

WORKING PAPER

Investment Opportunities and Strategies in an Era of Coronavirus Pandemic

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The COVID-19 continues to hit the world economy as well as the financial markets. As a result of the coronavirus spread across all continents, majority of the investors face their portfolios painted in a red ink, even though there are still opportunities to gain from the current pandemic situation. The traditional investment strategies have been well studied and well documented during economic booming. However, few research aimed on determining investment strategies during the pandemic times. This paper is aimed to provide a thorough study on the factors affecting the stock prices, and to discuss unique investment strategies with appropriate risk management through the pandemic era. In this paper, an industry sector analysis is conducted, and factors affecting the stock market are analyzed by using alternative data sets as an additional source of tracking a behavioral finance and developed a seven-step strategy. The results indicate that there are several industrial sectors that gained during the pandemic and could keep this pace in the nearest future and using the seven-step strategy could help in creating a full picture of the stocks performance on the market.

KEYWORDS:

investment opportunities, investment strategies, COVID-19, Coronavirus outbreak, pandemic, factors, stock market, stock price, evolutionary, revolutionary, financial valuation, financial statement, e-commerce industry, behavioral finance, alternative data

1 | INTRODUCTION

COVID-19 is a disease that only appeared in the public's alertness within the last three months but has created horrific damage to the world market. It has already sickened almost million people and killed several thousand people and enforced closing schools, factories, and disrupted supply chain, as a result, everything stopped working, also all countries shut-down their borders and traveling without any purpose is prohibited. The world dealing with the virus which is growing stronger day by day.

There is a huge economic loss for thousands of businesses because governments ordered to shut down businesses as a result people staying at home to stop spreading the pandemic. Many companies have financial risks and their value getting down, the most vulnerable companies during the crisis are weak companies which just entering the market and also heavily indebted businesses which have obligations. Even though there is a downturn in the market, there is a place to flourish which means that you can make a profit if you have a good strategy. By analyzing the market, we advise that it is a good time to consider different factors and strategies to invest in the stock market which we discuss in our article.

According to the article "3 Stocks That Will Benefit from the Coronavirus Pandemic", Yang (2020) says that there are three companies which are thriving in the market, he suggests invest to them: firstly, Kimberly-Clark (NYSE:KMB) the brand provides

personal care, tissue with range of Leenex, Wypall, and Scott. Due to the pandemic, people buying essential needs to home, for that reason demand for their stock increased. He says that the company's share price has held up well compare with other industries; secondly, there is a colossal demand to Zoom Video Communications (NASDAQ:ZM) which provides remote-conferencing service. The company supports a cloud-based platform for video and audio meetings. The service was launched to establish work remotely for some corporations, during the pandemic Zoom got popular. The stock price of Zoom dramatically increased compare with the market. The author also says that investors should invest in Zoom because after the pandemic stops most of the companies can decide to prolong their subscriptions on it; the third company is Clorox (NYSE:CLX) a well-known manufacturer and retailer of consumer products such as bleach and other cleaning supplies. Since the demand is rising for cleanups and disinfected products, the stock prices are growing. The main point of the article is that you can make money even the market is experiencing a downturn. By analyzing the article, we can suggest that the stock prices of three companies grew up, it would be a good investment at the beginning of January, but now stock prices are high, which could be overvalued in the market. From our assumption, we can say that these stocks are profitable in the short term, however, we should be careful in case we are going to invest in the long term prospective.

A pandemic always introduces uncertainties to an economy and is usually followed by V-shaped recoveries in economic activities. However, in different situations, the depth and the width of the "V" are highly uncertain. "The outbreak of coronavirus could be more disruptive because it is more severe and because of greater reliance on global supply chains", as an investment strategist at BlackRock mentioned recently. As a study approach we observed an investment opportunity in several industries during the pandemic, considering both short-term and long-term investment returns, pointing out a possible long-term growth of are revolutionary rather than evolutionary business models.

Nowadays, coronavirus created huge volatility in the global stock market leading to a declining trend in overall stock market positions. Demand for most of the goods is expected to decline except for necessities. Industries such as leisure tourism, supply chain, and transportation services will be in recession. So many airline companies, restaurant chains will lose their revenue. Moreover, since the coronavirus outbreak happened in China, the country with the highest production facilities operating and producing goods and services for the rest of the world, we could expect to face a recession in the manufacturing industry as well.

The stock market is very sensitive to people's expectations. Since coronavirus is a pandemic outbreak that led to high panic and people react negatively expecting the worst-case scenarios. Moreover, as Murphy's Law shows us expecting the general declining trend of price shares leads to an actual price drop in the stock market. Refer to the Yahoo finance article Global financial markets are overreacting for coronavirus outbreak. Approximately trillions of dollars of value have been destroyed in recent months. SP 500 had decreased over 13 percent by Friday 28. The index had lost all gain which brought stocks back where it was in October 2019. Moreover, the market did not react much until February 21 when it was identified that it is not easy to deal with coronavirus. How scientists say that a new disease is not a little thing since it can stop customers' spending and demands to products, shut down factories, bother supply chain and damage sentiment. On the other hand, the market reacts for each bad news by decreasing major indexes.

Investment Focus: We are going to analyze industries which are doing great in an era of Coronavirus outbreak:

1. Online entertainment (movies, games): Netflix, HBO, Gaming platforms;
2. Online education or online job market (Zoom/Skype/Dingding/ATT/Verizon);
3. Food Industry;
4. Healthcare.

2 | ONLINE SERVICES

2.1 | Online entertainment

Recent global coronavirus outbreak made millions of people prisoned at their houses. This resulted in the popularization of in-home entertainment services. So, companies such as Netflix, HBO, Amazon Prime Video and Youtube broadcasting channels are beneficial and playing on the other side of the global crisis court. Firstly, Netflix (Appendix 1.1.) has really benefited from the pandemic outbreak since it is the easiest way to entertain home-stay people. This can be backed up by the stock price performance. We analyzed the historical prices for NFLX for the last two months (to be exact since January, 10th, 2020 - the day when the coronavirus was announced). If we look at the prices we could see a general upward trend starting from January,

10, 2020 that is a demonstration support showing the correct flow of logic that home-stay entertainment is doing well in global crisis times. So, if coronavirus continues to spread among the population of other big countries, as well as United States, and more and more people will be on quarantine at their homes, Netflix and other representatives of online entertainment industries will be in benefits even more. So, we could forecast a price increase in the nearest future. The second thing which is analyzed is that we consider Netflix as an evolutionary business unit, since it is not something absolutely new, because TV broadcasting has been already developed when Netflix entered this market. Also, looking at the cost structure in the business model, about 62 percent related to costs of revenue, which is, actually, considered as not a desirable proportion for the future investment decision making. So, in this case it won't be something attractive for the investor in the long-term, however, in the short-term during the coronavirus outbreak it could be a reasonable investment with high return.

2.1.1 | Video Gaming

The second home-stay entertainment that is very popular among young people staying at home is video games. According to the recent barrons' statistics the number of users of the game named "Honors of King" surpassed 100 million people at the Lunar New Year in China. This is in comparison to the average 60 million users per day. And this trend is more likely to continue since coronavirus prisoned millions of people at home, especially college and university students - the target audience of video game industry. So, Tencent Holdings and NetEase - companies that are in video game business showed the highest positive fluctuations during the last period among Chinese stocks. According to barrons' Tencent traded 26 times 2020 expected earnings and NetEase at 18 times. So, this kind of intuitive thinking and flow of logics lead us to forecast a further growth in their earnings. Since, the video games is basically a software which is not requires high inventory and COGS part of the business model structure it is a good sign to invest in the short-term, as well as in the long-term perspective.

2.2 | Online Education

Affected by the coronavirus epidemic, in order to ensure the safety of students and campuses, many Universities and middle schools in China and around the world chose to conduct the courses online. Some of the schools are trying to launch their own online education system, but others choose to use online conference platforms such as RTX Meeting by Tencent, and Zoom, Skype, which is a major usage of such platforms and has boosted their stock price recently to some extent.

