

Do Past Changes affect Current Stock Prices in the Health Sector?

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Abstract. Investing involves sacrificing present resources for future gains, impacting decisions across various domains, from business to personal finance. This study delves into the rationale behind investing in stocks, exploring factors influencing stock pricing and investor behavior. While the stock market offers potential for financial growth, it also entails inherent risks, prompting investors to seek a favorable risk-adjusted rate of return. Despite the complexities of stock valuation, including considerations beyond projected earnings, such as market trends and investor sentiment, understanding these dynamics is crucial for informed investment decisions.

Keywords: Investing, Stocks, Financial Markets, Risk Management, Investor Behavior, Stock Pricing, Equilibrium, Market Dynamics, Contagion Effect, Financial Analysis, Earnings Forecast.

1. Introduction

Essentially, the purpose of investing is to give up something today, for something greater in the future. This central idea serves as a catalyst for decisions in many spheres of life, including the business world and personal endeavors. Companies, for example, give up some of their earnings to invest in machinery, computers, etc., that make the company more productive in the future. For individuals, the personal investment in education and training are made in the hope that they will pay off with higher future earnings. Financial investments, on the other hand, are in ‘paper’ assets such as stocks and bonds. When you buy a stock or other financial assets, you give up the money needed to buy it. The hope is that in the future the value of the asset will go up and you will have even more money. People tend to view the stock market as the most promising way to build wealth because they believe they have the most potential for financial gain of any financial product. We go beyond the basic concept of investing to discover why people choose to invest in stocks as opposed to other types of assets.

When we dive further into the world of stocks, we come across the fascinating dynamics of purchasing and selling. For a given stock, there are equal numbers of buyers and sellers at the current price, creating an equilibrium in the market for that stock. For example, on October 25, 2023, the closing price of Microsoft was 340.67 dollars. On this date there were just as many people looking to buy the stock at that price as there were people looking to sell it.

Changes in this buyer-seller balance are what cause price fluctuations in the stock market. If at the current price there are more buyers than sellers the price of a stock will rise. More sellers than buyers will drive the price down. The price will go up (or down) until there are an equal number of buyers and sellers at that price. This is the current equilibrium price. As opinions change there may be more buyers or more sellers, which will drive the price up or down until there are an equal number and a new equilibrium is found. One reason the stock market is so difficult to analyze is the notion of risk. For many other financial assets, the value is guaranteed to increase, so choosing investments boils down to determining which return is greatest. However, in the stock market, there is also the potential that an investment will lose value. So why do people invest in the stock market even though they must accept risk? They expect the risk adjusted rate of return to be greater than that of other available investments. But every purchase also has a seller who thinks some other form of investment will be better. The stock price is just an equilibrium where there are an equal number of buyers who think the stock is a good value as there are sellers who think it is not and therefore reflects the overall consensus of a large number of investors, taking risk into account.

We examine a few variables that affect investor choices in our effort to understand stock pricing. Although the value of a stock ideally should be determined by projections of future earnings, other factors may also influence the price. We hypothesize that people often react more to contagion rather than rational evaluations of available data. In many cases, it appears that investors react to the latest ‘hot’ trend in companies or even entire sectors of the economy. A recent example of this is the frenzy created over Gamestop 2021 where the stock price rose well beyond what most analysts felt was justified by the financial situation of the company. Due to their tendency to be influenced by past P/E ratios, earnings, and trends in stock prices, investors may fail to recognize the significance of projecting a stock’s future potential based on earnings forecasts. As a result, the stock market continues to be a complicated place where investors’ judgments are frequently influenced by their feelings rather than actual data.

2. Organization of the Text

2.1. Literature Review

A crucial component of making informed investing decisions is stock valuation, which helps investors determine the intrinsic value of a company’s shares. To ascertain the value of stocks, analysts use a variety of techniques. Three of these are the trailing price-to-earnings (P/E) ratio, the forward P/E ratio, and an analysis of recent price patterns.

Analysts frequently use the trailing P/E ratio, a fundamental metric, to assess the relative value of a stock. This ratio can be calculated by dividing the market price per share today by the earnings per share (EPS) for the previous period. An understanding of a company’s past earnings history can be gained from the trailing P/E ratio. It is a simple tool that reflects how much investors are willing to pay for a company’s earnings over the previous period and determines if a stock is overvalued or undervalued. For example, if the stock price is \$50 per share and the earnings per share is \$5, the P/E ratio would be \$10. This means that investors are paying \$10 for every \$1 of earnings. A higher P/E ratio indicates that investors are prepared to pay more money for every dollar of profit.

