which may have triggered behavioral effects on share prices.

The paper is organized as follows. Section 2 presents the share price valuation model, while Section 3 the empirical methodology of the paper and it discuss the estimation results. Section 4 concludes the paper.

2. Share valuation

Ohlson's model (see also Feltham and Ohlson, 1995) suggests that the fundamental (theoretical) value of share i, at time t (denoted P_{it}^{*}), is determined by the book value and discounted future abnormal earnings, i.e.,

$$P_{it}^{*} = B_{it} + \sum\nolimits_{\tau=1}^{n} \frac{\mathcal{E}_t(E_{it+\tau} - r_f B_{it+\tau-1})}{(1+r_f)^{\tau}}, \text{ for all } i, \tag{1}$$

where $B_{it+\tau-1}$ and $E_{it+\tau}$ respectively denote the book value and company (firm) earnings per share, r_f is the risk-free interest rate (known as discount factor), $\mathcal{E}_t(.)$ denotes the expectations' operator conditional on the current t-time information set I_t and $E_{it+\tau} - r_f B_{it+\tau-1}$ presents the abnormal earnings of firm i in future period $t+\tau$. These earnings constitute the difference between firm's i earnings $E_{it+\tau}$ and its opportunity cost of capital. As competition forces, earnings $E_{it+\tau} - r_f B_{it+\tau-1}$ are assumed to converge to zero. Thus, they are set to zero in (1), after period $t+n$.

As it stands, model (1) does not allow for risk premium and/or investors' sentiment effects. These effects can explain deviations between the fundamental values of share prices, P_{it}^{*}, and their market values, denoted as P_{it}. Risk premium effects are expected to reduce the actual (market) share price P_{it}, at time t, compared to its fundamental value P_{it}^{*} in order to discount for possible future loses, or reductions, in future earnings $E_{it+\tau} - r_f B_{it+\tau-1}$. Such loses will require higher expected returns on a share i, compared to that implied by its fundamental value P_{it}^{*}. On the other hand, investors' sentiment effects will tend to overvalue price P_{it} during periods of optimism of the market. In contrast, in periods of financial crises (often associated with bubbles burst), sentiment effects will have reverse effects on P_{it} (see, Brown and Cliff, 2004; Shan and Gong, 2012 and Smales, 2014). These will tend to revert P_{it} towards its fundamental value P_{it}^{*}.

3. Empirical analysis

To investigate the relative importance of risk premium and/or sentiment effects in explaining deviations of share prices from their fundamental values, i.e., $P_{it} - P_{it}^{*}$, we consider the following panel data model:

$$P_{it} - P_{it}^{*} = c_i + \sum_{j=1}^{J} \beta_{ij} z_{ijt} + \sum_{k=1}^{K} \gamma_{ik} x_{kt} + \delta_i SENT_t + u_{it}, \text{ for } \tilde{i} = 1, 2, \ldots, N \text{ and } t = 1, 2, \ldots, T, \tag{2}$$

where u_{it} stands for the error term which has a common factor representation, i.e.,

$$u_{it} = \sum_{m=1}^{M} a_{im} f_{mt} + e_{it}, \ \ with\ e_{it} \sim IID(0, \sigma_e^2). \tag{3}$$

Model (2) considers three different groups of variables in explaining $P_{it} - P_{it}^{*}$. The first contains variables z_{ijt}, reflecting J-different firm specific effects, like the size of a firm i (denoted as *SIZE*), its earning-price, and its book-to-market and dividend-price ratios, denoted respectively as E/P, B/M and D/P. These variables can capture the Fama-French risk premium factors. The second group, defined by variables x_{kt}, includes K-observed macroeconomic variables reflecting business cycle movements of the risk premium (see Ferson and Harvey, 1993; Flannery and Protopopadakis, 2002). These variables are common, for all shares i. They often include the GDP growth rate (*GROWTH*), inflation rate (*INF*), the term spread between the long and short term interest rates (*TERM*), the discount interest rate factor (*DF*) and the real effective exchange rate (*EXCH*), as well as the stock market aggregate return (*MARKET*), used by the CAPM to price the market risk premium effects. Finally, the last group of explanatory variables contains those capturing investors' sentiment effects (denoted as *SENT*).

One attractive feature of model (2) is that, apart from observed economic variables, it allows for M-unobserved common factors f_{mt} to explain price deviations $P_{it} - P_{it}^{*}$. Estimating the model with these factors can evaluate if there are any remaining factors with significant explanatory power on $P_{it} - P_{it}^{*}$, beyond those captured by the observed economic variables considered above. The relative importance of these factors on $P_{it} - P_{it}^{*}$ can be assessed by a fit performance measure of the model, like the coefficient of determination R^2 and/or an information criterion. Panel data methods enable us to estimate the time series observations of factors f_{mt} from the residuals of model (2), obtained in a first step, by exploiting the cross-section dimension of the data.