

To What Extent Can Social Media Be Used to Identify Potential Investments?

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Abstract

Digital technology and social media is getting popular, and investors are using them to their full potential to benefit their returns. First, this paper is going to explain fundamental analysis and technical analysis, and the difference between them. Then momentum and social media sentiment. Lastly, this paper will prove that various methods of technology and social media can be used to aid an investor's investment decision.

Keywords

Fundamental Analysis, Technical Analysis, Social Media, Momentum Trading, Relative Strength Index, Market Sentiment, Media Sentiment Reasoning

1. Introduction

Investors use different methods of stock analysis to aid them in differentiating when making a buy decision. There are two main types of stock analysis, fundamental and technical analysis. When investors are deciding about investing in a company, they will often engage in fundamental or/and technical analysis to help them decide about the company's investment value. By doing fundamental or/and technical analysis, it increases the probability of purchasing shares of a profitable company and decreases the rate of purchasing shares of a bad company. Fundamental and technical analysis increases the probability of making a good investment. In the first part of the paper, I will compare and contrast fundamental and technical analysis.

In the second part of the paper, I will show the link between technical analysis and social media activity. According to Google, social media is defined as websites and applications that enable users to create and share content. Investor sen-

timents that arise from social media platforms play an important role in shaping the investor demand and therefore pricing in the stock market. These social media platforms have created a digitalized investing environment that provides investors with a more efficient way to access a variety of online information. Social media can influence investor decisions on purchasing shares of a company. A recent survey has shown, almost 80% of institutional investors use social media as part of their regular workflow, and approximately 30% of them said that information they gathered on social media has influenced an investment recommendation or decision (Dure, 2021).

2. Different Types of Analysis

2.1. Fundamental Analysis

Fundamental analysis is a method of analyzing a company's performance and financial factors to aid the investor's decision on investing in the company. Fundamental analysis uses revenues, earnings, future growth, profit margins, and other data to determine a company's underlying value and potential for future growth. These data are available in a company's financial statements. In addition, an analysis of the competitive landscape is often done, comparing debt and financial data. Given this, valuations can be performed, and the investor can compare the valuation based on the company's financial statements to the current market value of the stock.

A security analyst is a financial professional who studies various industries and companies, provides research and valuation reports, and makes buy, sell, and/or hold recommendations. Security analysts gather data from a number of sources, including financial statements made publicly available on databases online, financial publications, information-sharing with financial researchers, and social media. The evaluations run by a security analyst determine whether the investor puts out a buy, sell, or hold recommendation in the financial markets. Clients and third parties usually pay for access to these reports.

A SWOT analysis is a compilation of a company's strengths, weaknesses, opportunities and threats. The primary objective of a SWOT analysis is to help organizations; a SWOT analysis is used to discern recommendations and strategies, with a focus on leveraging strengths and opportunities to overcome weaknesses and threats. Financial resources, physical resources, human resources, access to nature resources, and the current processes (employee programs) are some commonly considered internal factors for SWOT analysis. Some common external factors for SWOT analysis are market trends, economic trends, funding (donations, sponsorships), demographics, relationships with suppliers and partners, political, environmental, and economic regulations. **Figure 1** shows what fundamental investors find when performing SWOT analysis.

2.2. Technical Analysis

Technical analysis is a method of using charts to identify trading signals and



Figure 1. SWOT analysis of a brewery setup (Berry, 2019).

price patterns. Technical analysts attempt to predict price movement. The two primary variables for technical analysis are time frames and the chart patterns analysts decide to use. Technical analysts believe that market prices are more likely to continue past trends than to move erratically. They also believe that history tends to repeat itself. Therefore, past trends can be used to help interpret future price movements. Technical indicators are mathematical calculations that point to trade entry and exit signals. Trade signals help investors decide whether to buy or to sell. A good technical analyst achieves success by using historical charts to predict the movement of prices in the future.