Such trends are regarded by some experts as not just an expedient solution or an alternative to physical education but a long-run improvement and upgrade of online education infrastructure and technology. Therefore, such transformation from offline education to online education might become a revolution but not only an evolution in education sectors. Such revolution might bring potential considerable profits to some technology companies running online education platform not only under the pandemic, but also in a long-run horizon. Such companies including Appendix (1.2.) Tencent, Skype, Zoom, Iflytek, China Hi-tech, Quantong Education, Only Education, Vision Source, Sanaifu. The other popular educational platform that has a growing popularity is Coursera. Many top universities already uploaded their study materials there. In times of total quarantine situation all universities now are moving to online education and most of them are choosing exactly coursera web platform. Online education can also be extra-curriculum, under user's own choices, which bring opportunities to some third-party online MOOC courses companies, such as Coursera, Udacity, Udemy, edX, Lynda, Open Culture, Envato Tuts, Alison, Open Learn, Future Learn. However, some platforms cannot be used in China due to the firewall. So other local online courses provider such as Xindongfang (EDU) and NetEase OpenCourse are more popular in China. Appendix 1.3.

2.2.1 | A good investment target: GSX Techedu

GSX Techedu operates an online live streaming platform where teachers can teach through the platform and each class can accommodate up to 100,000 people. The company itself hires qualified teachers instead of relying on part-time teachers. And the company said that only 2 percent of the teachers who can be hired can stay in the classroom. In addition, GSX also develops its own internal courses instead of relying on third-party materials. Stock price of Chinese online live streaming education company GSX Techedu have recently increased sharply. Its fourth quarter financial report showed that GSX Techedu's revenue increased by 413 percent year-on-year to 935 million yuan (133 million US dollars), which was 12 million US dollars higher than market expectations. In terms of profit, net income increased by 657 percent to 174.5 million yuan (US dollars 25 million). Under non-GAAP conditions, net income increased by 617 percent to RMB 197.8 million (US dollars 28 million), and the revenue per ADS was US dollars 0.10, which exceeded market expectations. For the whole of last year, GSX Techedu's revenue increased

by 432 percent and non-GAAP net income increased by 1021 percent. (Source: Financial World Website). These high-speed growth data explain why GSX Tchedu's stock can soar by more than 300 percent after listing in June last year, even under many negative factors such as Sino-US trade friction, tariffs, slowing Chinese economic growth and the outbreak of the coronavirus.

In the last quarter, the total number of GSX applicants increased by 290 percent year-on-year to 1.12 million, and the non-GAAP gross profit margin increased from 68.3 percent to 79.7 percent. Since December 2019, the stock price of GSX showed an obvious sharp increase which might be due to the outbreak of coronavirus. In the long term, there is still more room for GSX Tchedu to rise in the future. Now GSX Tchedu's price-earnings ratio is only 8 times, and the market trend might be implying that this stock might be still undervalued. GSX Tchedu might be a good investment opportunity for investors who is interested in online education industry (See Appendix 1.4).

2.2.2 | Zoom Video Communications Inc.

Zoom Video Communications Inc.'s shares are steadily growing in the last two months. Zoom offers online services such as video meetings, voice webinars, and chat across your desktop. The stock increased by 47 percent in the last month, when companies encouraged employees to work from homes. If the global situation will not change, the more companies start to use this platform. For instance, JPMorgan said that it is too early to predict Zoom Inc.'s success because, most of the companies connecting through a free app, and it is unclear whether they can be switch paying ones. The stock has scored the biggest increase from the disease; however, the company was performing very poorly before the coronavirus outbreak. If we look the article from a stock watch is says that Zoom shows net income 15.3 million, or 5 cents a share, for the quarter, compared with net income of 1.2 million, or 1 cent a share, in the year-ago fourth quarter. Adjusted per-share earnings came to 15 cents. If we analyze the data: Revenue grew to 188.3 dollars million from 105.8 which is a 78 percent percent increase, which is more than analytics were predicting. Zoom Inc. company is evolutionary since the market has other companies with the same feature such as skype, where you can meet online. The stock rose more than 8 percent in early trading on March 5. Furthermore, coronavirus can change the whole industry job industry, because, employees find easy to connect with workers by the online platform. If the market changes due to disease, then Zoom Inc. stocks get much higher. Also, online platforms had almost zero cost of goods and some administrative expenses, which cannot be so high, for that reason, we think that it is a good short-term investment for the coming 3 months. If we consider as a long-term investment, it can be profitable too, since the organizational structure of companies changing day by day. It is not expensive for employees to provide an online meeting platform for workers, also, it can cut some expenses of companies. They can connect with people online, then meeting with them in real life.

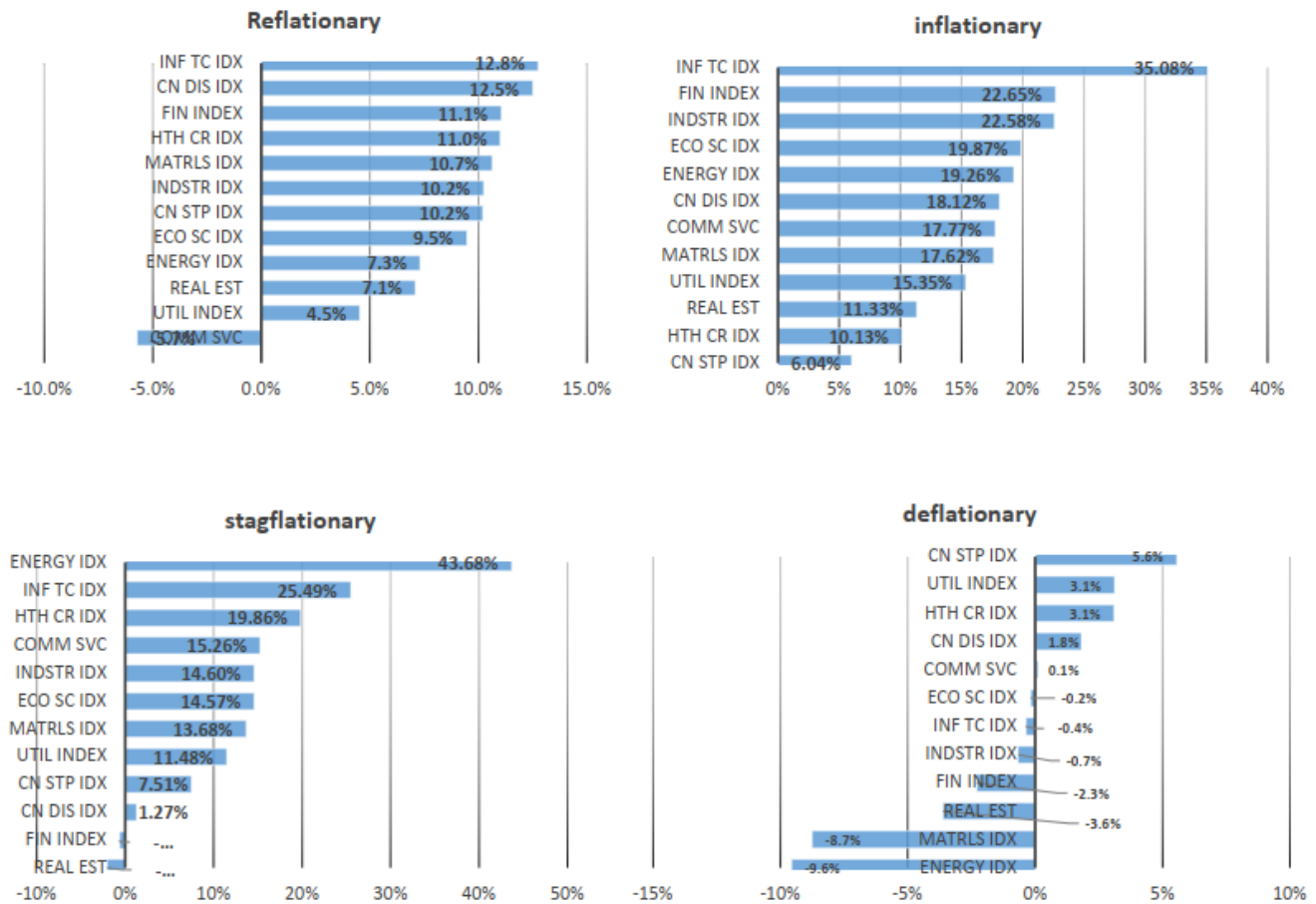
3 | DEFENSIVE BUSINESS

With the coronavirus outbreak spreading rapidly in countries beyond China, the impacts on economics also were felt outside of China as well. From the recent market data, we suppose that the economic will stay in the deflationary phase for a few months. Firstly, we get the quarterly ISM index and its moving average from 1995 to 2019. If the moving average for ISM this quarter is larger than the moving average for ISM last quarter, then we define the growth up; meanwhile, if the moving average for ISM this quarter is smaller than the moving average for ISM last period, we suppose the growth down. As for the CPI part, we also use moving average to determine the inflation up or down. If the moving average for CPI this period is larger than the moving average for CPI this period is larger than the moving average for CPI last quarter, then there is inflation up. Otherwise, we suppose that the inflation is down. The table below shows our definition about the four phases.