In contrast to the Trailing P/E ratio, which focuses on the past, the Forward P/E ratio puts more emphasis on future earnings. This measure is used by investors to evaluate the future earnings of a business, frequently taking the P/E Growth (PEG) ratio into account. The Forward P/E ratio is calculated by dividing the current stock price by the predicted future earnings per share for the next year. It is a forward-looking indicator that can let investors make assumptions about the performance of a company in the future. While the trailing P/E ratio is a straightforward calculation, it focuses on the past performance of the company. How this might carry forward to the future is a matter of opinion that can vary across different potential investors. However, the future P/E ratio also has uncertainties, since neither the future price of the stock nor earnings are known at the present time.

In addition to P/E ratios, evaluating previous stock price patterns can offer insightful information about the state of the market and prospective value changes. Analyzing stock charts can help identify trends that could affect the financial choices of investors. In this paper, we will investigate how market dynamics and investor behaviors have shaped recent patterns in stock prices in the health care sector and how these developments have affected our view of a stock’s overall value. We focus on how recent changes in both earnings and the price of a stock influence changes in the current price. Investors might find patterns and possible clues for future performance by studying past price movements.

2.2. The U.S Healthcare Industry

The Healthcare industry is one of the largest sectors of The United States economy. In 2020, healthcare expenditures reached \$4.1 trillion, which accounted for 19.7% of the nation’s gross domestic product (GDP). There are many types and sources of healthcare spending. Since the U.S. does not have universal health insurance, most individuals are responsible for their own coverage. Exceptions to this are Medicare and Medicaid. Medicare pays for most people aged 65 and older and

for certain permanently disabled individuals under the age of 65. Medicaid aims to support the low-income population, including children, pregnant women, adults, and individuals with disabilities. There is also medical insurance for military service members, provided by the Veterans' Administration (VA).

As a result, private insurance expenditures are a major component of healthcare spending in the U.S. Private insurance includes both employer-sponsored coverage and individual insurance purchased from insurers both on and off the health insurance exchanges. This is the main source of health insurance coverage in U.S.

Among all these types of medical insurance, individuals choose the coverage that is best for them. However, in many cases the high cost of private insurance priced people out of the market, and some went uninsured. One of the major reasons for this was that many people had pre-existing conditions that made it difficult for them to obtain insurance at all. Over half of American adults have been diagnosed with at least one chronic condition such as diabetes or heart disease, and a quarter have two or more chronic conditions. In 2010, the passage of The Affordable Care Act, often referred to as 'Obamacare' helped close the coverage gap for those not previously insured, including those with these chronic pre-existing conditions. In addition, the COVID-19 pandemic may have led to an increase in enrollment of insurance, since people expected that they may have been infected and in need more healthcare services. The drop of the uninsured rate since 2010 also corresponds with an increase in non-group coverage and Medicaid/CHIP coverage. As a result of these changes, the number of uninsured nonelderly Americans fell from 48 million in 2010 to 30 million in the first half of 2020.

As a percentage of Gross Domestic Product, U.S. healthcare expenditures increased from 15.5% in 2000 to 18.3% in 2021. Overall, expenditures on healthcare in U.S. have been rising rapidly in recent years and increased even more dramatically during the COVID pandemic. Hospitals and health systems experienced dramatic increases in expenses as a result of the complexity of care for the rising number of patients suffering from COVID, as well as supply chain challenges and labor shortages during the pandemic. According to research, hospitals lost at least 54 million dollars in net income in 2021, with more than a third of hospitals expected to have negative operating margins through year's end. The negative effects brought by COVID will continue in the future, since nearly 10 million cancer screenings were missed during the pandemic, and the providers are seeing higher level acuity cancer among previously undiagnosed patients. In addition, the specialty drug market continues to grow, which increases costs for consumers and hospitals.