Trading chart patterns often form designs, which can help predetermine price action, such as stock breakouts and reversals. Recognizing chart patterns will help an investor gain a competitive advantage in the market, and using charts will increase the value of the investor's future technical analysis. There are different types of charts used by traders, depending on their trading goals. The three primary types are line charts, bar charts, and candlestick charts. A line chart is a type of chart that displays information as a series of data points connected by straight line segments. Line charts are used to track changes over short and long periods of time. Line charts are simple and are often used by beginner analysts to help teach basic chart reading skills before learning more advanced

techniques, such as reading bar charts and candlestick charts. A bar chart uses rectangular blocks to represent data, each block typically shows open, high, low, and closing prices. Long vertical bars show there was a big price difference between the high and low of the period. That means volatility increased during that period. Volatility is a measure of risks; when a bar has very small vertical bars, it means there is little volatility, and when a bar has very big vertical bars, it means there is large volatility. Candlestick charts are used by traders to determine possible price movement based on past patterns. Candlesticks can visually represent the size of price moves with different colors. Bar charts and candlestick charts show the same information, just in a different way. Candlestick charts are more visual, due to the color coding of the price bars and thicker real bodies. Real bodies highlight the difference between the open and the close. These two candles together are patterns that suggest the future of the stock prices; they are indications. When a previous low or high is broken on the chart, some will see it as the sign of a new trend. But a lot of the time this does not happen.

Head and Shoulders:

A head and shoulders pattern is a chart formation that appears as a baseline with three peaks, where the outside two are close in height and the middle is highest. Head and shoulder trend is considered one of the most reliable trend reversal patterns; it is a chart formation that predicts a high to low trend reversal. As we can see from **Figure 2** below, there are two peaks to the left and right of the highest peak in the middle. This is an example of a head and shoulders pattern, which goes to a peak, drops down, goes to a higher peak, goes back down, and if the third peak is not higher than the second peak, it indicates the stock will go down. The short term indicator is that if the third peak is lower than the second peak it represents a head and shoulders.

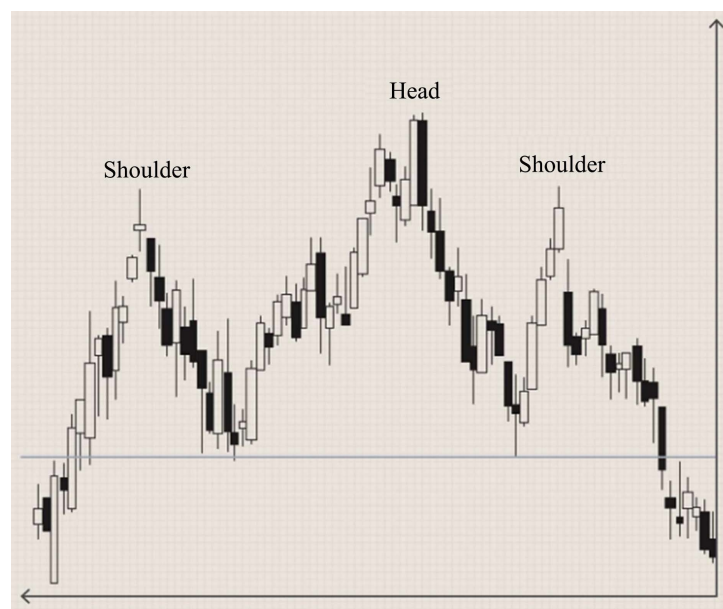


Figure 2. A head and shoulders pattern (Chen, 2022).

2.2.1. Double Bottom

A double bottom is a bullish reversal pattern that describes the fall, rebound, fall again, then a second rebound. A successful double bottom pattern looks like a W. The pattern typically marks the end of a downtrend and the beginning of an uptrend. A double bottom typically takes two to three months to form. As we can see in **Figure 3**, a double bottom is formed when the stock has a downward hill, upward recovery, down again, and upward hill again, forming a W. After the W, the stock will go up thanks to the double bottom indicator.

2.2.2. Cup and Handle

A cup and handle is a technical chart pattern that resembles a cup and handle where the cup is in the shape of a “u” and the handle has a slight downward drift. A cup and handle is considered a bullish signal or an upward signal (stock is going up) extending an uptrend, and it is used to spot opportunities to go long. The cup and handle pattern is one of the harder patterns to spot, and **Figure 4** is a good example of the cup and handle pattern. As we can see from **Figure 4**, the cup and handle pattern is formed when the chart drops down from a peak and continues in a bullish pattern slowly, until the chart forms a half circle, then suddenly goes into a bearish pattern.