Stage	Reflationary	Inflationary	Stagflationary	Deflationary
Moving Average of ISM (Growth)	Up	Up	Down	Down
Moving Average of CPI (Inflation)	Down	Up	Up	Down

After defining cycles, we collected quarterly returns for GICS Level1 industries. We compared 11 different industries' performances in the reflationary, inflationary, stagflationary and deflationary stages. Based on their geographic mean, percentage of having positive returns and percentage of outperform the benchmark, we picked healthcare industry and consumer staples

industry (focus on food)



The Geomean of SP1500 Sectors from 1995 to 2019



Percentage of Having Positive Geomean Returns

% beat benchmark	reflationary	inflationary	stagflationary	deflationary
S&P SPCM 1500 UTIL INDEX	30.77%	44.44%	30.77%	58.82%
S&P SPCM 1500 Real Est	30.77%	22.22%	30.77%	52.94%
S&P SPCM 1500 MATRLS IDX	46.15%	55.56%	46.15%	35.29%
S&P SPCM 1500 INF TC IDX	53.85%	77.78%	84.62%	64.71%
S&P SPCM 1500 INDSTR IDX	46.15%	77.78%	46.15%	35.29%
S&P SPCM 1500 HTH CR IDX	61.54%	33.33%	69.23%	58.82%
S&P SPCM 1500 FIN INDEX	53.85%	66.67%	23.08%	41.18%
S&P SPCM 1500 ENERGY IDX	53.85%	55.56%	69.23%	29.41%
S&P SPCM 1500 COMM SVC	23.08%	55.56%	46.15%	58.82%
S&P SPCM 1500 CN STP IDX	46.15%	11.11%	23.08%	52.94%
S&P SPCM 1500 CN DIS IDX	76.92%	44.44%	23.08%	64.71%

Percentage of Beating Benchmark Returns

3.1 | Healthcare Industry

If a patchwork of local epidemics coalesces into a pandemic in the coming weeks, health-care companies will be on the front line: treating the ill, paying for care, and seeking cures. Here's how coronavirus could affect several key segments of the health-care industry.

3.1.1 | Basic-need companies

Basic-need companies typically have solid pricing power in any economic environment, and their cash flow is usually highly predictable, given the consistent demand for their products, especially during the special time. Johnson Johnson always have a steady stream of demand for its medical devices and high-margin pharmaceutical products, because we don't get the luxury when we get sick or what ailments we develop. Moreover, Johnson Johnson is also one of just two publicly traded companies with a higher credit rating (AAA) than the US government(AA). Therefore, during this special time, Johnson Johnson is worth to be invested.

3.1.2 | Biotech

Gilead Sciences(GILD) and Moderna (MRNA), two companies that have drawn significant attention for their progress on a treatment and a vaccine for the coronavirus in the past few weeks. Their stock price significantly rise up. Appendix 2.3.

3.1.3 | Medical Technology

COVID-19 brings huge demand for online medical services. Ping An Healthcare and Technology Limited (SEHK:1833), also known as Ping An Good Doctor, is a leading Chinese medical technology company that provides online medical services, consumer healthcare services, and runs an online health mall for drugs, medical devices, and other nutrition products. The most attractive part of the business is the company's online health services, in which patients can get in touch with a professional doctor over the internet. The stock of Ping An Good Doctor has been on fire recently, up a whopping 31.4percent year to date in spite of the coronavirus. Appendix 3.1.

3.2 | Food Industry

3.2.1 | Changes in Chinese Fresh Food Industry

Under the control of the government, most citizens get fresh food through the distribution community. Or in more cases, citizens may purchase fresh food online. Therefore, coronavirus has brought opportunities to the fresh e-commerce industry. According to data from the Chinese E-Commerce Research Center, the profit of the fresh e-commerce industry is low since 2016. As of 2019, more than 4,000 fresh food e-commerce platforms in China are only profited by 1percent, and more than 88percent of fresh food e-commerce companies are facing losses. Coronavirus activated the fresh food e-commerce industry to some extent, though, the industry will face more stringent survival of the fittest after the epidemic is over.

3.2.2 | Post-popular Industry Structure May Shuffle

In the short term, due to the consumer's hoarding demand, the clearance of vegetable markets and small vendors, and the decrease in outbound catering consumption, the leading performance of high-quality supply chains will perform well. During this period, small-scale regional enterprises without scale and slightly insufficient supply chain support may experience actual pressures in capital turnover, supply chain, and store operations. Fresh platforms that can better meet consumer demand during special periods may benefit from better consumer reputation and brand recognition in the future. Appendix 2.1.

3.2.3 | Investment Advice in Fresh Food E-commerce

Investors are advised to prioritize the leading industries in fresh e-commerce, and at the same time follow the trend of the industrial chain to find investment opportunities. Due to the decrease in the number of people going out and the substitution of home consumption demand, the epidemic situation is expected to have little impact on the industries of quick-frozen foods, snack foods, health products, and convenience foods. However, the dairy and meat products sectors that are in strong demand will be greatly affected. Consider comprehensively the industrial chain situation of key industries, the trend of medium and long-term consumption upgrade, and the impact of short-term epidemic conditions. Key recommendations: Yonghui Superstores Co., Ltd. (601933.SS), JD.com, Inc. (JD), Meituan Dianping (3690.HK). Take Yonghui Supermarket as an example. Over this years, Yonghui Superstores' revenue and profits have maintained and even ahead of the industry. It is estimated that the net profit for 2020-2021 will be 2.833 / 3.681 billion yuan. The corresponding EPS is 0.30 / 0.38 yuan. The current stock price corresponds to PE at 24/20 times. As a leading industry with outstanding core competitiveness, Yonghui Superstore should be evaluated via a certain valuation premium.

4 | LONG-TERM INVESTMENT

The global COVID-19 pandemic is the most difficult time for each of the companies where managers should handle significant questions day by day. The executives try to meet and balance the needs of all key stakeholders – partners, suppliers, customers, and society in general. All decisions in which top management choose can affect the future growth of the company. Many investors can get scared by the current situation; however, we think that investing in a difficult time can be profitable on a long-term perspective. Many specialists have their own opinion related to COVID-19 investment, if some investors think that it is wise to invest in secure technology, some of them suggest taking a risk and contribute money to struggling industries because they will recover after the recession. According to the article “Warren Buffett calls coronavirus outbreak ‘scary stuff,’ but says he won’t be selling stocks” (Stempel,2020), Buffet says that investors with a 10- to 20-year time horizon and focused on companies' earnings power will fare well in stocks, and that the outbreak has “not changed” his long-term outlook. He mentioned that “There’s always trouble coming”, “The real question is where are those businesses going to be in five or 10 years.” Moreover, the article discusses how the virus disrupt supply chain and slow down global economy.

Furthermore, the second article from the Nasdaq portal is about “3 Stocks Warren Buffett Is Probably Buying During the Coronavirus Market Crash” (Speights, 2020) talks about which companies Buffett can prefer in the recent time. The first company is Apple (NASDAQ: AAPL). He stated in a recent interview that “it is probably the best business I know in the world.” In 2018, he told that he would love to own 100 percent of Apple. The stock is cheaper for 30 percent percent which is a lot cheaper. Also, we know that Buffet likes to buy the stock at a fair price. We know that Apple's stocks were overvalued, however, due to pandemic stock prices are low which makes favorable to invest in Apple stocks. Secondly, the banking industry has been one of Buffet's favorite investing stocks. One of the most appealing stocks is Bank of America (NYSE: BAC) which Berkshire

Hathaway currently owns shares of more than half a dozen bank stocks. The author says that Berkshire's stake wants to extend bank stocks as a result of the market crash. Due to the virus shares of Bank of America fall more than 40 percent off from their previous numbers. Bank of American stock is attractive because of dividends which Buffet considers as a characteristic of profitable investment. The price and dividends are positive factors, but he also mentioned that the last investment of the bank in new technology and growth shows that it is the right field to invest. The last company is which Buffet consider investing is Southwest Airlines (NYSE: LUV). Berkshire has three of the major airline's stocks, he announced that he is not going to sell airlines stocks, he would prefer buy some of them, especially Southwest Airline's stock price went down for 40percent, also they could be one of the companies which government of the US can finance to recover after the market crash.

