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Economic Influences on the Stock Market

Nate Taulbee '00
Illinois Wesleyan University

"Economic Influences on the Stock Market"

By Nate Taulbee

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Advisor: Dr. Carolyn Stumph

I. INTRODUCTION

"It's the economy stupid!" This slogan from Bill Clinton's 1992 Presidential

campaign acknowledges the importance of the U.S. economy in American politics. This

slogan might also resonate loudly on Wall Street and among investors across the world.

In many ways the performance of the economy influences the success of the stock market

and vice versa. This study will examine the impact that various economic factors have on

the stock market. Specifically, it will ask the question, "How do interest rates, real GDP,

and the Fisher Effect impact the S&P 500?". In addition, this study will assess the impact

of these economic factors on various industries including a utilities, transportation,

financial, and technology index. The results of this study will help investors understand

just how important these economic variables are in influencing both the overall market

and major industries.

The following sections of this paper further examine the issues raised. Section II

offers a theoretical analysis of how real GDP, unemployment, and the Fisher Effect

should impact the S&P 500. Section III provides information on the expected

relationship between the economy and the following major industry categories: growth,

cyclical, defensive, and interest-sensitive. Section IV introduces the research design

including the generalized least squares model. Section V presents the results and

examines the appropriate econometric specification. Section VI concludes the study and

reiterates important findings.

II. THEORETICAL MODEL

Over the past 40 years a significant amount of research has been conducted on the

overall stock market. Included in many of these studies is the rational expectations

hypothesis that John Muth developed in 1961. The rational expectations hypothesis offered a new perspective on the formation of prices. The general idea behind this hypothesis is that economic agents use both past experiences and their expectations and predictions of the future to determine the price of an asset today. According to Stephen Sheffrin's book titled Rational Expectations, "Expectations are rational if, given the economic model, they will produce actual values of variables that will, on average, equal the expectations." The rational expectations hypothesis does not, however, require that all economic agents have identical expectations. Instead, the weighted average of these agents' forecasts will provide the expected value of the actual variable (Sheffrin, 1996).

Like other research on the stock market, this study will use the rational expectations hypothesis in the proceeding theoretical model. For this study, the economic agents forming expectations about the future value of stock prices will be stock market investors. Because the rational expectations hypothesis assumes that investors take all information into account, both expectations variables and coincident indicators will be incorporated into the model. Coincident indicators are variables that provide an assessment of economic conditions at the present time. For example, the most recent unemployment figure released represents the current amount of unemployment in the United States today and is, therefore, a coincident indicator. The remainder of this section will examine the variables in the model in more detail.

A. The Fisher Effect

Irving Fisher found that real interest rates were equal to nominal interest rates minus expected inflation. This macroeconomic relationship is known as the Fisher Effect (Mankiw, 1997). The Fisher Effect is unique in that it incorporates expected inflation as

opposed to actual inflation rates into the equation. This is of interest to many economists because it allows them to use rational expectations models in their studies. One such economist, Yu Hsing, studied the Fisher Effect and discovered that nominal interest rates have a non-linear positive relationship with expected inflation when the Federal Funds rate was used (1997). These findings will be incorporated into the empirical model in Section IV.

The Fisher Effect is primarily an alternative way of measuring real interest rates and will be used as a means of relating interest rates and inflation expectations to stock prices. To fully understand the relationship between the Fisher Effect and stock prices, it is necessary to understand the individual relationships between inflation expectations, interest rates, and the stock market.

1. Inflation Expectations

Since the introduction of the rational expectations hypothesis, many studies concerning inflation expectations have been completed including Douglas Pearce's "An Empirical Analysis of Expected Stock Price Movements" in 1984. Using the Livingston survey, a survey of business, government, and academic economists, Pearce found that, prior to 1972, investors expected nominal stock prices to rise with the general price level because they felt it was a good hedge against inflation. However, after 1972, Pearce found that the relationship between stock prices and inflation expectations became less significant. A likely reason for this is the volatility of the US economy and the inflation rate increase in the 1970s due to the OPEC crisis (Pearce, 1984).

A study conducted by Michael Niemira and Philip Klein supports the changing relationship between inflation expectations and the stock market that Pearce observed

after 1972. They found that an inverse relationship existed between inflation expectations and the stock market when using the leading indicator of inflation as their data source for inflation expectations (Niemira and Klein, 1994). Although no reasons were cited, the likely cause of the inverse relationship between inflation expectations and the stock market is that the Federal Reserve will likely change interest rates in order to influence a potential change in inflation. Because this study examines the relationship of the economy and the stock market since 1972, an inverse relationship between inflation expectations and the S&P 500 is predicted. The following section will explain in greater detail how changes in interest rates affect stock prices.