2.2.3. Triple Top/Bottom

A triple top signals that the asset may no longer be rising, and that lower prices may be on the way. The opposite of a triple top is a triple bottom, which indicates the stock’s price is no longer falling and could head higher. **Figure 5** indicates a triple top signal, as we can see on the graph, the example stock hit three peaks, which indicates that the stock’s price might not increase in price any more but rather might fall.



Figure 3. Fox, 2020.

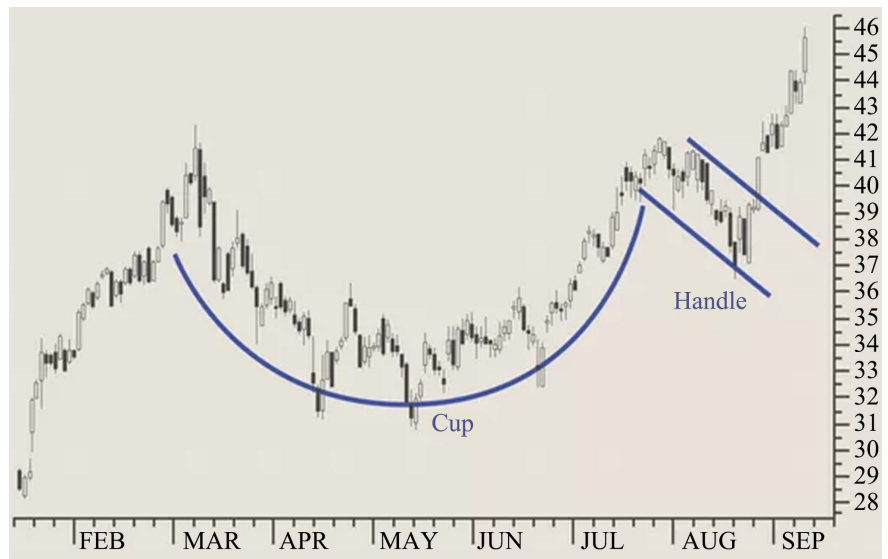


Figure 4. Hays, 2023.

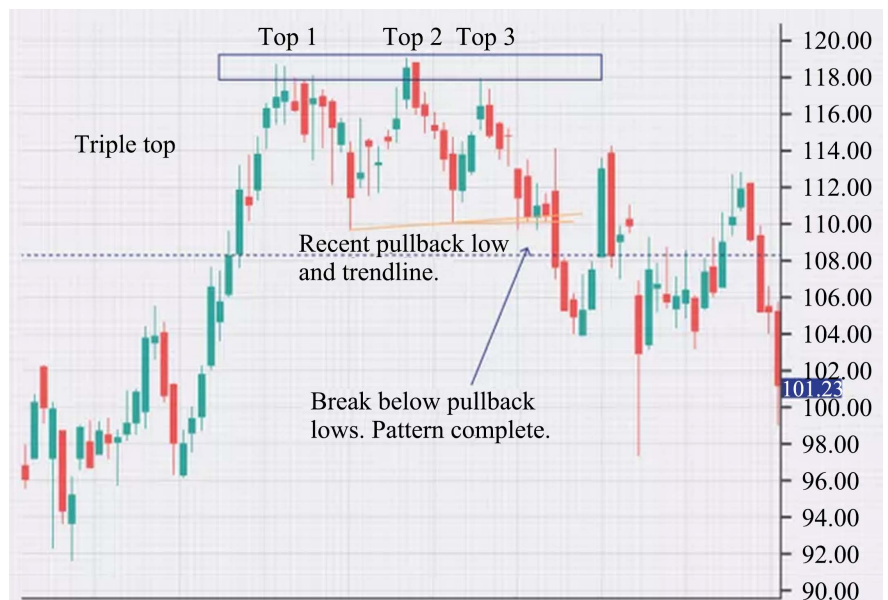


Figure 5. Mitchell, 2022.

2.3. Can Fundamental and Technical Analysis Identify Trading Opportunities?

American economist Eugene Fama, who received the Nobel Memorial Prize in economics in 2013, is considered the father of the overall theory of efficient-market hypothesis; efficient-market hypothesis is defined as a hypothesis in financial economics that states that stock prices reflect all available information. Fama said that “stocks always trade at their fair value, making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. As such, it should be impossible to outperform the overall market through expert stock selection or market timing, and that the only way an investor can pos-

sibly obtain higher returns is by chance or by purchasing riskier investments (Downey, 2022).” In simple terms, Eugene Fama said why should the market matter if everything is in strong form efficiency.

