

# Change in Earnings that led to Change in Stock Prices

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## ABSTRACT

The efficient market hypothesis theory states that stock prices completely reflect all available information, but it does not tell us about the change in information that leads to change in stock price. In order to find the magnitude four regression were carried out. Their results were statistically not significant and conveyed that the efficient market hypothesis is right.

## **Introduction**

The efficient market hypothesis by Fama (1960) states that the financial markets reflect all available and accessible information. The theory focuses on common stocks, stating that the stock price reflects all the available information of the company. Events such as mergers, earnings reports, stock splits, etc, are information about the company that affects the movement of the stock price, and the market that reflects all available information is called "efficient". Investors search for stocks that are mispriced and their trading makes the market efficient over time. The efficient market hypothesis is related to the idea of "random walk" which is a term used in finance. The logic of the random walk idea is that if the flow of information is unimpeded and information is immediately reflected in stock prices, then tomorrow's price change will reflect only tomorrow's news and will be independent of the price changes today. But news is by definition unpredictable, and, thus, resulting price changes must be unpredictable and random. Prices reflect all available information, and "even uninformed investors buying a diversified portfolio at the tableau of prices given by the market will obtain a rate of return as generous as that achieved by the experts." (Malkiel, 1989).

One of the examples of deviations of the efficient market hypothesis is the bandwagon effect, which is a part of psychological finance, states that if individuals see a stock price rising, they are drawn into the market which creates a bandwagon effect, making the stock price inefficient by pushing the stock price higher and vice-versa. The efficient market hypothesis theory does not tell us the magnitude effect of earnings with respect to stock price. Earnings which are released every quarter by companies are information that affects the movement of stock price, in the long run and short run.

The efficient market hypothesis theory says that stock prices reflect all available information of a company, but the theory does not state or tell the change in earnings that lead to change in stock prices, which is an important information because it can help investors pick the right stock and add it into their portfolio and vice-versa with companies that incur losses. The results obtained from the four regressions in the research are statically not significant. this conveys that the markets are elastic. But with more data and time the results can be more precise to the estimate. This information is helpful for investors and traders to predict the direction of a stock.

## **Literature Review**

The following topics are discussed since they are some of the topics and flaws of the efficient market hypothesis theory.

## Long-Run Return Reversal

Long-Run return reversals can be seen in all markets. It is when the stock price deviates from its fundamental values and later to exhibit mean reversion is known as long-run return reversals. In the short-term, the returns from stocks is a positive correlation, but many studies have shown negative serial correlation which is return reversals over long periods. "Investors are a subject to waves of optimism and pessimism that causes prices to deviate systematically from their fundamental values and later exhibit mean reversion." (Malkiel, 1989). This causes long-run return reversal.

## Day to Day Trading has Lasting Effects on Stock Markets

In a recent paper by Gabaix and Koijen (2021) study how America's stock market responds to buying and selling. Their findings were that an inflow of a dollar into the equities increases the value of the market by \$3 to \$8. These results state that markets are not elastic and Messrs Gabaix and Koijen call this "inelastic markets hypothesis." This has been one of the major recent findings, if day to day trading has lasting effects on the stock market, if it's right then the efficient market hypothesis theory maybe wrong. The main finding out in research was that the markets could be inelastic. That they are affected by cash flows from hedge funds and their trades amplify market movements.

## January Effect

Many in Wall Street have tried finding patterns or correlation or any relation between stock prices and their returns. One of the patterns, the January Effect- where an investor can earn high returns if he had invested in December and held it until January and sold those stocks in mid-January. This effect was observed first by an investment banker Sidney B. Wachtel. The main reason behind this is due to hedge fund managers and investment bankers who sell their stocks at the end of the year to square off their profits and loss, this would lead to a downfall in stock prices. Due to mispricing in stock prices, traders start buying the stocks that are undervalued making the stocks efficient and giving high returns to traders who purchased these shares in December. But as the January effect was published and as more and more traders got to know about this effect, the pattern faded away.