2. Interest Rates

William Breen, Lawrence Glosten, and Ravi Jangannathan completed a study of the relationship between the Treasury bill rate and the stock market in their article titled, "Economic Significance of Predictable Variations in Stock Index Returns." In their study, the authors found that an inverse relationship between stock index returns and Treasury bill interest rates exists when a value-weighted stock index is used. The reasoning behind this negative relationship is that, when interest rates rise, the expected earnings streams of S&P 500 firms on the whole declines because of the higher cost of borrowing and financing expenditures. Because earnings reports play a dramatic role in stock prices, a rise in interest rates that adversely affects earnings reports will lead to lower stock prices (Breen, Glosten, and Jagannathan, 1989). In summary, the Fisher Effect should have a negative relationship with the S&P 500.

B. Gross Domestic Product (GDP)

The fundamental measure for the performance of the economy is the level of

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gross domestic product, or GDP. GDP measures the total income in an economy earned domestically, including the income earned by foreign-owned factors of production (Mankiw, 1997). GDP is important to the stock market in that it serves as a measure of the health of the economy. As a rational stock market investor, a rise in the level of GDP (a positive growth rate) from one period to the next would suggest that firms on the whole are performing positively. This aggregate performance of firms allows for more reinvesting which should ultimately lead to higher future earnings and stock prices.

An increase in GDP from one period to the next should also increase the level of the stock market because consumers in general have more purchasing power and would likely devote more income toward stock market investing, ceteris paribus. In this regard, GDP acts as a proxy for purchasing power ability of investors.

C. Unemployment

In addition to GDP, the unemployment rate is another common measure for the health of the economy. A high unemployment rate results in a lower sense of financial security for the unemployed for obvious reasons. However, high unemployment rates also raise concerns for the employed because their employment status is also in jeopardy in a climate of downsizing and layoffs. This decline in financial security by both the employed and unemployed due to an increase in the unemployment rate will lead to less investment in the stock market as investors try to find safer means of saving their income. Thus, the unemployment rate serves as one of the key signals to investors of the health of the economy. The predicted sign of the unemployment coefficient is negative.

III. APPLICATION OF THEORY TO INDUSTRIES

Some sectors of the stock market perform better than others given the same

economic conditions. In the recent economic boom, new economy stocks such as technology stocks have generally outperformed old economy stocks such as Wal-Mart and the Coca Cola Corporation. Understanding the relationship between the economy and different industries allows investors to narrow their focus when deciding where to allocate their resources. Charles P. Jones, author of <u>Investments: Analysis and Management</u>, believes, "Industry analysis pays because industries perform very differently over time, and investor performance will be significantly affected by the particular industries in which investors select stocks" (1998 p. 440). Jones also believes that there is a definite link between the business cycle and the stock performance of different industries and stated the following:

> Clearly, business cycle analysis for industries is a logical and worthwhile part of fundamental security analysis. Industries have varying sensitivities to the business conditions and interest rate expectations at any given time, and the smart investor will think carefully about these factors. (p 452)

This section will explore how real GDP, unemployment, and the Fisher Effect impact the general industry categories classified as cyclical, defensive, interest-sensitive, and growth.

A. Cyclical Industry

Cyclical industries such as capital goods and consumer durables follow the business cycle closely. When the economy prospers, cyclical stocks do very well. However, during times of poor economic conditions and recessions, cyclical stocks are likely to suffer more than all non-cyclical stocks. For example, during the 1990 recession, cyclical stocks declined three times more than the S&P 500 (Jones, 1998). The

expected relationship between economic growth, unemployment, and the Fisher Effect on cyclical stocks is the same as it is on the overall market. However, the degree of these relationships should vary for cyclical stocks relative to the overall market because of the fact that cyclicals are more responsive to the business cycle.

B. Defensive Industry

Just as cyclical industries are most affected by recessions and economic conditions, defensive industries are least affected by the state of the economy. Examples of defensive industries include pharmaceuticals, food and beverages, and utilities (Reilly and Norton, 1999). No matter how bad the economy is, people will continue to eat, drink, and use basic utilities. Therefore, as found by Frank Reilly and Edgar Norton, two finance researchers, "Defensive industries generally maintain their values during market declines" (1999 p417). The relationship between economic factors and the utilities industry should be less significant than that of other industries and the overall market.

