NEW FRONTIER

Market Inefficiency and Asset Pricing Theory: Recent Trends III.[1]

By

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Heard on the Random Walk

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Studies of market efficiency have been an important source of information concerning the behavioral characteristics of capital markets. In the past, studies have supported the semi-strong Efficient Market Hypothesis (EMH) which asserts that the market is informationally efficient with respect to publicly available information. However, as reported in the previous two issues of *Quantitative Investment Strategies* (QIS), a number of recent studies report statistically significant risk-adjusted returns based on earnings and/or dividend information available at the beginning of the period. Since EMH studies of this type are generally joint tests of market efficiency and of a return generating process consistent with the Capital Asset Pricing Model (CAPM), rejection of the EMH focuses attention on each component part of the hypothesis.

As discussed in the June issue of QIS, Ball (*Journal of Financial Economics,* June/September 1978) observes that there are important structural and empirical differences between studies which use earnings yield (E/P ratio) and unexpected earnings (EPS) to rank stocks and measure abnormal returns. In particular he argues that E/P studies are likely to measure model misspecification whereas EPS studies are likely to measure the informational efficiency of the market. He concludes that the empirical results are more consistent with the hypothesis of model misspecification and market efficiency than with any other.

A small number of studies have recently appeared which use Ball's analysis as a framework for designing tests of the EMH. In this issue of QIS we will discuss two papers of this type.

Watts (*Journal of Financial Economics,* June/September, 1978) attempts a direct examination of the informational efficiency of the market. His methodology uses unexpected earnings to rank stocks and focuses on properties of sophisticated statistical techniques (Box-Jenkins) for defining expected earnings in order to reduce or eliminate the impact of omitted variables in the risk adjustment process. Two portfolios are constructed. The first is composed of positive, the second of negative, unexpected earnings stocks. Portfolio weights are defined so that both portfolios have a beta of one. Abnormal return is defined as the difference in returns of the two portfolios. Reported results show small though statistically significant abnormal returns in the period 1962-65 but not in the period 1965-68. The abnormal returns in the first period are sufficiently small so that only a broker could have made economic profits based on the inefficiency. Watts' results are not seriously inconsistent with the Ball hypothesis.

A direct test of Ball's conjecture was provided by Reinganum (Unpublished manuscript, University of Chicago, 1979). Reinganum's study uses quarterly corporate earnings for 566 companies all with fiscal years ending in December. The study period covered 1976-77. Earnings announcements data was hand collected primarily from the *Wall Street Journal.* This procedure was designed to eliminate data problems associated with earlier studies.

In the first part of Reinganum's study, securities were ranked and two portfolios formed from the twenty highest and lowest (non-negative) E/P ratio stocks. Prices used in the ratio are those available at the end of the quarter corresponding to the period associated with the earnings announcement.

Therefore, prices do not reflect information associated with the actual announcement of quarterly earnings. Portfolio weights are constructed so that both portfolios have a beta of one. Abnormal returns are defined as the difference of returns of the two portfolios. Portfolios were purchased either at the end of the month immediately following the earnings announcement, or at the end of any succeeding three months. Abnormal returns reported were statistically significant, consistent on a day-by-day basis, persisted over a fifty trading day time horizon and were relatively insensitive to time of portfolio purchase. The magnitude of the abnormal returns averaged approximately 0.1% per day or approximately 6% to 7% per quarter. The results are strikingly consistent with the model misspecification hypothesis and the notion that earnings yield is a measure of persistent phenomena omitted in the return model.

Reinganum also constructed a measure of abnormal returns based on unexpected earnings in a manner similar to Watts except for the model which estimates expected returns which is taken from a study by Latane and Jones (*American Finance Association,* Annual Meeting, 1977). Forty percent annual abnormal returns were reported in the original study. Reinganum's study differed primarily on the basis of data collection method and time period analyzed. Reinganum found, however, no statistically significant abnormal returns. Reinganum's results are in marked contrast to those of Latane and Jones and are consistent with the Ball conjecture of informationally efficient markets.

An evaluation of empirical data must always consider the fact that test results are method, universe and time period dependent. Corroboration of Reinganum's findings in particular requires an analysis of other and longer time periods, as well as an examination of other models for estimating expected earnings. However, it is difficult not to be impressed with both the magnitude and the consistency of the abnormal returns for the earnings yield study. The contrast in the results of Reinganum's earnings yield and unexpected earnings studies, both of which use the same earnings data and where portfolios are formed and returns analyzed over the same time period, is also impressive.

One further point is relevant to this analysis. Charest (*Journal of Financial Economics,* June/September, 1978, pp. 318-19) points out that the Ball conjecture implies an important interpretive problem for tests results which are consistent with the EMH. If we assume that the return generating process is misspecified, then any test of market efficiency which uses risk adjustment in its analysis and finds results which are consistent with the EMH must further show that the risk adjustment process had no serious effect on the results. While both Charest and Watts note this problem in their analysis, no satisfactory solution is available.

In summary, the Ball hypothesis seems to be, in general, supported by available empirical data. In particular, model misspecification with respect to CAPM has important supporting evidence. Nevertheless, results concerning the informational efficiency of the market remain open to doubt. The Charest paradox serves as a warning against a too facile resolution of the issues raised by the empirical data we have examined.

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