2.3. Standard and Poors (S&P) 500

Before we look at the Health Sector of the economy, we first investigate the stock market in general. The most common measure of the overall performance of the market is the Standard and Poors 500 (S&P 500). It measures the performance of the 500 largest companies listed on stock exchanges in the U.S. These 500 companies represent the largest and most liquid companies in the U.S., from technology and software companies to banks and manufacturers. To be included in the S&P 500, a company must be publicly traded and based in the United States. It also needs to meet certain requirements for liquidity and market capitalization, have a public float of at least 10% of its shares, and have positive earnings over the trailing four quarters. The weighting of each company in the index is calculated by taking the company's market cap and dividing it by the total market cap of the index. The S&P is a market-capitalization-weighted index, meaning that larger companies with higher market values have a greater impact on the index's value. This differs from an equal-weighted index, where each company has an equal influence. S&P 500 is important because it includes the wide market breadth of large-cap companies. The index can provide a broad view of the economic health of the U.S. because it covers so many companies in so many different sectors. Because of its depth and diversity, the S&P 500 is widely considered one of the best gauges of large U.S. stocks, and even the entire equities market.

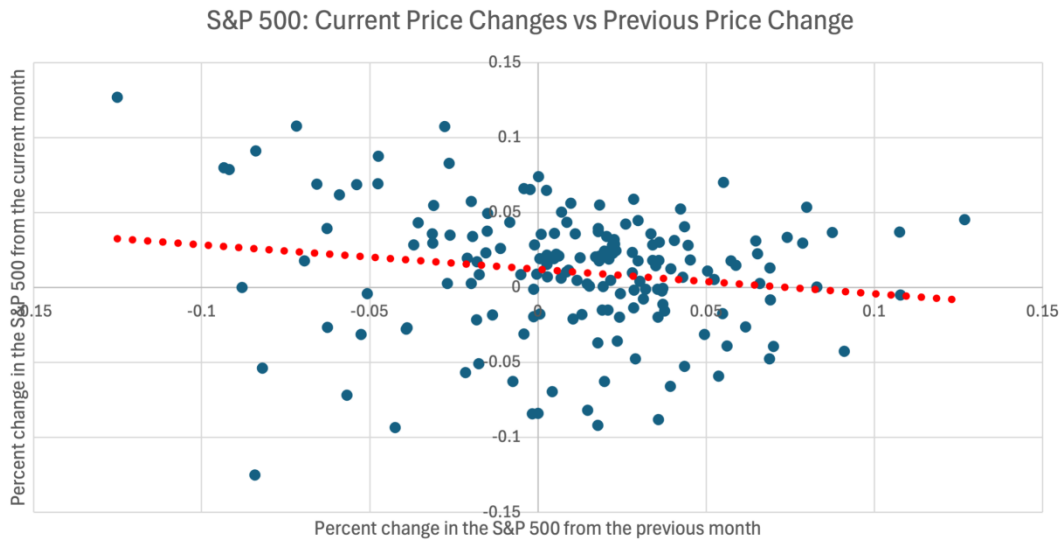


Figure 1. S&P 500: Current Price Changes vs Previous Price Change

Between the end of 2009 and the end of 2023, the S&P 500 grew by 438%, for an average increase of 11% per year over this period. Figure 1 shows the relationship between the percent change in the S&P 500 from the previous month and percent change in the S&P 500 from the current month over this period. The correlation between the previous month and the current month is -0.16 which implies a weak negative correlation between the percent change in the S&P 500 from the previous month and percent change from the current month. This means that if the index rises for one month, there is on average a slight decrease in the following period.

2.4. Health Care Industry

The focus of this study is to investigate the role that earnings and recent price changes have on current stock prices. To do so, we selected 19 companies from the industry, and looked at their monthly data from 2009 through the third quarter of 2023. These companies are listed in Appendix A and represent a range of services provided by the industry.

Figure 2 shows the relationship between Earnings per Share (EPS) and the price per share for our companies.