The Wall Street Journal published the article by (Zweig, 2020) "This Is Your Brain on a Crashing Stock Market" mentions that a market crash is scary, but we should not get panic and should invest wisely because the market will recover after the downturn. Additionally, Nasdaq President and Chief Executive Officer Adena Friedman believes it is best to keep the markets open despite the coronavirus pandemic continued to stoke fear and unprecedented market volatility. New York post (Manskar, 2020) published that "It's a good time, for example, to get a discount on blue-chip companies like Microsoft, whose Teams workplace collaboration platform is getting plenty of use as more people work from home, according to Anthony Denier, CEO of the trading platform Webull." Furthermore, article suggests considering stocks such as Disney, Costco, Zoom. Whereas, Michael Brush (2020) in the article "Who's buying stocks? Executives at TripAdvisor, Newell Brands, and other companies are buying at low prices" says that "those in the know" are buying, and "those not in the know" are selling. The article says that is valuable to invest sectors that supposedly get hit hardest by the virus: air travel, amusement parks, restaurants and economically sensitive areas like basic materials, energy and industrial. They are cheap and profitable sectors in long term investment. Moreover, Berkshire Hathaway had 2020 annual shareholders meeting with a firm message at the beginning of May.

According to the article "5 Takeaways from the 2020 Berkshire Hathaway Annual Meeting" (Kolakowski, 2020), they think that after the COVID-19 it takes a long time to recover to the market, but Buffett remains highly optimistic about the U.S. economy, he says that "Nothing can stop America". Also, one of the major news was that Berkshire sold its remaining holdings of the stocks. Whereas, he keeps investing in 5 companies: Apple Inc, American Express, Bank of America Corporation, The Coca-Cola Company, Wells Fargo Co. Berkshire reported first-quarter results, which were negatively affected by the pandemic. Buffett says that "Anything Can Happen in Term of Markets", it is unknown what can happen next, he suggests do not invest borrowed money to the market because there is more risk rather than the good outcome.

We would like to advise 4 tips during a pandemic which can help stay calm and save your investment:

1. Avoid checking your portfolio. Checking a portfolio can cause anxiety and stress;
2. Avoid selling your investments only because of their cheap. Holding cheap stocks even during downturns has generally been an effective strategy;
3. Avoid panic selling or buying stocks on an impulse;
4. Review your financial goals, it is a good time to plan your future investments;

By summarizing, stock creates good gains in the long-term against many short-term downturns caused by the global occurrence, for that reason we would like to suggest keep your stocks and do new investments.

Investment Focus: We are going to analyze 5 companies which will give us gain in Long-term perspective an era of Coronavirus outbreak:

1. Microsoft
2. Amazon
3. Apple Inc
4. Facebook
5. Visa

It is hard to choose from many companies since there are thousands of stocks in the market, and it can be a huge challenge to choose from so many companies. For that reason, we can recommend considering Blue Chip stocks because they are well-known and rapidly growing companies in the market. Selecting process for that elite group can be warranted for treating them as blue-chip stocks.

4.1 | Microsoft

Microsoft is a software industry company; it is one of the leaders in the operating systems and productivity software. Microsoft played a significant role in driving the success of the entire tech industry, also as a hardware provider. Moreover, the company launched the Microsoft operating system which calls as a Windows platform – getting installed automatically on the majority of computers. In the last decades, Microsoft boosted revenue by acquisition on the LinkedIn business social networks, Surface mobile devices, Skype video communication, and other start-up companies. Microsoft is not only a leader in the software industry but also looking for new ideas to profit from technology. Since the company is concentrating on new technology and offers good service, we can invest in Microsoft.



4.2 | Amazon

Amazon is one of the biggest success stories of the internet era. From its modest beginning as an online bookseller, it expanded to become a giant e-commerce company with different business ventures. The company has different ventures such as an online marketplace with third-party sellers to use the platform for direct retail service of its own; online food industry, grocery service and delivery of the products; entertainment such as prime-video, music and games, e-book; also the company offers Amazon Web Service which contains cloud service for the business. Moreover, most of the company's revenue comes from Prime subscription which can guarantee free shipping for customers. Amazon has new opportunities to grow since most of the sales comes from the US, whereas the international sales make small portion which means that they can extend the business in future decades. The company also can invest in artificial intelligence, data analytics, blockchain, advertising system which can assist to grow in the future. Amazon is not a member of Dow Jones Industries, but the company fully deserves blue-chip status.

4.3 | Apple Inc.

Apple is one of the giants in the electronics and technology industry in recent history. The company offered user-friendly, business-oriented PCs, and introduced Mac computers in the 1990s. The most significant contribution was made in the mobile industry by offering Apple products, as well as iPod altered the way how people listen to music, podcasts, additionally, the company is one of the first who introduced Apple Watch, Air Pods. One of the risky moments to Apple was the death of co-founder Steve Jobs, however, the company found ways to grow by increasing the number of products and offering new online



services. In the latest years, investors were worried about the company's future, but the company is building out its service lineup, also enhancing iTunes, Apple Music, and working on its Apple TV+ service to go up against some of the giants of the video-streaming industry. Apple Inc. has returned most of the investors by displaying good performance in the market. Apple Inc. attracts customers by offering quality, hi-tech products which occasioned with wealth and luxury goods. We think that contributing to Apple Inc. is a secure investment since it has grown steadily and conveyed new opportunities in the tech industry.



4.4 | Facebook

Facebook is one of the most controversial companies which only exist for 15 years and become a blue-chip status company. The company is pioneering in the social media industry and started a new era in global internet space by accumulating the data of the entire planet among its user base. The company publicly traded back in 2012, immediately after the IPO, the Facebook stock declined since investors were not sure about the profitability of social media and the future growth of this industry. By the time, Facebook continued working on the service by adapting it on mobile devices. They made the most of the profit by advertising on the platform and gathering data from social media and selling. Facebook bought acquisitions such as Instagram application, which is strong following among the young generation, it has not able to generate huge amounts of revenue in the WhatsApp messenger platform and Oculus virtual reality business, but they are going to enhance listed segments and can generate money in the future. Moreover, Facebook presented the social media currency which calls libra, which can change the whole entire financial sector. Most investors think that social media is a risky investment, but we should know that Facebook is a leader in its field.



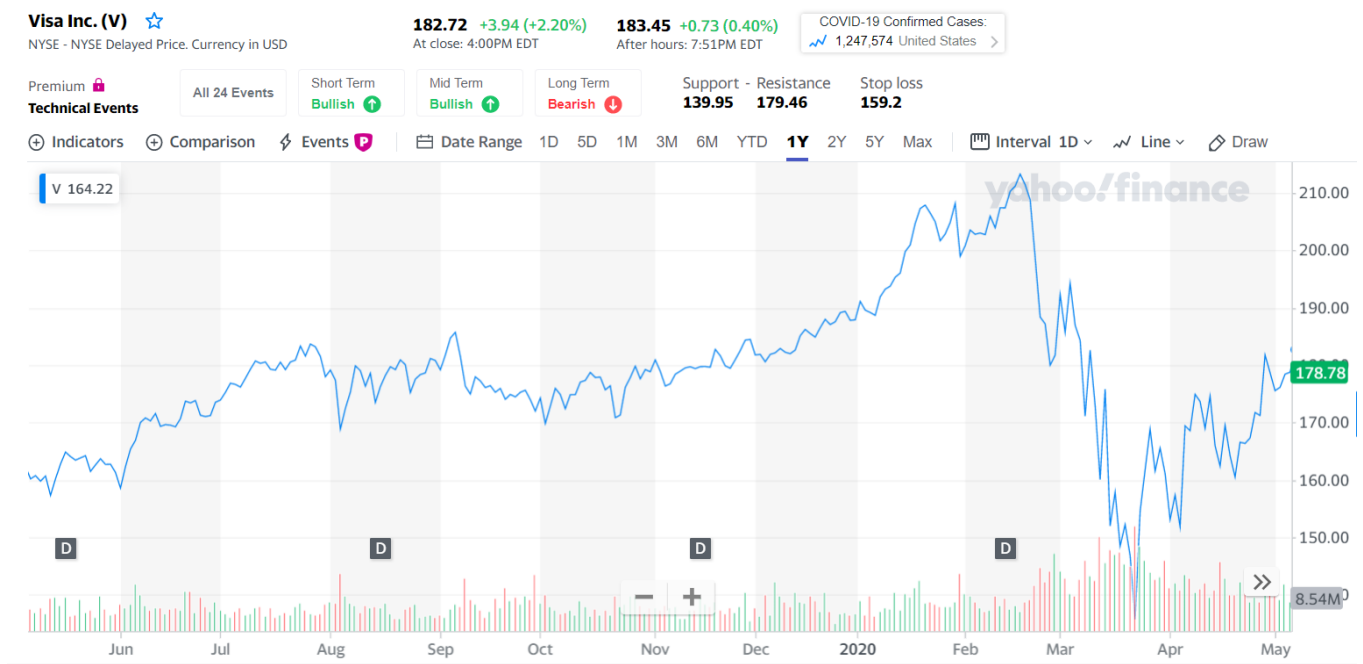
4.5 | Visa

Visa is one of the credit card giants' companies that originally carried the name Bank America and formed by the Bank of America bank. Visa is a publicly traded company that has a long history. Visa acquired a status of blue-chip stock since it takes a leadership role in the credit and debit card industry. The company works with various companies in the world and help to maintain transaction between various financial institutions. The main profit comes from providing payments service around the world. Visa is coming ahead with time since they are offering apps to mobile devices and for other technological machines. Since Visa is participating in the industry innovation, Visa should remain a blue-chip player in the payments industry.