## Can Future Returns be Predicted from Initial Dividend Yields?

The U.S stock market S&P 500 Stock Index dividend yields have been at 3 percent level or below since the mid 1980's, though the dividend yields have risen up later on in the 2000's. This could be due to adjustment of the stock market with the general economic condition. Usually, dividend yields of stocks tend to be high when the interest rates are high and vice-versa. And in general investors and traders have obtained higher returns from stocks that's offered higher initial dividends and lower returns with stocks that offered lower initial dividends. But this phenomenon does not work consistently where investors purchase a portfolio with only stocks that are giving out the highest dividends. They do not earn high returns particularly. Returns from stock have been predictable in the past to an extent. A successful high dividend strategy is the "Dogs of the Dow Strategy", where investors need to buy the top 10 highest dividend paying stocks and hold them. This strategy had worked and more mutual funds had followed the strategy, but they under performed during 1995-1999 period. Thus, we can say that future returns cannot be completely predicted from initial dividend yields and that the markets are efficient and trader or investor cannot earn excessive returns, which is what the efficient market hypothesis says.

## Psychological Influences on the Stock Prices

Can the October Crash of 1987 be a dominance of psychological factors than logical factors? Over the period of time, some investors and traders believed that there are a few psychological factors that affect stock prices, such as the bandwagon effect. Where investors are drawn into the stock due to big movements in its price. But the October crash could be due to change in the investors view when the yields on the long-term Treasury bonds increased from 9 percent to 10.5 percent in two months prior to the October Crash of 1987. Early in the month congress had threatened to impose a merger tax, that would have would have made mergers between companies expensive. The risk in merger activity had increased the risk in the stock market by weakening the corporate management.

James Baker the Secretary of the treasury had told people to encourage a further fall in value of dollar. This increases risk for foreign investors and frightening both domestic investors and foreign investors. All this news increased the risk in equities and by mid-October investors and traders believed that they were holding too much of their wealth in risky equities. As Merton Miller (1991) has written "...on October 19, some weeks of external events, minor in themselves.... cumulatively signalled a possible change in what had been up to then a very favourable political and economic climate for equities and many investors simultaneously came to believe they were holding too large a share of their wealth in risky equities." There were a few crashes and bubble bursts in the stock market, but markets have been efficient in the long-run and they do reflect all available information.

## Data

Data of earnings per share was obtained from Morning Star and stock prices at the time of earnings call was gathered from Google Finance. Earnings per share (EPS) of twenty companies from the S&P 500 was recorded for four quarters of the year 2021. The prices of each stock for four different quarters were recorded at the time of the earnings call of each company. The next day after the earnings call of each company was recorded to observe the effect of earnings on the stock price. Companies whose EPS and stock prices that were recorded are as follows,

A (Agilent Technologies)  
AAP (Advance Auto Parts)  
AAPL (Apple)  
ABBV (AbbVie)  
ABMD (Abiomed Inc)  
ABT (Abbott Laboratories)  
ACN (Accenture)  
ADBE (Adobe)  
AES (The AEC Corp)  
AFL (Aflac Inc)  
AKAM (Akamai Technologies)  
ALB (Albemarle Corp)  
AKL (Alaska Air Group Inc)  
AMCR (Amcor)  
AMZN (Amazon)  
AOS (A.O. Smith Crop)  
APD (Air Products and Chemicals)  
ARE (Alexandria Real Equities Inc)  
ATVI (Activision Blizzard)  
GM (General Motors)

There were 4 quarters and 4 earnings per share observations that were recorded. PE ratio as on November 2021 of all the companies above was recorded to control the variable bias during regression. The percent differences of prices between each quarter were calculated and recorded along with the change in earnings per share (EPS). The differences were calculated with the help of Stata.