C. Growth Industry

Earnings of growth industries are expected to be much greater than earnings in all other industries. In addition, growth industries often have increased earnings regardless of the status of the economy. In the 1980s the major growth industries were genetic engineering, microcomputers, and new medical devices (Jones, 1998). Today, the major growth industries are technology, biotechnology, and Internet-infrastructure. It is expected that growth industries will perform extremely well when the economy is sound and may continue to perform well when the economy suffers. Therefore, real GDP, unemployment, and the Fisher Effect should have a less significant impact on growth stocks.

D. Interest-Sensitive

Interest-sensitive stocks are most affected by expectations about changes in interest rates. Interest-sensitive industries include the financial services, banking, real estate, and building industries (Jones, 1998). For example, if interest rates increase, individuals are less likely to move or build new homes, which means less business for construction companies, real estate agencies, banks, and other financial services companies. It is hypothesized that an increase in interest rates will cause interest-sensitive industry's stock price to decline.

IV. RESEARCH DESIGN

A. Dependent Variables

1. S&P 500 Index (sp500)

The S&P 500 index is a major U.S. stock market index that consists of 500 stocks. The chief advantage of using the S&P 500 over the more often quoted Dow Jones Industrial Average (DJIA) is that it is more representative of the entire market because it contains a larger number of stocks. In addition, the S&P 500 index is value-weighted whereas the Dow Jones is a price-weighted index. Thus, high-priced stocks carry more weight with the DJIA than with the S&P 500 (Jones, 1998). This study will use end-of-month S&P 500 index values from January, 1972, to August, 1999 as the data source for this dependent variable. The Economagic.com website will provide the S&P 500 data.

2. Dow Jones Transportation Average (Transp)

The Dow Jones Transportation Average (DJT) consists of 20 airline, rail, and transportation services companies that represent the transportation industry as a whole. [A complete listing of the 20 companies is contained in Appendix A]. The DJT will

serve as a proxy for a cyclical industry because it is plausible to expect less transportation during recessions and more transportation during boom periods. For instance, when individuals and families are operating on tight budgets, it may not be necessary to pursue a "weekend getaway" vacation. Many corporations operating on tight budgets might also not decide to send as many employees, if any, on a company trip. Instead, especially with today's technological advancements, which include videoconferencing, an expensive plane ticket during peak hours may not be necessary. Data for the DJT is end of month data from January, 1972, to August, 1999. Yahoo! Finance is the source for the data (www.finance.yahoo.com).

3. *Dow Jones Utilities Index (Utility)*

The Dow Jones Utility Index (DJU) includes various utilities companies including major energy and electricity providers throughout the U.S. [Appendix B contains a complete listing of the 15 companies that make up the DJU]. The DJU will serve as a proxy for the defensive industry because of the fact that utilities are used regardless of the status of the economy. Data for the DJU is end of month data from January, 1972, to August, 1999. Yahoo! Finance is the source for the data (www.finance.yahoo.com).

4. *Pacific Exchange Technology Index (Tech)*

The Pacific Exchange Technology Index (PSE) includes end-of-month data from February, 1984, to August, 1999. The PSE will serve as a proxy for a growth industry index. The PSE will be used over other growth indices because of the difficulty of obtaining inexpensive historical data on growth industries. Yahoo! Finance is the source for the data (www.finance.yahoo.com).

5. *Financial Services Index (Financial)*

The Fidelity Select Brokerage & Investment Fund (FSLBX) is a mutual fund that includes several major brokerage and financial services companies including Morgan Stanley Dean Witter, Charles Schwab, Merrill Lynch, and American Express. The fund has been in existence since January, 1987, and will serve as a proxy for an interest-sensitive industry index. Due to the lack of free historical data for a major financial stock index, this study will use FSLBX fund. The FSLBX fund provides end of month historical data that can be obtained from the Yahoo! Finance website (www.finance.yahoo.com).

B. Independent Variables

1. *Real GDP (RGDP)*

Real GDP will be used instead of nominal GDP because real GDP values the total output of the economy measured at constant prices. Therefore, real GDP changes from year to year if the quantities produced change. Theory suggests that real GDP should have a positive significant impact on the performance of most stock indices. However, theory also suggests that the magnitude of real GDP's impact should vary across stock indices. For example, real GDP should have a greater effect on growth industries than on cyclical and interest-sensitive industries. The real GDP data is indexed for 1992 dollars and is supplied by the economagic.com website (www.economagic.com).

2. *Unemployment (UNMPLOY)*

The unemployment rate is announced monthly and is simply a measure of the