5 | FACTORS AFFECTING THE STOCK PERFORMANCE

In this section we will discuss what are the main factors affecting the investment decisions.

First of all, an investor should think ahead of curve and use a gut feeling while deciding which business brings revolution to the market and could break the traditional approaches in certain aspects of people's lives. For example, Crocs - shoes company



Company	Microsoft	Amazon.com	Apple	Fcaebook	Visa
Market Cap	1.20T	972.91B	1.1T	475.55B	354.81B
Enterprise Value	1.14T	981.09B	1.1T	431.29B	364.29B
Trailing P/E	30.6	84.73	20.02	25.94	29.4
Forward P/E	29.24	66.23	19.65	19.49	28.74
Price/Sales	10.2	3.5	4.34	6.79	15.47
Price/Book	12.16	15.68	12.28	4.71	11.54
EV/Revenue	9.58	13	18.88	24.32	62.23
EV/EBITDA	19.83	107.26	66	57.58	88.01

in a fashion industry, is an evolution not a revolution because the market has been already supplied by the shoes, so the function of shoes has already been implemented by other companies in the market. Overall, fashion industry is very tricky, since the consumer's preferences in fashion changes over time and it is hard to predict how long the firm will keep the sense of fashion idea.

On the other hand, when the Facebook just entered the market and introduced a new way of socializing by using text messages, sharing photos and other media files, so it could be identified as a revolutionary business. That was a step-change in people's communication that led to a new era of social media development. Now the Facebook platform is used for many different audiences: the primary source of socializing converted to an advertising platform and the greatest source of personal data. There are many new business ideas that have been just introduced to the market, such as cryptocurrency trend with the most popular e-coin - Bitcoin, electro-cars that became so popular by a huge mass production of e-cars of Tesla, thousands of applications that aimed to improve people's experience in different aspects of their lives from individual money transfer applications to VR training courses for a big corporations. However, there is still a debate whether any of the described trends are a revolutionary innovation or just evolutionary. For example, according to Diwan (2018) cryptocurrency by itself refers to revolutionary technologies since it has a game-changing impact on the money perception itself. The author also described that now it is time of another evolutionary innovation to come in cryptocurrency world that would drive the further developments in this sector. As a controversy, Elbahrawy et al. (2017) described that cryptocurrency market has an "evolutionary dynamic" in a financial world and considered more as an updated electronic version of the traditional coins. The financial statements could spread the light on other factor related to the structure and proportion of the costs of goods relative to company's revenue. The less the percentage of COGS to Sales the easier company will mitigate the systematic as well as idiosyncratic risks during any recession times. The

thing is that high costs related to inventory, Property, plant, equipment and depreciation make a company unable to be agile and flexible if the recession comes. So, it is important to consider to what extent the company will be able to handle all these risks. Most of the manufacturing companies have a high COGS which should be an area to investigate more precisely other opportunities related to this company and critically think about the investment decision. The market theories also provide the basis to make investment decisions. According to Capital Asset Pricing Model, one company's beta measures the volatility of the stock in comparison to the unsystematic risk of the entire market. The results table shows each stock's beta. The beta of them are not large. Four of them are less than 1, which means when the market return decrease 1 percent, the stock will decrease less than 1 percent. That is a good characteristic for stocks at this special period.

$$E(R_i) = R_f + \text{Beta}_i [E(R_m) - R_f]$$

It is crucial to clarify in the beginning of making an investment decision whether it is a short-term investment or long-term investment. According to Badshash et al. (2018), short-term economic growth, current macroeconomic situations, the interest rate within one year and the level of individual's risk aversion are the main factors affecting the short-term investments. For long-term investment the size of market cap is desired to be bigger, while small cap businesses could bring more returns in the short-term since they have a higher volatility to the overall market fluctuations.

6 | QUANTITATIVE TRADING STRATEGIES

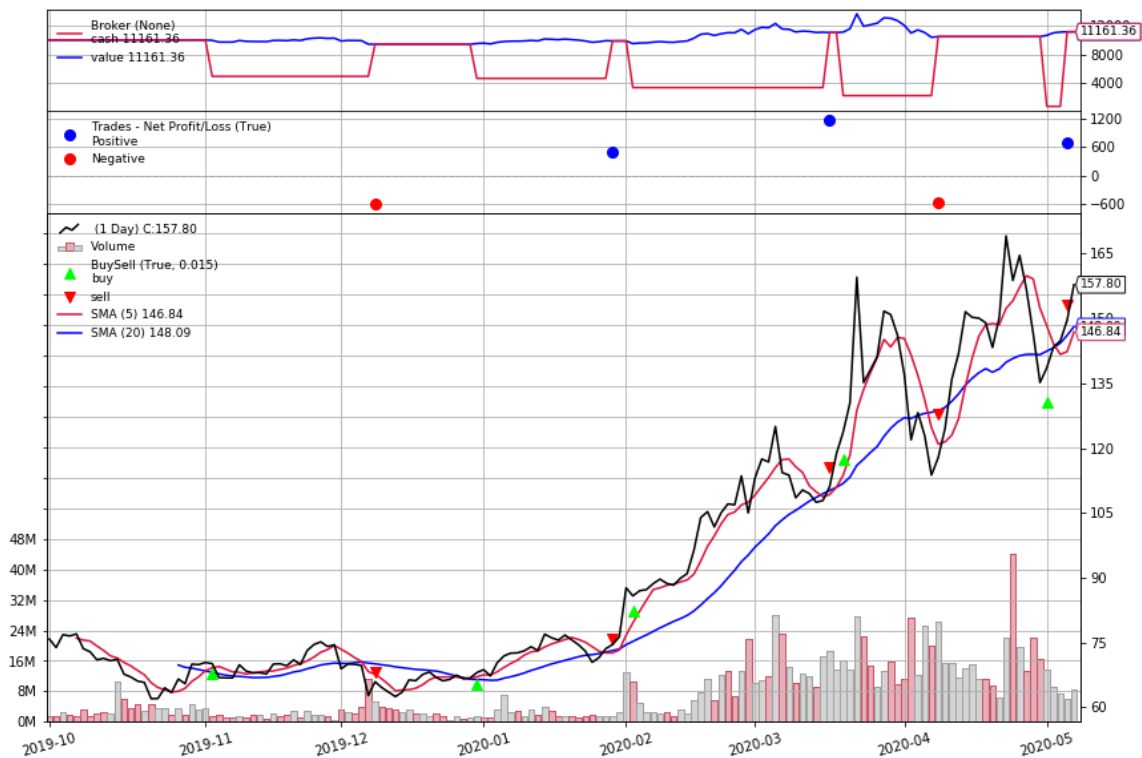
We developed a set of quantitative methods to determine whether a company is good target in short run, and when should we buy and sell the stocks. In general, we have built 3 models here

1. Simple Moving Average Trading Strategy and Backtesting
2. Fama French 3-factor Model
3. Alternative Data Regression Model

Here, we would like to use Zoom for example to demonstrate how our 3 models work. This framework can also be applied to other companies and other industries with slight adjustments.

6.1 | SMA Trading Strategy and Backtesting for Zoom

Here is our result. The green triangle is a buy signal, and the red triangle is a sell signal.



Now let's see how we come to this result and what quantitative analysis we used to build this trading strategies.

6.1.1 | Data Manipulation and Visualization.