## Results

Regressing the log difference in stock prices from each quarter and the earnings per share of a company of the previous quarter, gave us a coefficient of 0.006. This was done to check for the efficient capital market hypothesis theory. As the coefficient is 0.006, it is statistically not significant, which means that an investor or a trader cannot earn excess returns by just looking at the current earnings per share. The P-value is at 0.419 which means that there is 41 percent of probability of getting a coefficient greater than 0.006 if the same regression was done with a different set of data or with more data. Regressing log difference in stock prices, EPS and assigning a constant to each firm to create a fixed effects model. A coefficient of -.017 was the result for difference in earnings per share. This regression is carried out to keep other factors constant, it is carried out to check for an omitted variable bias. Since the value of the result is very minimal, it is considered statistically not significant and a P-value at 0.451, which means that there is a probability of 45 percent of obtaining a result more than -.017 absolute value, if the same regression was done with a different set of data. This means that if earnings per share had increased by 1 percent, then there would be a -1.7 change in stock prices.

The regression results with the fixed effects model were like that regression results of log difference in stock prices and log earnings per share, their variation was not of a much greater value. This again conveys that the markets are efficient and the efficient market hypothesis theory is correct. Regressing log difference in earnings per share, log differences in price and with the latest PE ratio was done to check if overvaluation of stock prices had any effect in change in earnings per share that had led to change in stock price. This was done to try and control an omitted variable bias. In this scenario PE ratio was taken to know whether a stock was overpriced or not and our assumed omitted variable bias was overvaluation of stock prices. The results we got were similar to the results that were obtained while regressing the difference in earnings per share and the difference in stock prices (1). With a coefficient of .0058945, which is statistically not significant and P-value at 0.771, which means that there is a probability of 77.1 percent of obtaining a result more than .0058 absolute value, if the same regression was done with a different set of data. The results tell us that PE ratio does not seem to be an omitted variable, therefore it is not generating an omitted variable bias.

Regressing differences in earnings per share and stock price, a coefficient .015355 was the result obtained. The result is considered statistically not significant and with P-value at 0.505, which means that there is a probability of 50.5 percent of obtaining a coefficient greater than zero, if the same regression was carried out with a different set of data. This means that the change in earnings and stock prices was not of much great variance and that the efficient market hypothesis theory is right.

## Discussion and limitations

A few of the limitations that I had come across while carrying out the research was data, it was hard to be found, had to be done manually and time consuming. What would be the result with unlimited data and time to carry out the research? We could have found the exact percentage of change in earnings that led to change in stock prices. This can help any investor or trader to make money using swing trade techniques earning him returns that are unexpected in the short-run, but as long run return reversal takes place after the short period of time where any investor trader could make money with the more data and time.

With more data the results would also be precise, this allows investors or traders to know when to enter and exit positions allowing them to earn profits. Note that the bandwagon effect would also come into place, pushing the stock higher or lower, which depends on the earnings of the company. This way the investor or the trader knows that he should be expecting movement of the stock price to be of a much greater value. Can there be any other effects that show deviation of the results with real life trading scenarios? Yes, there can be some factor that can affect the predicted value of the stock price after change in earnings. It could be due to factors such as natural disasters, companies such as Evergrande announcing bankruptcy or any other new information that draws too much attention to itself can be the factor, where now the stock price becomes unpredictable. If an investor or a trader keeps checking on the company's latest news and information, then there is no need to worry as the results will work, he just needs to enter into the position and exit after the right percentage of expected stock price growth was obtained. The trader or the investor should be careful due to overnight changes in the company, which can happen within some companies and that's the risk the investor or trader is taking to earn returns in the short-term.

## Conclusion

The efficient capital market hypothesis theory tells us that all available information of a company is reflected in the stock price of a company, but what if we could find the magnitude of the change in percentage of earnings that lead to change in stock prices. Though the four regressions gave a minimal magnitude of change in earnings that lead to change in stock prices, with more data and more time, the results can be more precise to the estimated value, allowing an investor or a trader to earn returns in the short run if he utilizes the situation in maximizing his returns. The result in the paper tells us that the efficient market+- hypothesis theory is right. The results of the four regressions are statistically not significant and convey that the efficient market hypothesis theory is right, but with more data and time the results can be more precise to its estimated value. As data is not free and is hard to gather, it is one of the few obstacles you can face with doing further research on this topic.

## References

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