Strong-form efficiency has all the information in stocks, both public and private information. Therefore, no investor can gain advantage over the market as a whole. Semi-strong efficiency claims both that prices incorporate all publicly available information (information present in financial statements, etc.). It eliminates the use of fundamental or technical analysis for a higher return. Last but not least, weak form efficiency. Weak-form efficiency suggests that all past information is accounted for in the change of stock prices. Fundamental analysis of companies can provide the investor with information to produce returns above market averages in the short term. But no “patterns” exist. Therefore, technical analysis cannot be used to generate returns.

Fundamental analysis tells you very little about what might happen in the short term. Decisions on fundamental analysis have a high probability of being correct for long-term investment. Technical analysis can analyze stocks quickly, it is used for short-term investing. The impact of technical analysis on trading is often less than 60% (Lehner Investments, 2021). In order to use technical analysis profitably it requires a large number of trades. Technical analysis is more useful for short-term trading and market timing; market timing is when investors sell at the top and buy at the bottom. Determining the trend strength by using various technical indicators and then looking at the fundamentals to see if a future potential event could move the price is an excellent way of using both technical and fundamental analysis. Both can also be combined to plan and execute investments over short and long periods of investing.

3. Trading Strategies Stock Traders Use

3.1. Momentum

Momentum trading is the speed at which the stock price is changing. Momentum trading does not follow “buy low, sell high”; rather, momentum trading follows a strategy of “buy high, sell higher”. Momentum trading can be influenced by tangible events or catalysts (such as earnings reports, analyst or expert upgrades, etc.) Momentum trading can refer to either long-term or short-term types of stock trading (Barone, 2021). For example, the meme stocks (Gamestop, AMC, etc.) is considered short-term momentum trading; meme stocks are defined as the shares of a company that have gained a massive following online through social media platforms. Tesla (TSLA) is a good example of a long-term momentum trading stock. Investors of Tesla are constantly pushing the stock to go higher and higher.

Momentum investors often get their momentum trading ideas by watching for stocks that dramatically increase during earnings season. Momentum traders also get momentum trading ideas by following news feeds and wait for a sharp

increase from a stock. Momentum trading is risky. Professor Damodaran, the corporate finance and valuation professor from Stern School of Business at New York University, further explains that, “Momentum stocks have an average beta almost twice that of the rest of the market... and are much more volatile (Frankel, 2022).” Momentum trading can be a good way to make money when things work out, but it can quickly result in big losses if things go the other way. As an individual investor, practicing momentum investing will most likely lead to overall portfolio losses. When the individual investor purchases a rising stock or sells a falling stock, the investor will be reacting to older news than the professionals at the head of the momentum investing funds. This means that the professionals will sell the stock and make profit and leave the investor holding on to the stock and lose profit.

3.2. Measuring Momentum

The momentum indicators are useful for spotting shifts in the buying or selling of stocks, mainly through price changes. The Relative Strength Index (RSI) is a popular momentum indicator. Relative Strength Index acts as a unit for price changes and shows the speed at which they change. According to a study done by Lai Cao Mai Phuong and Vu Cam Nhung in 2021 (Nhung & Phuong, 2021), measuring investor sentiment on a daily basis based on the closing price of Singapore’s STI (a market capitalisation weighted index that tracks the performance of the top 30 companies listed on SGX) index from January 1, 1974, to December 31, 1994, showed that RSI can give positive returns considering the establishment of signals from different threshold values. The indicator fluctuates back and forth between zero and 100. Any rising RSI value above 50 signals a positive, uptrend momentum; though, if the RSI hits 70 or above, it’s often an indication of overbought conditions. On the contrary, RSI readings that decrease below 50 show negative, downtrend momentum. If RSI readings are below 30, though, it is an indication of possible oversold conditions. It was shown that a trading strategy using a combination of RSI with a moving average resulted in an average gross profit of 7.2% per year. A moving average is a technical indicator that market analysts and investors may use to determine the direction of a trend. It is called a “moving” average because it is continually recalculated based on the latest price data.

