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STOCK RETURNS,
EXPECTED DIVIDEND,
AND REAL
ECONOMIC ACTIVITY

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INTRODUCTION

It has been widely accepted in the literature that a strong relationship exists between the aggregate economic activity and the stock market returns. Fama showed that stock market returns are positively related to the subsequent rate of growth of real GNP (Fama, 1981). Benderly and Zwick repeated Fama's analysis with minor changes and reinforced Fama's results (Benderly and Zwick, 1985). Although they did not make any specific claims about the role of the stock market in the business cycle, the results of both these studies do imply that stock market returns can be a signal for future changes in real economic activity. Such a relationship arises probably because the changes in current stock prices take place because of the investor's attempt to forecast future earnings and these earnings are correlated with the state of the economy at that point. If this were true, we may then be able to understand the changes in stock prices better by going beyond the examination of the macroeconomic variables such as, the rate of growth of the real GNP, and by emphasizing the factors that have to do with the valuation of stocks by investors. This would mean shifting the emphasis from a macro to the micro level for the analysis of stock market returns. At a micro level of analysis, Peavy and Goodman tried to explain the observed decline in real stock returns during the 1966-1981 period and identified two factors not yet discussed in the earlier works: corporate debt ratio and corporate profit

margin (Peavy and Goodman, 1985). Also, Reilly shifted the emphasis from the macro to the micro level while trying to look at the relationship between inflation and stock prices at an industry level (Reilly, 1987). In that study, conducted for a database of forty seven different industries, it concluded that, for identifying an industry as an inflation hedge, the critical variable to examine is the return on equity and, specifically, the profit margin. These two lines of reasoning, the macro and the micro, in conjunction imply that recent changes in stock returns should be interpreted in both macro and firm-specific grounds. The purpose of this paper is to examine empirically the simultaneous contributions of both the macro and the micro level factors to stock returns.

A FRAMEWORK FOR ANALYSIS

The conceptual framework for this analysis is based (a) on the Dividend Valuation Model, and (b) on the macro level literature.

On the basis of the Dividend Valuation Model modified in the context of infinite period valuation, stock returns are equal to a sum of the ratio of the expected dividend to the current stock price and the long term growth rate of the dividends. In the long run, the growth rate of dividends and that of earnings may be assumed to be equal, and assuming no external financing the growth rate of earnings is equal to the product of the retention ratio and

the return on equity. The return on equity can be divided into its three components: the corporate profit margin, the total asset turnover ratio, and the corporate debt ratio. Although it is possible to relax the external financing assumption at a firm level (Gordon, 1974), data availability may be a problem at an aggregated stock market level of analysis. This model, therefore, identifies at a micro-level, the following variables that influence stock returns:

1. the ratio of the expected dividend to the stock price (DVYD),
2. the retention rate (1 - DPR),
3. the corporate profit margin (PM),
4. the total asset turnover ratio (ATR), and
5. the corporate debt ratio (DEBT).

Next, on the basis of the literature emphasizing the macro variables, the factors of interest are the growth rate of real GNP (Fama, 1981) and the inflationary factors (Geske and Roll, 1983, among others). In contrast to the discussion in the earlier paragraph, the macro variables do not come out of any clearly defined model; it has been more of an exploratory in nature. Although there is sufficient agreement on the relationship between the stock returns and the real economic activity, there has been discussions, for example, as to whether the relationship between the stock returns and inflation is spurious because of the relationship of both of these variables with the real economic

activity (Fama, 1981). As a result, quite often the current growth rate of the monetary base has been used along with the inflationary variables to control for inflation. Within these limitations, the macro literature indicates that the following variables are worth including for an analysis of stock returns:

1. the growth rate of real GNP (QR),
2. the current growth rate of monetary base (MBGR),
3. the real risk free rate (RRFR),
4. the expected inflation (EIR), and
5. the unexpected inflation (UIR).

Out of these variables, the real risk free rate has been measured by the difference between the 91-day Treasury bill yields and the actual inflation rate based on the Consumer Price Index. Next, the expected inflation rate has been measured by the rate based on the 12-month CPI forecast in the Livingston survey.

On the basis of the discussions in the preceding paragraphs, the following specification is adopted for stock market returns:

Stock Market Returns, $SMR = f(\text{Variables identified in the Dividend Valuation Model and the macro studies})$.

ANALYSIS AND RESULTS

We gathered annual data for the 1954-1985 period. The Standard and Poor's 400 index was chosen as a proxy for the stock market portfolio. Most of the S&P 400 data were gathered from the S&P's

Statistical Service and its Analyst's Handbook. We used the Fortune 500 Industrials index as a proxy for the market portfolio for the data on the profit margin, the total asset turnover ratio and the debt ratio and gathered these data from various issues of Fortune. Furthermore, we obtained the Livingston survey data from the Federal Reserve Bank of Philadelphia and the monetary base data from the Federal Reserve Bank of St. Louis. Finally, we collected the real GNP data from the Business Conditions Digest.

We used an ordinary least squares regression analysis and obtained the following equation:

$$\begin{aligned} \text{SMR} = & -0.367 \text{ DPR} - 1.118 \text{ MBGR} + 1.156 \text{ RRFR} + 0.157 \text{ ATR} \\ & (1.453) \quad (1.146) \quad (0.953) \quad (1.284) \\ & + 0.911 \text{ QR} + 2.095 \text{ QR}(1). \\ & (1.064) \quad (1.992) \end{aligned}$$

Adjusted R-square = 0.18; D.W. = 2.12 ; numbers in parentheses are t-statistics.

We found that the growth rate of real GNP with a one year lead was the only significant variables in this equation.

DISCUSSIONS

The results of our analysis indicate that there is a significant relationship between the current year's stock market returns and the next year's GNP growth rate. This relationship arises probably because the changes in current stock prices take place because of the investors' attempt to forecast future earnings and these earnings are correlated with the state of the economy at that point. Our results, which are consistent in general with those of Fama, and Benderly and Zwick, would then imply that the stock prices turn before the economy does and thus the stock price changes could be used as predictors of business cycles.

Our results, however, are not consistent with those of Peavy and Goodman. Along the lines of Peavy and Goodman, we looked at the "reduced form" where the return on equity is replaced in the regression equation by its components: the profit margin, the total asset turnover ratio and the debt ratio. Out of these three components, their equation showed a significant relationship with the debt ratio. Unlike their results, we did not find any significant relationship between the stock market returns and the debt ratio. This might be partly because of a longer period of 36 years we covered in our analysis compared to their coverage of 16 years. Since the debt ratio may influence the changes in stock

prices either in a positive or a negative way depending upon whether its effect on the growth rate of dividends or that on the return required by investors becomes relatively more prominent, the direction of the relationship was probably more consistent during the relatively short period that their analysis covered.

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