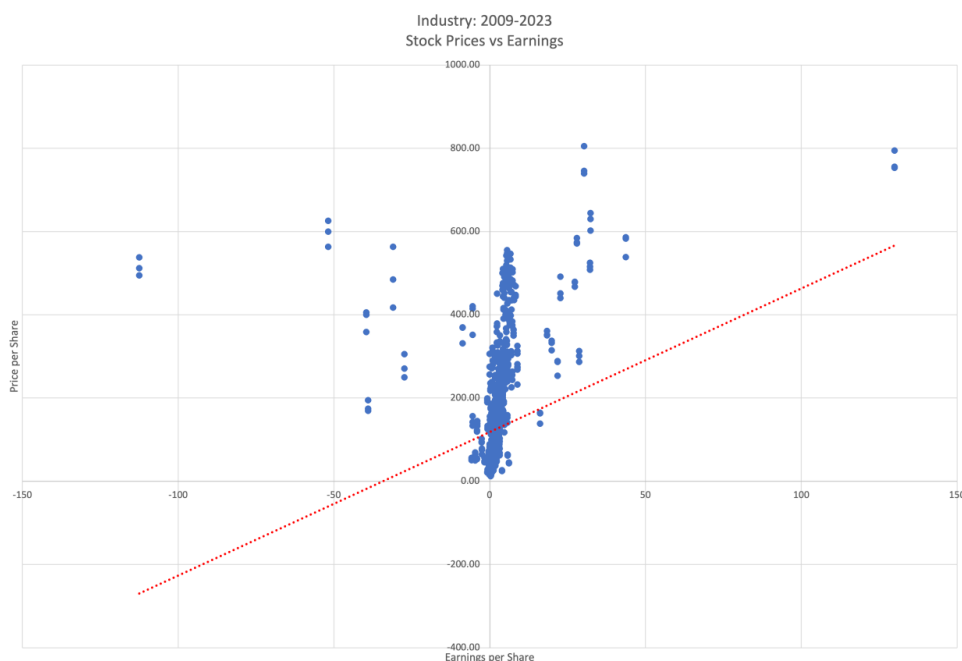


Figure 2. The relationship between Earnings per Share and the price per share

Overall, earnings per share and price per share from 2009 to 2023 had a correlation of .25, which means that when the earnings per share increase, prices per share also tend to increase. Most of the earnings per share ranges from -50 to 50. However, there are times when earnings per share get very large, up to 129.96, and times when earnings per share get very low, down to -112.5. However, even for firms with such large losses, the share price is still high.

We also look at the relationship between the share price from the previous month and the current month price change. This is illustrated in Figure 3.

