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Are good-news firms riskier than bad-news firms?

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ABSTRACT

This paper examines the relative risk of good-news firms, i.e., those with high standardized unexpected earnings (SUE), and bad-news (low SUE) firms using a stochastic discount factor approach. We find that a stochastic discount factor constructed from a set of basis assets helps explain post-earnings-announcement drift (PEAD). The risk exposures on the pricing kernel increase monotonically from the lowest to highest SUE sorted portfolios. Specifically, good-news firms always have higher risk exposures than bad-news firms in both 10 SUE sorted portfolios and 25 size and SUE sorted portfolios. However, the estimated expected risk premium is too small to explain the observed magnitude of returns on the PEAD strategy. Our risk adjustment can explain only about one-fourth of the total magnitude of the average realized return to the PEAD strategy. As a result, the average risk-adjusted returns of earnings momentum strategies are mostly positive and significant. Overall, our results support the view that at least some portion of the returns to the earnings momentum strategies examined represent compensation for bearing increased risk.

1. Introduction

Post-earnings-announcement drift (PEAD), or earnings momentum, refers to the fact that stock returns continue to drift in the direction of earnings surprises for several months after earnings are announced. It is well documented in the literature that a simple trading strategy that is long in stocks with the highest earnings surprises and short in stocks with the lowest earnings surprises generates significantly positive abnormal returns (e.g., Chordia and Shivakumar, 2005). PEAD is still robust after its initial discovery by Ball and Brown (1968). Subsequent studies have shown the robustness of earnings momentum using different samples and methods or using evidence on an international scale.[1]

While PEAD has been robust over the four decades, interpretations of this phenomenon are less clear. In a (semi-strong form) efficient market, all public information released into the market should be instantly reflected in stock prices, because investors immediately adjust their expectations about future earnings. Thus, returns on trading strategies that use only public information should display no abnormal patterns. Evidence of such abnormal returns on earnings momentum may therefore be interpreted as going against the efficient market hypothesis. For instance, Bernard and Thomas (1990) suggest that earnings momentum is a manifestation of a delayed response to the information in earnings announcements. Tests of market efficiency, however, are always necessarily joint tests of market efficiency *and* the asset pricing model used to determine the expected return (Fama, 1970; Roll, 1977). All studies that show earnings momentum rely on specific pricing models. For example, Bernard and Thomas (1990) adopt the five factor model of Chen et al. (1986). Chordia and Shivakumar (2005) use a factor related to news about future inflation. However, if the pricing models used in such studies are mis-specified, the abnormal returns inferred from their use are incorrect as well. That is, such studies may suffer from a "bad model" problem, as Fama (1998) points out.

In this paper, we revisit the relative risk of good-news firms, i.e., those with high standardized unexpected earnings (SUE), and bad-news (low SUE) firms. Rather than choosing a particular pricing model, we take an alternative approach using a stochastic discount factor, first proposed by Chen and Knez (1996).[2] This approach initially extracts the stochastic discount factor, or pricing kernel, from a set of basis assets, then uses these to price other assets. In contrast to

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[1] Foster et al. (1984), Bernard and Thomas (1990) and Livnat and Mendenhall (2006) confirm the robustness of Ball and Brown (1968) using recent samples and differing methods. Hew et al. (1996) and Booth et al. (1996) provide an international evidence for earnings momentum.

[2] This approach has been used in various contexts in the literature. Ahn et al. (2003a) apply this approach to examine the profitability of momentum strategies. Ahn et al. (2003b) study the long-term returns of seasoned equity issues using this approach.

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studies that rely on a particular pricing kernel implied by a specific pricing model, this approach retrieves a set of admissible pricing kernels based on minimal restrictions, such as the law of one price.[3] Therefore, this approach allows us to examine whether PEAD can be explained with the minimal restriction of equilibrium in securities markets (Ahn et al., 2003a).

We document two main results. First, a stochastic discount factor constructed from a set of basis assets helps explain PEAD. The risk exposures on the pricing kernel increase monotonically from the lowest to the highest SUE-sorted portfolios. Specifically, good-news firms always have higher risk exposures than bad-news firms in both 10 SUE sorted portfolios and 25 size and SUE sorted portfolios. Further, our results remain unchanged when we choose alternative basis assets, impose the additional restriction that the pricing kernel be positive, and allow investors' expectations to vary depending on public information.

Second, even though a pricing kernel extracted from a set of basis assets goes in the right direction in explaining PEAD, the estimated expected risk premium is too small to explain the observed magnitude of the earnings momentum. Specifically, for 10 SUE sorted portfolios, our constructed pricing kernel can explain only about 25% of the average observed earnings momentum profit. The average realized return to the PEAD strategy is 1.60% per month, whereas the average expected return to the PEAD strategy is 0.40%. Similar results are obtained for 25 size and SUE sorted portfolios: the portion that our risk adjustment can explain varies from 20% to 40% depending on the size quintile. As a result, the average risk-adjusted returns of earnings momentum strategies are mostly positive and significant.