3.2.1. Rate of Change

The rate of change indicator is another example of a popular momentum indicator. It measures the speed at which the stock price is changing within a defined time period. It calculates the percentage change between the most recent stock price and the price compared to the year/month the user sets it to. The data received from the calculation is then plotted on a trendline, which fluctuates above and below the zero line as the rate of change moves from positive to negative. A value greater than zero indicates an increase in upward momentum and a value

less than zero suggests an increase in downward pressure. However, this indicator can be misleading if it's used by itself (like all the other momentum indicators), it should be used in a combination with other momentum indicators. As we can see from **Figure 6**.

3.2.2. Simple Moving Average

The simple moving average is one of the most popular technical indicators to use across all financial markets. It aims to identify trends within price charts by smoothing out past price action, and can be used for both short-term and long-term trading strategies. The simple moving average shows the average price of a company over a certain period of time, and it helps to identify entry points for a momentum trader (**Figure 7**).

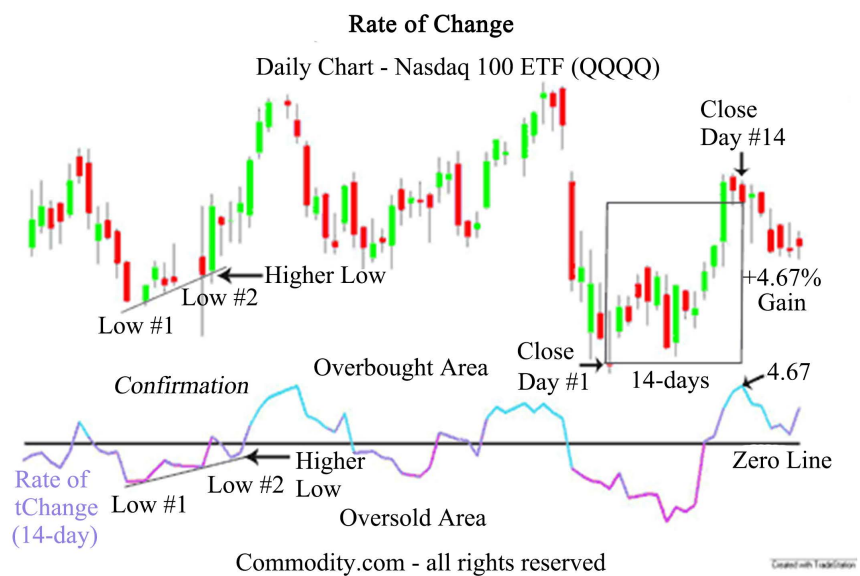


Figure 6. Pines, 2020.



Figure 7. Hayes, 2022.

3.2.3. Trading Volume

The trading volume measures the number of shares traded in a stock or contracts traded in futures or options. Volume of a stock can indicate market strength, rising stock prices on increasing volume are typically viewed as strong and healthy. When prices fall, increasing volume is typically viewed as weak and unhealthy. The volume oscillator shows the volume oscillator of a company, other momentum patterns can also be used with it (like the simple moving average momentum pattern). The volume oscillator makes it easy to see that volume momentum is increasing. If the volume oscillator is moving up, momentum is increasing. If the trading volume is moving down, it is indicating that the momentum is decreasing.

4. Market Sentiment

Market sentiment refers to the overall attitude of investors toward a particular stock. Sentiments of people are a strong factor that can change the trend of the entire market. Sentiment of stocks is a measure of a scaling system that reflects the people's emotions on how they feel about one company. It is usually measured in a scaled value, where a higher value means a positive sentiment and a negative value means a negative sentiment. It could be described as the aggregated public opinions, views, feelings, mood, or outlook that make up the market psychology at any point in time; as previously mentioned, if strong-form efficiency exists, market sentiment will not exist. Investors use market sentiment to find out which company to invest in, sentiment indicators are used to measure and earn profit from the short-term price movements in the market.

Refinitiv's research team did an experiment by using monthly aggregations of media sentiment data. They used the Refinitiv Market Psych Analytics (RMA) sentiment scores. RMA social sentiment scores represent aggregate scores from thousands of news and social media sites including Twitter, Reddit, and thousands of others (Peterson, 2021). The sentiment score is a time series of the net positive versus negative references to a given company. Every minute, business, financial news, and social media is scanned for new references to calculate the sentiment index score. For example, the sentence "Tesla is performing great" is scored as a positive sentiment value (+1) for Tesla (TSLA.O). After thousands of searches by using the sentiment index, a net sentiment score (positive vs negative balance) can be plotted over time, giving an overview of the media tone expressed about a specific company.