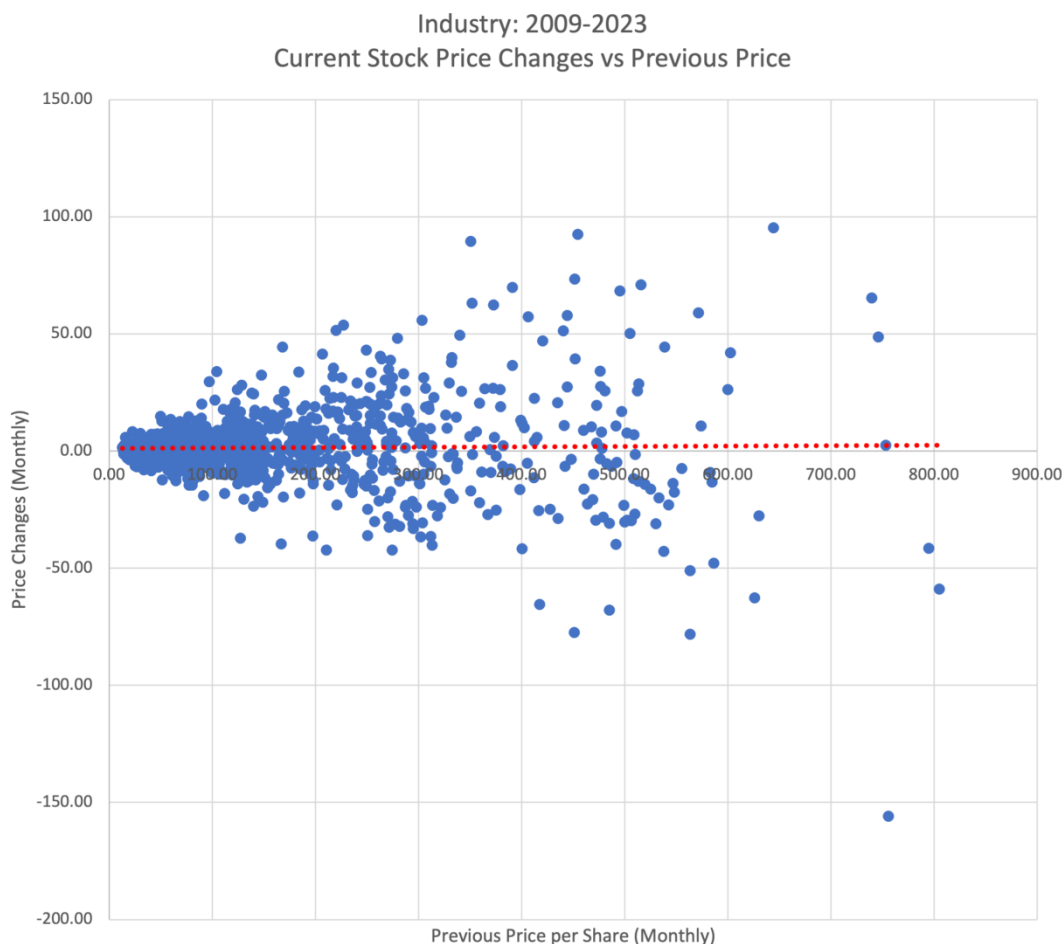


Figure 3. the relationship between the share price from the previous month and the current month price change

It is hard to say that there’s a strong relationship between previous price per share and current stock price changes. The points are gathered, the best-fit line shows a slope of approximately zero and the correlation between previous price and current month price change is .12.

2.5. Case Study

United Health group is the largest insurance company in the US, with a market valuation of 107.1 billion dollars. Their corporate offices are situated in Minnetonka, Minnesota. United Health offers health benefits and services to over 85 million people in all 50 states. It offers its services and advantages in over 125 nations worldwide. In 2014, United Health Group brought in approximately 130.5 billion dollars of revenue. In the 2014 Fortune 500 rankings, it came in at number 14.

The organization has shifted its emphasis over time to include individual and employer-sponsored health plans. It offers convenient payment methods for customers. The first diabetes health plan of this kind was unveiled by United Health group in 2009. Additionally, the business unveiled a novel cancer treatment payment plan in 2010 to compensate oncologists.

Whether it was supplying doctors with benchmarking tools, enhancing customer service, or informing clients about their health advantages, United Health Group continuously set itself apart

from its competitors by utilizing digital solutions with efficiency. This aided the business in drawing in new enrollments. It also assisted the business in managing its spending.