Our results support the view that at least a portion of the returns to the PEAD strategy represent compensation for bearing increased risk. That is, good-news firms outperform bad-news firms because the former have greater risk exposure than the latter. Given that our analysis imposes only the minimal restriction of equilibrium in securities markets, the fact that previous studies fail to show cross-sectional differences in risk to be the source of profits to the PEAD strategy may be attributable to the use of mis-specified pricing models.

Several other studies provide risk-based evidence of PEAD. Kim and Kim (2003) construct a risk factor related to unexpected earnings surprises, and document that this risk factor helps to reduce an abnormal return to the PEAD trading. Sadka (2006) shows that liquidity risk can explain a portion of PEAD returns.[4] We add to this literature by adopting an alternative approach not considered in the literature.

This paper proceeds as follows. Section 2 presents empirical method. Section 3 describes the data. Section 4 reports our empirical results. Section 5 presents our conclusions.

2. Empirical methodology

The proper specification of "normal" or expected return is important in computing abnormal returns (i.e., alpha) on trading strategy. Most studies in the PEAD literature use specific asset pricing models. For example, Bernard and Thomas (1990) adopt the five factor model of Chen et al. (1986). However, there is substantial evidence that the extant asset pricing models are mis-specified in one way or another (Hodrick and Zhang, 2001; Lewellen et al., 2010). Thus, it is unclear whether previous evidence on abnormal returns on the PEAD strategy is due to mispricing by investors or the use of mis-specified asset pricing models. To avoid this problem, we adopt an alternative approach that uses a set of basis assets to determine abnormal returns on the PEAD trading strategy, rather than a particular asset pricing model.

This method is based on the stochastic discount factor approach to asset pricing. Under the law of one price, there exists a stochastic discount factor m_t such that

$$E[m_{t+1}R_{N,t+1}] = 1_N, \tag{1}$$

where $R_{N,t+1}$ denotes an n-vector of gross returns on the basis assets used in our analysis, and 1_N is an n-vector of ones. The returns are risk adjusted by the discount rate, m_{t+1}, so that the expected present value per dollar invested is equal to today's price, 1. Thus, m_{t+1} is usually called a stochastic discount factor (or pricing kernel). The pricing equation should hold for all assets in the economy. However, it is necessary to limit our attention to a relatively small subset of all trading assets (i.e., basis assets) to maintain a tractable estimation.

Expressing the pricing equation of Eq. (1) in terms of expected returns, we have

$$E[R_{i,t+1}] = \frac{1}{E[m_{t+1}]} - \frac{Cov(m_{r+1}, R_{i,t+1})}{E[m_{t+1}]} \tag{2}$$

Expected return on each asset is determined by the covariance of the return on the asset with the pricing kernel. An asset that pays off poorly in bad economic states when the pricing kernel (intertemporal marginal rate of substitution) is high should have high expected return as compensation for bearing risk.

Hansen and Jagannathan (1991) study how to extract the stochastic discount factors from a given set of basis assets. They show that a valid pricing kernel can be formed as $m_t = b'R_{N,t}$, with $b = E[R_{N,t}R'_{N,t}]^{-1}1_N$. The advantage of this pricing kernel is that it is marketable as a linear combination of basis assets. Nonetheless, the disadvantage of this pricing kernel is that the corresponding portfolio on the mean–variance frontier is the one with the minimum second moment among all portfolios on the frontier, and can be graphically found as the tangency point between the mean–variance frontier and a circle with its center at the origin (DeRoon and Nijman, 2001; Cochrane, 2005). The problem with this portfolio is that it is located at an inefficient part of the frontier, implying that it is economically not very interesting. To remedy this problem, we follow Dahlquist and Soderlind (1999) and make the mean value of the pricing kernel equal to the reciprocal of the (gross) return on the risk-free asset.[5] Specifically,

$$m_t = c + \beta' R_{N,t'} \tag{3}$$

where $\beta = E[R_{N,t}R'_{N,t}]^{-1}(1_N - cE[RN,t])$

$$c = \frac{E[m_t] - E[R_{N,t}]'E[R_{N,t}R'_{N,t}]^{-1}1_N}{1_N - E[R_{N,t}]'E[R_{N,t}, R'_{N,t}]^{-1}E[R_{N,t}]}$$

This choice ensures that the corresponding portfolio is on the efficient part of the mean–variance frontier. The only assumption used in deriving this pricing kernel is that the law of one price holds. Since this assumption is weak relative to equilibrium asset pricing models such as the CAPM, we may ask whether returns on the PEAD strategy can be explained with the minimal restriction of equilibrium in securities markets.

3 The law of one price is a necessary and sufficient condition for equilibrium in securities markets (see Hansen and Richard, 1987).

4 The stochastic discount factor approach used in Section 3.4 of Sadka (2006) differ from our approach. Our approach does not rely on any specific asset pricing model, while Sadka uses a particular model, i.e., his proposed model where the liquidity risk factor arises as a new risk factor. We retrieve a set of admissible stochastic discount factors assuming the minimal restriction of equilibrium in financial markets, while Sadka specifies the stochastic discount factor as a function of liquidity risk.

5 Dahlquist and Soderlind (1999) and Farnsworth et al. (2002) discuss the importance of identifying the mean of the stochastic discount factor. The stochastic discount factor corresponds to the mean–variance efficient portfolio only when its mean is a reasonable value (Cochrane, 2005).