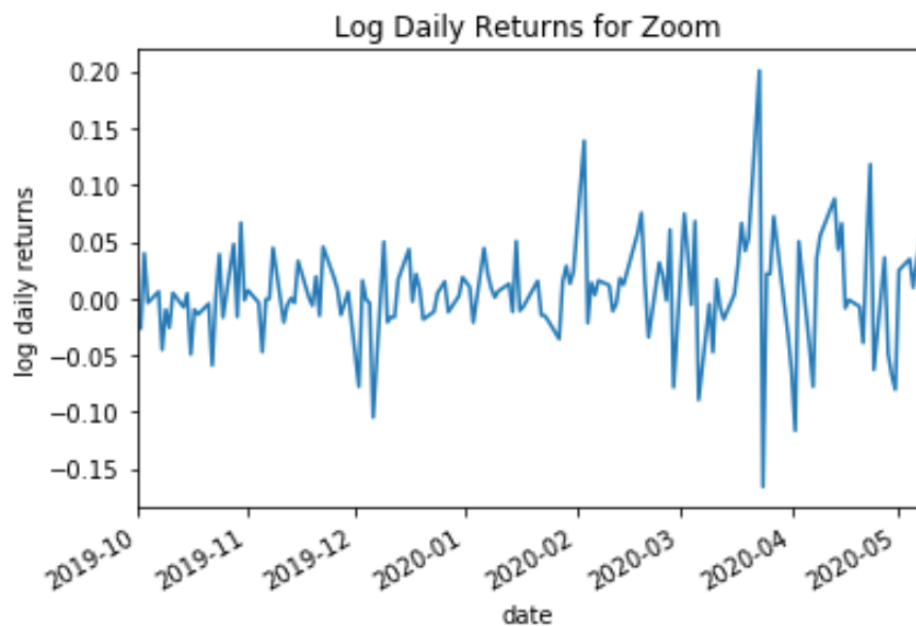
We used Python to first obtain the stock information data from Intrinio Dataset and then cleaned the data. Then we conducted a common financial analysis. First we visualized the data of the daily closing price, and daily returns, from Oct 1st 2019 to May 8th 2020. Here are our results:

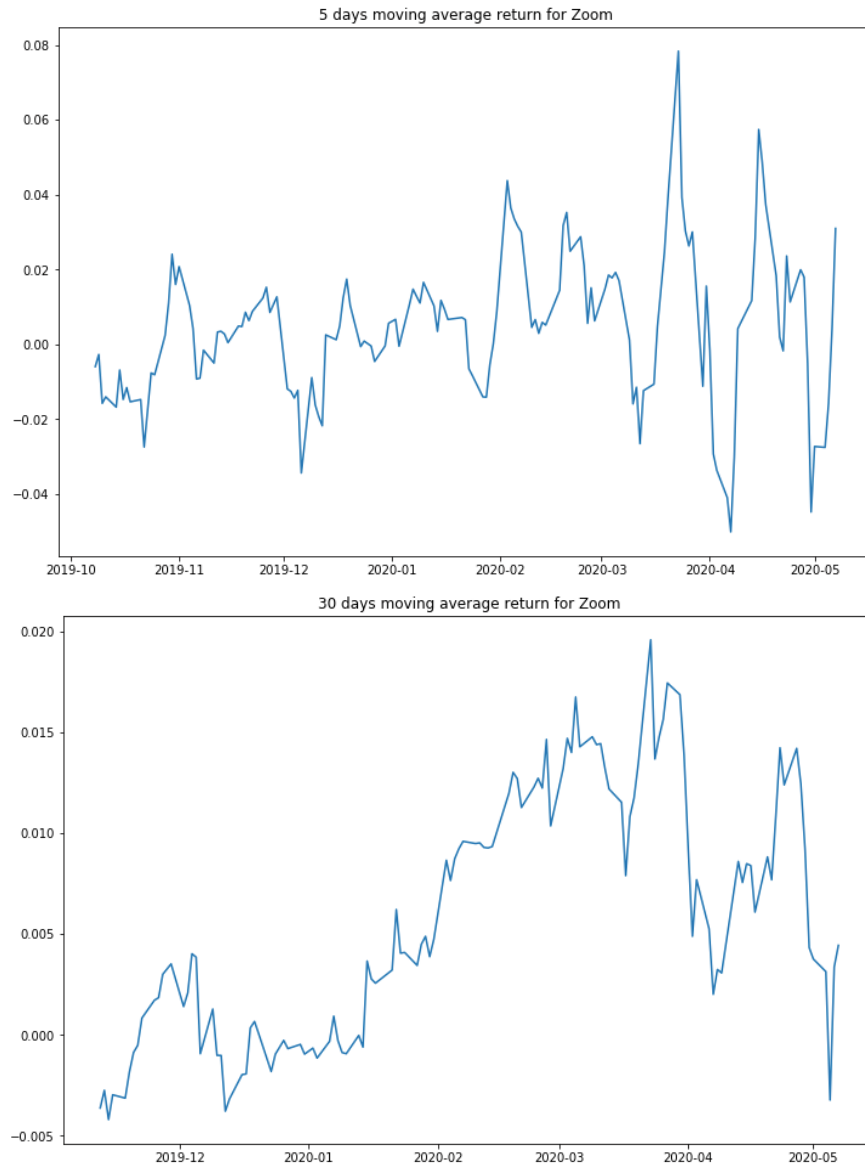
```
zoom_df.head()
```

	adj_close	adj_high	adj_low	adj_open	adj_volume	close	frequency	high	intraperiod	low	open	volume	secid
date													
2019-10-01	75.81	77.4900	75.21	76.43	1384716.0	75.81	daily	77.4900	False	75.21	76.43	1384716.0	Zoom
2019-10-02	73.85	75.7800	73.66	74.50	1388979.0	73.85	daily	75.7800	False	73.66	74.50	1388979.0	Zoom
2019-10-03	76.83	78.4897	73.39	73.90	2607615.0	76.83	daily	78.4897	False	73.39	73.90	2607615.0	Zoom
2019-10-04	76.53	77.7831	75.28	77.00	1799740.0	76.53	daily	77.7831	False	75.28	77.00	1799740.0	Zoom
2019-10-07	76.99	77.4300	75.00	76.99	1432473.0	76.99	daily	77.4300	False	75.00	76.99	1432473.0	Zoom

```
zoom_df.tail()
```

	adj_close	adj_high	adj_low	adj_open	adj_volume	close	frequency	high	intraperiod	low	open	volume	secid
date													
2020-05-01	138.56	141.63	132.6700	136.00	13806992.0	138.56	daily	141.63	False	132.6700	136.00	13806992.0	Zoom
2020-05-04	143.44	144.98	140.4495	140.77	9184748.0	143.44	daily	144.98	False	140.4495	140.77	9184748.0	Zoom
2020-05-05	144.82	148.44	140.8600	144.43	7376349.0	144.82	daily	148.44	False	140.8600	144.43	7376349.0	Zoom
2020-05-06	149.59	150.74	144.0900	145.47	6031085.0	149.59	daily	150.74	False	144.0900	145.47	6031085.0	Zoom
2020-05-07	157.80	162.00	154.0400	154.84	8260764.0	157.80	daily	162.00	False	154.0400	154.84	8388863.0	Zoom





As we can see, the daily returns for Zoom is a stationary process and the mean is approximately zero. After March 2020, the volatility of the returns increased tremendously due to the outbreak of the COVID-19.

6.1.2 | Moving Average Score System

	sma2	sma5	sma8	sma10	sma12	sma15	sma20
date							
2020-05-01	0	1	2	1	1	1	0
2020-05-04	0	1	2	1	1	1	0
2020-05-05	1	0	1	2	0	2	0
2020-05-06	1	0	1	2	1	1	0
2020-05-07	1	1	0	1	2	1	0

We compared the adjacent moving average windows and add 1 for the higher window to its score every day. Above is an example result of our system. For example, on 2020-05-07, the 12-day moving average return is bigger than both the 10-day moving average return and 15-day moving average return, so the score for 12-day moving average return is 2. And, the 15-day moving average return is bigger than 20-day moving average return but less than 12-day moving average return, so the score for the 15-day moving average return is only 1.

Using this system, we calculate the sum of the scores for all the 152 trading days within this period, and we get the total score as follows:

total score	
sma2	89
sma5	153
sma8	149
sma10	148
sma12	145
sma15	140
sma20	36
Max: sma20 Min: sma5	
total score	36 153

So in our strategy, we use 5 as short window and 20 as long window to calculate the moving average returns.