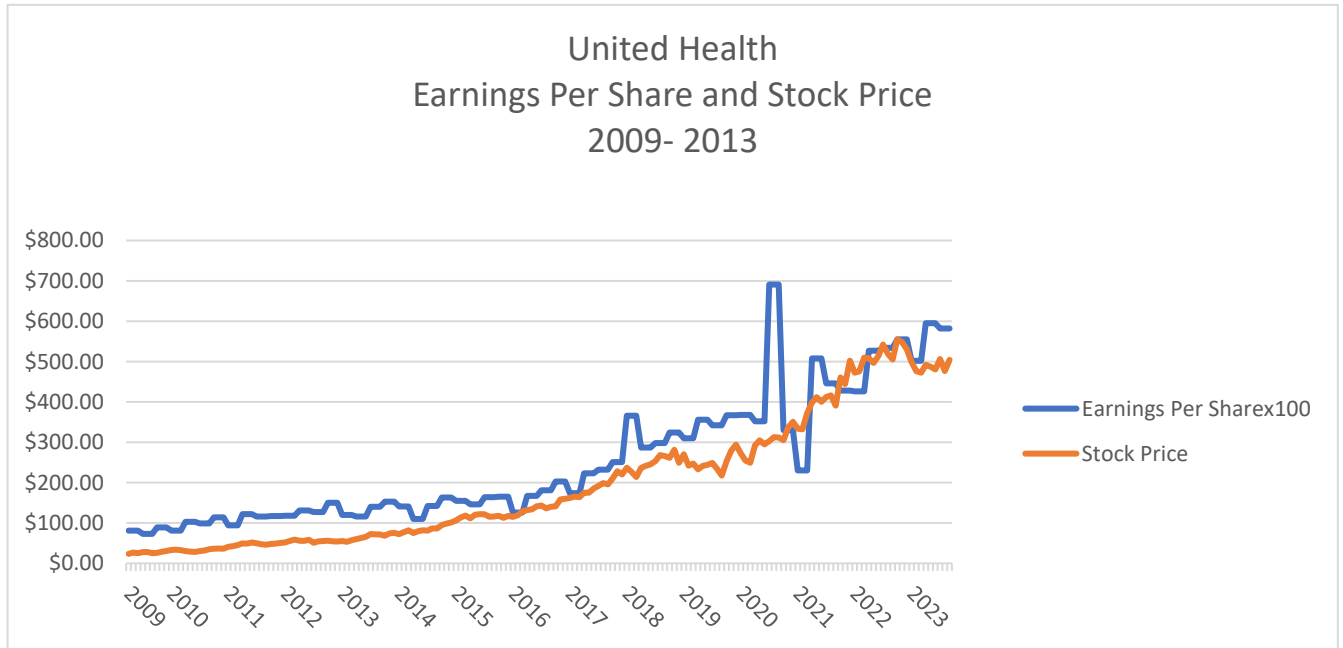


Figure 4. The value growth of United stock

As we can see in Figure 4, the value of United stock grew from \$23.52 in 2009 to \$504.19 in 2023, an average of 24% per year over this period. This is over twice the rate of 10.7% per year of the overall stock market (S&P 500). Over this period, earnings grew from \$.81 per share in 2009 to \$5.82 in 2023, an annual rate of about 15% per year. The correlation between earnings and stock price was .93, indicating a strong relationship between earnings and share prices. Finally, the correlation between changes in the current stock price with changes from the previous month was -.23, which means that investors may be anticipating that changes from month to month might be temporary.

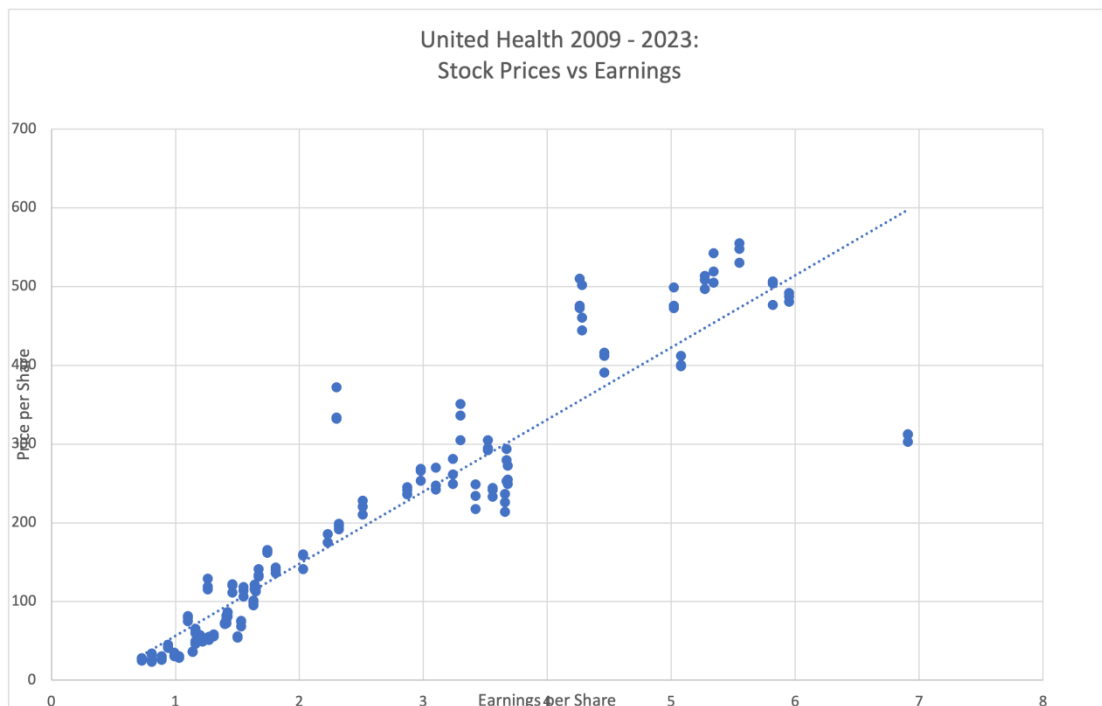


Figure 5. The relationship between stock prices and earnings of United Health

Figure 5 shows the relationship between stock prices and earnings of United Health from 2009 to 2023. As we can see in the plot, stock price and earnings from 2009 to 2023 are strongly positively correlated, that is, when the earnings per share increase, price per share also increase. However, this does not mean necessarily that the increase in earnings per share is causing the increase in price per share. It is possible that this is due to something called ‘spurious correlation’, where both variables are growing over time, but these changes are independent and not causal.