In the stock market, the analysis of market sentiment is valuable as it can determine the opinions of investors regarding certain stocks or assets. One of the most well-known is the VIX Index, which shows the market's expectations for volatility over the coming 30 days. Investors use the VIX to measure the level of risk, fear, or stress in the market when making investment decisions (Kuepper, 2023). When an idea is already widely agreed or known by the market, the impact will be limited. News events are often priced into the market long before

they occur, at which point much of the price action reverses as profits are taken. This is known as the “buy the rumor, sell the fact” trade. Only a substantial surprise can keep the momentum going—in most cases a move in the opposite direction will occur.

4.1. Use of Social Media

As previously mentioned, social media is defined as websites and applications that enable users to create and share content. Traditionally back in the 1940’s, investment clubs would see groups of people meet in person on a regular basis, discuss investment ideas and pool their money to invest in opportunities. According to a survey done by CNBC in 2020, social media is the top source for investment ideas among 18-to-35-year-old (Ragozino, 2021). The most significant example of this played out last year, with retail investors getting information and discussing trades on Twitter and Reddit and driving prices of “meme” stocks like GameStop to unpredicted highs.

Social media has a huge impact on investing, and social media is playing a big role in the market by changing the momentum of stocks. Social media platforms disseminate news and information about companies. This information can include announcements about earnings, new product launches, changes in management, and more. When this information is shared widely on social media, it can have a significant impact on investor sentiment and lead to changes in stock prices. Social media influencers, users that have a large amount of followers, could impact a stock’s price just by announcing it. One example of social media impacting investing is that Elon Musk was telling his 42 million Twitter followers to download an encrypted messaging app called Signal, but the tweet was mistaken as an endorsement of a small medical device firm, Signal Advance; which caused Musk’s followers to purchase the stock and driving the stock up 11,708% in just three days (Muldowney, 2021). Another known example of social media impacting investing is the GameStop stock. The WallStreetBets forum, which was a forum of influence, on the social media website, Reddit, encouraged retail investors to buy the video game company’s stock, causing its price to increase by 1500% in January.

Social media applications have their own privacy policies. When the user agrees to them, the user may be allowing the apps to view and use your data. Social media apps are able to take advantage of this data in ways the user may not find comfortable. It could be uncomfortable for the user because their information can be used for targeted ads, sold to marketers, or worse, sold into the black market (Loyola University of Maryland).

4.2. Social Media and Sentiment

People interacting on social media generate emotional data by expressing their emotions and opinions via tweets, forum posts, and blogs. They also consume it, and in the process are influenced by the sentiments, feelings, and opinions ex-

pressed by others. Scientific studies show that people are often influenced by the data they consume, and that their decisions or actions are partly aligned with it.

Investor sentiments play an important role in shaping the stock market. Analysts use social media to gather people's opinions on the company and use it to find out if it is a positive or negative sentiment. Social media data reveal significant public interest, almost in real time. As such, it serves as a convenient and appropriate source to measure market sentiments. Numerous professional and amateur analysts and investors use Twitter to post news articles and opinions, often more frequently than the mainstream news media.

Investors use social media and online traffic to determine the consumer's interaction with the brand. Social media can be used to find out how the company is answering their customer's questions, requests, and the speed they respond at. Another extension could be looked at by comparing the company to the company's competition, and how the reactive performance impacts their price swings.

Twitter tweets are used in investing by using VADER (Valence Aware Dictionary for Sentiment Reasoning) sentiment analyzer. VADER takes in a string and returns a dictionary of scores in each of four categories: negative, neural, positive and compound, which is computed by normalizing the scores of the first three. After applying VADER, the compound score is used to separate negative and positive tweets. If the dataset comes out mostly positive, it gives a side proof why the stock keeps on rising. However, there are downsides to this. The people who use Twitter to post opinions may never invest in the stock, and the people that invest in the stock might not use Twitter (Jones, 2020).