6.1.3 | Our trading strategy:

• Strategy Overview

Given current market conditions and increase in volatility we may be able to take advantage of a simple short/long strategy with the following entry and exit parameters. Generally, if the short moving average return is larger than the long moving average return on each days, it is a buy signal and we should have a long position in Zoom's stock. Otherwise, it is a sell signal and we should short Zoom's stock.

• Entry

When 5 day moving average greater than 20 day moving average buy

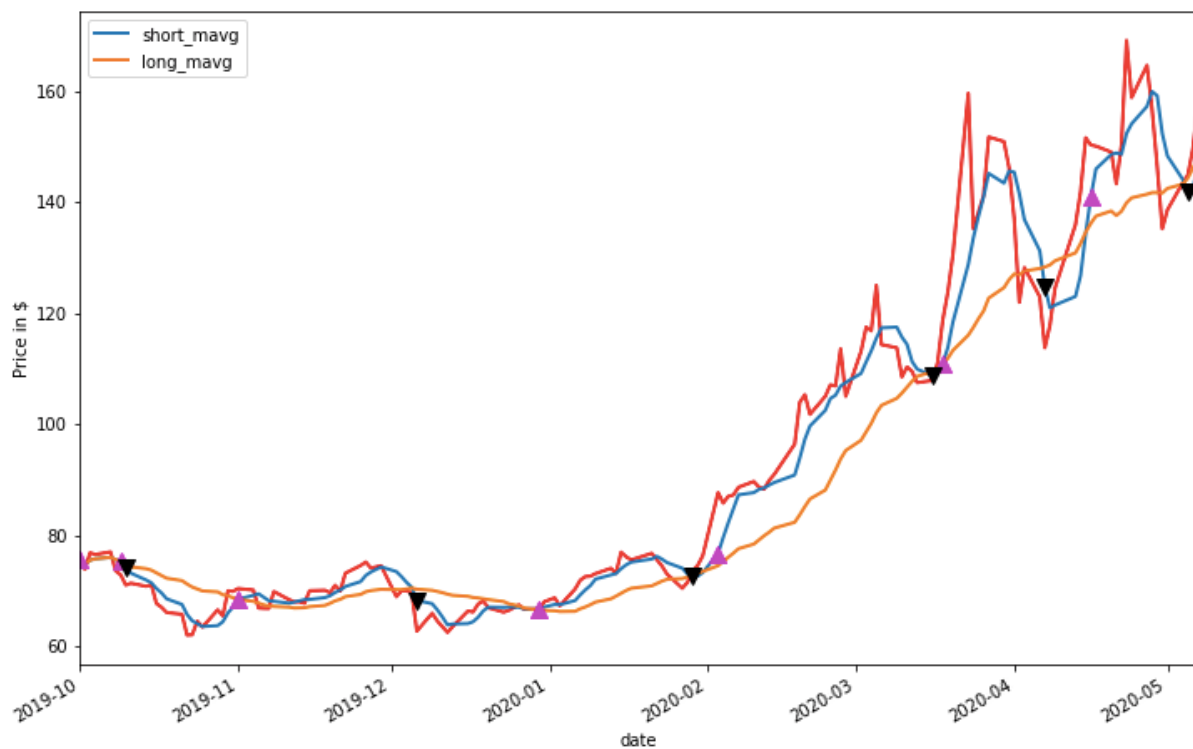
• Exit

When 20 day moving average greater than 5 day moving average sell

• Trade Management and Position Sizing

- One open position either buy or sell at a given time.
- Position size buy/sell 77 shares at a time without
- Backtrader will reject order if not enough funds

	signal	short_mavg	long_mavg	positions
date				
2019-10-01	0.0	75.810000	75.810000	1.0
2019-10-02	0.0	74.830000	74.830000	0.0
2019-10-03	0.0	75.496667	75.496667	0.0
2019-10-04	0.0	75.755000	75.755000	0.0
2019-10-07	0.0	76.002000	76.002000	0.0
2019-10-08	0.0	75.558000	75.600000	0.0
2019-10-09	1.0	75.360000	75.208571	1.0
2019-10-10	0.0	74.196000	74.683750	-1.0
2019-10-11	0.0	73.160000	74.313333	0.0
2019-10-14	0.0	71.922000	73.962000	0.0



The black triangle is a sell signal, and the pink triangle is a buy signal.

6.1.4 | Backtest our strategy

We used USD10000 as our initial capital to invest in Zoom stocks. And to use this money we can buy 72 stocks of Zoom. Based on our strategy above, we can manage our portfolio based on the buy and sell signals. For example:

```
portfolio.tail()
```

	holdings	cash	total	returns	signal
date					
2020-05-01	9976.32	83.44	10059.76	0.024866	long
2020-05-04	10327.68	83.44	10411.12	0.034927	long
2020-05-05	0.00	10510.48	10510.48	0.009544	short
2020-05-06	0.00	10510.48	10510.48	0.000000	short
2020-05-07	0.00	10510.48	10510.48	0.000000	short

6.1.5 | Evaluate our portfolio and trading strategy - Sharpe Ratio

Sharpe Ratio

For 152 Trading days

```
: # 152 Days Sharpe ratio
returns = portfolio['returns']
sharpe_ratio_139 = np.sqrt(152) * (returns.mean() / returns.std())
print(sharpe_ratio_139)

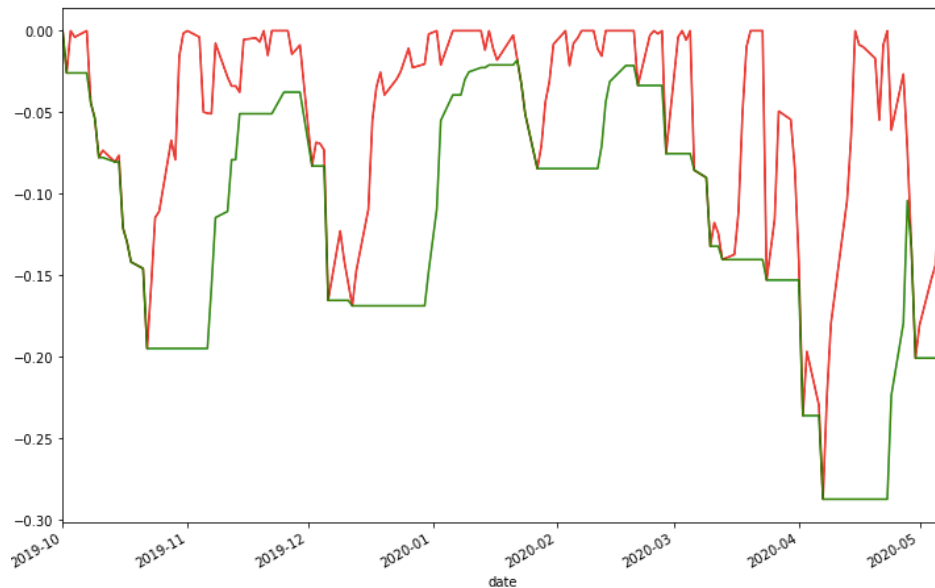
0.3166297965510184
```

```
: # Annualized Sharpe ratio (252 trading days)
sharpe_ratio_252 = np.sqrt(252) * (returns.mean() / returns.std())
print(sharpe_ratio_252)

0.4076901870689562
```

The 152 trading days (2019-10-01-2020-0507) Sharpe Ratio for our portfolio is 0.3166297965510184, and the annually portfolio Sharpe Ratio is 0.4076901870689562. The typical Sharpe Ratio of an actively managed mutual fund is about 0.25. So our portfolio has a relatively high Sharpe Ratio over this level.

6.1.6 | Evaluate our portfolio and trading strategy - Maximum Drawdown



The above red line is the max drawdown in the past window days for each day. And the green line shows the minimum (negative) daily drawdown.

6.1.7 | Compound Annual Growth Rate (CAGR)

What CAGR Can Tell You

The compound annual growth rate isn't a true return rate, but rather a representational figure. It is essentially a number that describes the rate at which an investment would have grown if it had grown the same rate every year and the profits were reinvested at the end of each year.

Calculate the CAGR

```
days = (zoom_df.index[-1] - zoom_df.index[0]).days

cagr_ms = (((zoom_df['adj_close'][-1]) / zoom_df['adj_close'][1])) ** (365.0/days) - 1

print(cagr_ms)

2.544819820760301
```

The CAGR for Zoom is about 2.5448, which means the growth rate for Zoom is quite good.