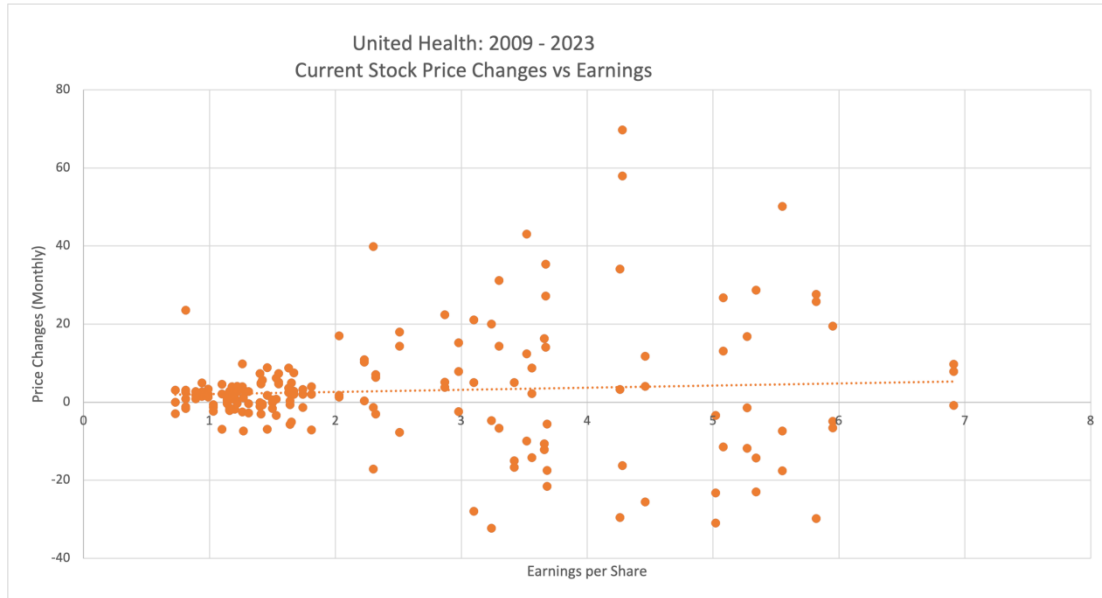


Figure 6. The changes in current stock price and earnings

In Figure 6, we can see that changes in current stock price and earnings are positively correlated, but the correlation is much weaker. The slope of the best-fit line is close to zero. The points are distributed close to each other at first, but then it’s scattered, not close to each other. In this case, when the earnings per share increase, the current stock price changes do not increase much.

