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A Model to Explain Shareholder Returns: Marketing Implications

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This study attempts to lend empirical evidence to the relevance of the arbitrate pricing theory in providing economic interpretation to stock market factors. A multistage model to explain the stock returns of a representative set of U.S. companies is developed. Monthly returns data for individual securities are obtained and the cross-sectional interdependencies between securities are identified. The returns of the securities are found to be related to at least three, and possibly four, factors. The hypotheses related these factors to broad economic aggregates such as cost and supply of money, in addition to the market return index. The presence of idiosyncratic industry effect in the market is also demonstrated. The replication of the analysis with another sample from a different time period yields similar results. Marketing implications are drawn based on the findings of this study. J BUSN RES 2000. 50.157–167.

Every organization has multiple stakeholders-employees, shareholders, and management, to name a few whose performance expectations may be different. Shareholders may believe that organizational performance is excellent if the earnings per share is high; management may be satisfied with a performance that meets internal rate of return, profitability, and market share requirements; and employees may be satisfied if organizations have the ability to meet their salary and promotion expectations. The multiple constituency perspective is best illustrated by Lloyds Bank which reported a big loss in 1989, yet the CEO claimed it was a good year for the shareholders.

Most previous research on organizational performance has adopted the perspective of management and examined the effects of several strategy and process factors on performance measures such as profitability and market share. For example, the strategy literature has primarily been concerned with how organizations perceive the markets they operate in and make decisions regarding the posture to adopt in those markets (Porter, 1980). The organization behavior literature, on the other hand, has focused on the contingent relationships between design and performance.

Based on the studies examining organizational performance from the shareholder's perspective, the general argument made is that stock returns are idiosyncratic and cannot be predicted. The focus of the present study is to address this assumption. Specifically, the present study develops a multistage model to explain the stock returns of a representative sample of companies listed in the New York Stock Exchange. In the first stage, the study uses capital asset pricing model (CAPM) principles to evaluate the common variation in stock returns with the market return index. In the second stage, the study uses a model based on the arbitrage pricing theory (APT) suggested by Roll and Ross (1995) to identify and evaluate the effects of two additional factors, namely the cost of money and the availability of supply of money. In the third stage, the study evaluates if there is a systematic variation in stock returns with the industry to which a particular company belongs.

Empirical support for the conceptual model of the study would indicate that stock movements are not idiosyncratic and can, in fact, be predicted (Ferson and Harvey, 1991). The significance of hypothesized factors in the present study may provide clear evidence of whether and to what extent movements in stock prices can be explained. Previous studies have shown the relationship between stock returns and measures of brand equity (e.g., market-to-book equity, corporate and brand reputation). If so, subsequent studies can enable researchers to

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evaluate the degree to which the factors governing stock returns are related to measures of marketing variables such as corporate and brand reputation and therefore, brand equity.

Motivation and Hypotheses

Early attempts at predicting stock returns were based on the CAPM. CAPM explains the common variation in stock returns in terms of a market return index. The systematic risk of the i^{th} security associated with market index, often denoted by β_i, is given by

$$\beta_i = \text{Cov}\ (R_i, R_m)/\text{Var}\ (R_m) \quad (1)$$

The CAPM assumes

$$E(R_i) = R_f + \beta_i\ [E(R_m) - R_f] \quad (2)$$

where R_f is the risk free rate of interest, and $E(R_m)$ is the expected rate of return on a market portfolio of securities, consisting of every asset outstanding in proportion to its total value. One can infer from CAPM that higher the value of β_i, the greater the impact of market variability on variability of returns on the security. Researchers have observed, however, that the CAPM is testable only because it is difficult to observe the exact composition of the true market portfolio.

Arbitrage Pricing Theory

The arbitrage pricing theory (APT) paradigm focuses on the covariance between asset returns and multiple factors in the return generating process. Compared to CAPM, APT which requires less restrictive and presumably more plausible assumptions, is more readily testable since it does not require the measurement of the market portfolio, and may be better able to explain the anomalies found in the application of the CAPM to asset returns (Dhrymes, Friend, and Gultekin, l984). APT hypothesizes that variations in stock values could be attributed to the presence of a few systematic components of risk (Brealey and Myers, 1996). The model postulates that

$$E(R_i) = R_0 + a_1b_{i1} + a_2b_{i2} + \ldots + a_jb_{ij} \quad (3)$$

where $E(R_i)$ is expected return on asset i, b_{ij} is the reaction coefficient describing the change in asset i's return for a unit change in factor j, R_0 is the return on an asset that is risk free because all its b_{ij}'s are zero, and a_j is the premium for risk associated with factor j.

The reaction coefficients that characterize an asset are estimated from a market model,

$$r_{it} = b_{i0} + b_{i1}d_{1t} + b_{i2}d_{2t} + \ldots + b_{ij}d_{jt} + e_{it} \quad (4)$$

where r_{it} is the return on asset i in period t, d_{jt} is the value at time t of the mean zero factor j common to the returns of all assets, b_{ij} is the estimated reaction coefficient of asset i to factor j, b_{i0} is the estimated return on asset i when all d_{jt} values are zero, and e_{it} is an error term with $E(e_{it}) = 0$ denoting residual risk. An important feature of APT is that it will not be useful if we are unable to identify these additional risk factors that are relevant and their definition.

Additionally, Dhrymes et al. (1984) raise an important concern regarding the number of relevant risk factors. Dhrymes et al. (1984) noted that: "If, after prolonged empirical investigations, the number of 'factors' found is stabilized, and an economic/financial interpretation is attached to them, we may, at that stage, think of such risk factors as reflecting fundamental economic forces at work in the securities market." This is the challenge that the present study has undertaken. If our attempt is successful, then marketers can monitor those economic forces to develop contingency plans to improve their firms' or brands' performance. In other words, APT attempts to measure the various dimensions of market related risk in terms of several underlying economic factors which systematically affect the price of all shares. Roll and Ross (1984) in their reply to Dhrymes et al. (1984) observe that an increase in the number of the stocks from the same industry could also increase the number of factors (industry effect). But they argued that such a factor would not be priced because it was not pervasive. Chan, Hamao, and Lakonishok (1993) conclude that it very well may be the case that returns are driven not only by market risk but also by a host of other factors.

Previous research has attempted to examine additional factors that may be relevant for asset pricing. Most of these studies derive the multi-factor specification by identifying systematic factors in the residuals obtained from single factor. Chen, Roll, and Ross (1986) explored a set of economic state variables as systematic influences on stock market returns and examined their influence on asset pricing. Several of the economic variables they chose were found to be significant in explaining stock returns. The primary concern with most previous research has been the ad hoc nature of the conceptualization of risk factors. Brennan (l98l), in his discussion of Oldfield and Rogalski's (l98l) article, referred to ad hoc manipulation of data and attempts to correlate factors with other economic time series without any underlying theoretical structure. Chen (1983) suggests that providing an economic interpretation of the common stock market factors should be the most important direction for future research. Chen et al. (1986) acknowledge the fact that they have not used all the influential economic variables.

Recently, Elton, Gruber, and Mei (1994) identified five principal factors that could affect either the cash flows themselves or the discount rate of the cash flows. These five factors include yield spread, interest rate, exchange rate, real GNP, and inflation. Thus, there is increasing evidence that there are systematic factors that affect the expected returns. The challenge is to provide a consistent meaning to the systematic factors found in the stock returns. In fact, Shanken (1992) calls for a new direction of empirical work on APT. A major advantage of identifying the economic factors is that marketing managers of mutual fund companies can anticipate and buy