Data Sift illustrates how Facebook's stock price was affected by Twitter public sentiment and shows how the network can therefore directly influence share prices. The decrease in value just 25 minutes after the drop in sentiment demonstrates just how crucial Twitter is to judge stocks. As we can see from **Figure 8**, sentiment data creates a very close prediction with the actual stock price later. First sentiments turn negative ahead of opening, and 25 minutes later the stock starts to decline once the market is opened. Once the sentiment rebounds, 8 minutes later the stock rebounds. The blue circle represents Twitter sentiment, positive or negative. The red circle represents the actual stock price after the Twitter sentiment. As we can see from the figure above, the blue circle is always ahead of the red, and the red always follows the blue. The blue circle, Twitter sentiment data, can predict the future of a stock's price. **Figure 8** shows how important sentiment investing is, how market sentiment can predict the future of the prices of stocks.

According to recent data collected by Carly Hill of Sprout Social, 75% of investors use social media to help them invest (Hill, 2022). However, a lot of experienced investors don't use this new way of investing, they believe this method is too risky, they would rather stay with technical analysis and fundamental analysis which has been proven to work over many years, not wanting to take a risk in the new era of investing, social media.

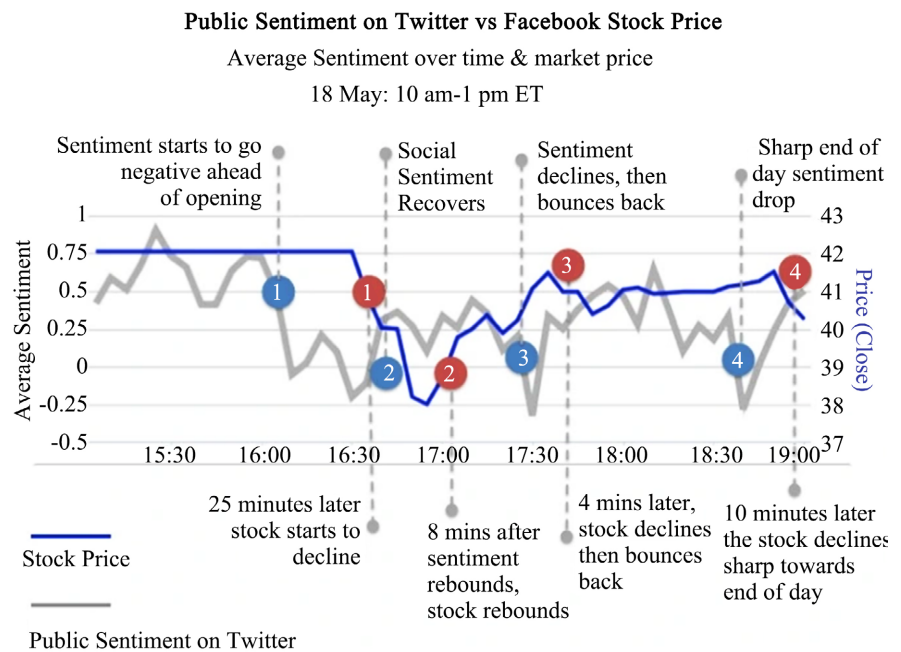


Figure 8. Lardinois, 2012.

5. Conclusion

Analysts use fundamental analysis to find the numbers/performance of the company. It is a great way to start off the investment by gaining some information about the company. Some simple ways of fundamental analysis is reading the balance sheet and the income statement.

There is evidence out there suggesting that social media can be used to aid their investing process. Investors use fundamental and technical analysis to aid their decisions in investing in companies. They also use methods like momentum, media sentiment scores, VADER, and other sentiment measures to prove that social media is used to identify investment opportunities in a positive way. As of January 2020, the global social media usage rate stood at 49 percent (Dixon, 2023). Social media is growing at a fast rate, more and more people are using social media over time. If this trend continues we can predict that in the future making decisions for investing would be heavily dependent on social media.

I found that social media is often used in the technical analysis route, and social media and media sentiment have an enormous impact on a stock's performance. Eugene Fama believes that stock prices reflect all available information, and all the other momentum indicators support his claim. Therefore every single piece of information which includes news, fundamental analysis, technical analysis, momentum, social media, etc., will all affect a stock's price. However, there are limitations to this research, as social media is relatively new, there are not any long term studies about social media and investing. Furthermore, the method of obtaining data is all online, which excludes the people without internet access.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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