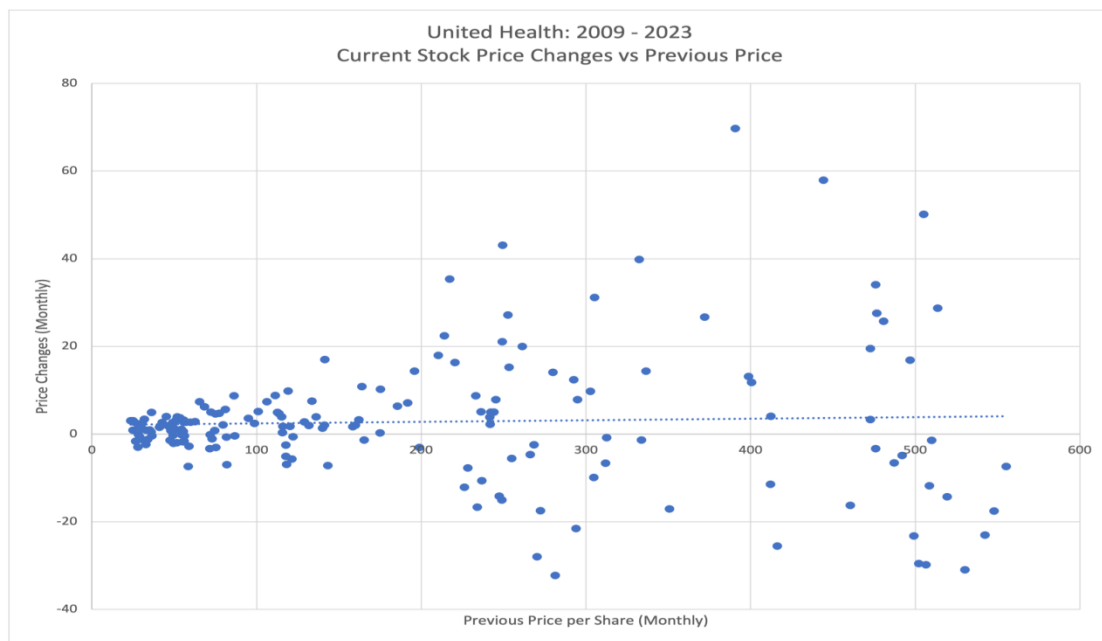


Figure 7. The relationship between changes in stock price and previous stock prices

In Figure the relationship between changes in stock price and previous stock prices are illustrated. As we can see in the graph, they are also positively correlated, but also that the relationship is much weaker. That is, when the previous price per share increases, the current stock price does not increase much. As such, the slope of the best fit line is close to zero.

2.6. Results

Data:

In this paper, we researched 19 medical firms in U.S. We used the monthly data of each firm from 2009 to 2023. The source of the data come from Yahoo Historical Finance Data.

Model:

We used linear regression model in this paper. The dependent variable is the monthly percent change in the stock price. There are two independent variables. The first is the change in earnings per share, which is the percent change in the stock price from the previous month. The other is the percent change in the stock price. The equation of this is:

$\% \text{Change in the Stock Price} = B_0 + B_1 * \text{Change in EPS} + B_2 * \% \text{Change in the Stock Price from the Previous Month.}$

Results:

We found that earnings per share have a positive effect on the monthly percent change in the stock price. This positive effect is statistically significant, with an increase in earnings per share of one standard deviation (\$8.84 per share) causes a .5% monthly increase in share price which is a 6.2% yearly increase.

Changes in share price from the previous month have a negative effect on the current monthly percent change in the stock price that is also statistically significant. A 1% increase in the share price in one month causes a .07% decrease in share price in the following month, which is an .87% yearly decrease.

2.7. List of Healthcare Companies

United Health
Elevance Health
CVS Health
HCA Healthcare
McKesson
Baxter
Molina
Fresenius Medical Care Bio-Rad Laboratories
Henry Schein
Universal Health Services
Da Vita
Omega Healthcare
Tenet Healthcare
Chemed
Acadia
Healthcare Realty
Quidel Ortho
Masimo
Sotera Health

3. Conclusions

The purpose of this paper was to investigate whether there are ‘contagion’ effects in the share prices of stocks in the U.S. healthcare sector. We chose this sector because it is a large and growing part of the economy that has also seen rapid increases in cost.

Perhaps the most common measure of whether a stock is priced correctly is earnings. Almost all investors use some form of earnings per share to help gauge if a stock is under or overpriced. However, little formal attention has been given to how investors react to recent changes in the price

of a stock. If a ‘contagion’ does exist, then we would expect to see investors jump in and drive up the current price if there was a large increase in the previous period.

As expected, we found that earnings do have a positive effect on share prices. However, there is no evidence of contagion suggested in our data. To the contrary, there are small negative ‘corrections’ to price changes, that indicate investors are wary that large changes in one month might be an overshooting that is partially reversed in the following period.

References

- [1] https://finance.yahoo.com/quote/MSFT/history/?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2x1LmNvbS8&guce_referrer_sig=AQAAACnJHF9E5-J7ZztiLmFZWkG_2qTtxtjbKlhCl2GaL-INWhbMRTyAwQBJ_Y3iIU-GiysrnkvXc7NB7zzq5adANDAxS6OVnVn5J2_d-ZJ_o70jUuLHgpjZCfIzo0kuonv4JpFb2r_ysM1Hg4AjJS5vaPSnIfYOJ5jCRrk1ow7bwDihhttps://www.investopedia.com/terms/t/trailingpe.asp
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