6.1.8 | Zoom Final Portfolio Value

```
zoom_portfolio_value = cerebro.broker.getvalue()
print('Final Portfolio Value: ${}'.format(zoom_portfolio_value))

Final Portfolio Value: $11161.359999999999
```

```
zoom_pnl = zoom_portfolio_value - startcash
print('P/L: ${}'.format(zoom_pnl))

P/L: $1161.35999999999988
```

The portfolio and our trading strategy that we have will give us a profit of 1161.35 dollars. It shows that we can use this strategy to make a return of $1161.35/10000=11.61$ percentage.

6.2 | Fama French 3 factor Model

In this section we use Fama–French three-factor model to explain how the average rate of return of Zoom in the stock market is affected by certain risk premium factors. The Fama–French model uses three variables adding two factors to CAPM to reflect a portfolio's exposure to the classes of stocks that have tended to do better than the market as a whole: (i) small caps and (ii) stocks with a high book-to-market ratio (B/P, customarily called value stocks, contrasted with growth stocks).

The formula of Fama–French three-factor model is:

$$R_{it} = r_{ft} + 1(R_{Mt} - r_{ft}) + 2SMB_t + 3HML_t + \epsilon_{it}$$

where:

R_{it} = total return of a stock or portfolio i at time

r_{ft} = risk free rate of return at time

tRMt=total market portfolio return at time RitRft=expected excess return

RMtRft=excess return on the market portfolio(index)

SMBt=size premium (small minus big)

HMLt=value premium (high minus low)

Beta1,2,3=factor coefficients

Regression Statistics					
Multiple R	0.443712022				
R Square	0.196880359				
Adjusted R Square	0.186627768				
Standard Error	0.038464115				
Observations	239				

ANOVA					
	df	SS	MS	F	Significance F
Regression	3	0.085231767	0.028410589	19.20299	3.58863E-11
Residual	235	0.347679709	0.001479488		
Total	238	0.432911476			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.019098545	0.00252465	-7.564829155	8.73E-13	-0.024072383	-0.014124707	-0.024072383	-0.014124707
Mkt-RF	0.003248647	0.001416947	2.292708519	0.022749	0.000457105	0.006040189	0.000457105	0.006040189
SMB	0.0099165	0.003522928	2.814845727	0.005294	0.002975943	0.016857057	0.002975943	0.016857057
HML	-0.024182918	0.003308208	-7.309974335	4.16E-12	-0.030700452	-0.017665383	-0.030700452	-0.017665383

The result shows that Beta1 is equal to 0.003249, beta2 is equal to 0.009917, beta3 is equal to -0.02418, and the intercept is -0.019. Moreover, the negative alpha is significant at 95 percent confidence. That may be because Zoom was published from April of last year, and it starts to attract public's attention in recent 3 months. At the company's beginning stage, its valuation is not high. Then when we did the regression of its return from last April to March of this year, its abnormal return is a negative number.

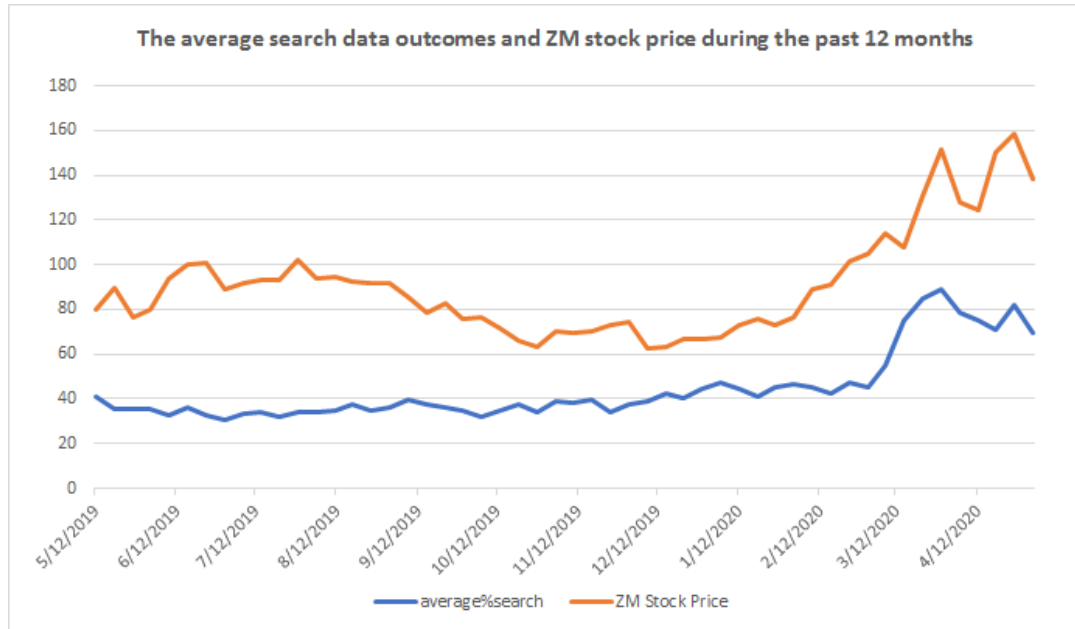
6.3 | Alternative Data Regression Model

Hypothesis testing of alternative data and stock prices of Zoom Video Communications, Inc. (ZM)

Nowadays, search engine became a primary source where millions of people could find answers to all the questions they have. Additionally, search engine is the zero moment of truth in terms of finding and analyzing the information. In our paper, we decided to use this search tool providing not only explicitly asked answers but also analyze the implicit data that stays behind the millions of everyday search requests. So, we used a list of keywords related to our proposed companies as a main independent variable of the alternative data. We collected all related keywords searched and using a google trend statistics for the past one year. As a dependent variable we used stock prices of the Zoom Video Communications, Inc. (ZM) for the same time horizon. Both inputs could be seen in the figure 1.

Then we conducted a Hypothesis test and created a simple regression model for this period and concluded that about 59 percent of all changes in the stock prices could be explained by the number of daily search in the internet. Additionally, we received a p-value almost equal to zero and t-test has significant values we could say that in 5 percent of significance we reject the null hypothesis that a coefficient of the regression is zero and has no effect on the stock price (See Figure 2).

So, in 95 percent of all cases we could see that there search requests effect the stock prices. Also, we conducted a correlation test and came up to 77 percent correlation between search keywords and stock prices which is a pretty high correlation level for those types of data.

FIGURE 1 The Average Search Data Outcomes and ZM Stock Price During the Past 12 Months**FIGURE 2** The Summary Output of the Simple Regression Model**SUMMARY OUTPUT**

<i>Regression Statistics</i>	
Multiple R	0.777811298
R Square	0.604990415
Adjusted R Square	0.597090223
Standard Error	15.08287075
Observations	52

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	17421.23277	17421.23277	76.57920699	1.17301E-11
Residual	50	11374.6495	227.4929901		
Total	51	28795.88228			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	37.67749658	6.432955767	5.856949425	3.64883E-07	24.75652466	50.5984685	24.75652466	50.5984685
average%search	1.1956507	0.136630888	8.750954633	1.17301E-11	0.921219485	1.470081914	0.921219485	1.470081914

7 | STRATEGY

Short-term Investment

In previous sections we have already described the market and suggested to use the below steps to identify possible investment opportunities:

1. Identifying the market which helps to solve the problem and support clients in the era of Coronavirus outbreak. For example: in this category, we can say that the medical industry, online service can flourish;
2. Deciding whether the company has evolutionary or revolutionary product or service;

3. Preliminary separating a short-term and long-term investment;
4. Analyzing the Financial Statement=>Income Statement=> Sales/CoGs/Net Income;
5. Comparing current stock price with historical prices and creating an estimates;
6. Conducting a fundamental ratio analysis: P/E ratio, EV/EBITDA, EV/Sales;
7. Using any available alternative data-sets, such as GoogleAnalytics, satellite data, Google Trends, search engine data by top keywords and so on.

Long-term Investment

1. Deciding whether the company has evolutionary or revolutionary product or service;
2. Analyzing the Financial Statement=>Income Statement=> Sales/CoGs/Net Income;
3. Comparing current stock price with historical prices and creating an estimate;
4. Conducting a fundamental ratio analysis: P/E ratio, EV/EBITDA, EV/Sales;
5. Using any available alternative data-sets, such as Google Analytics, Satellite data, Google Trends, search engine data by top keywords and so on.

8 | RESULTS

Explanation of alternative data results According to the alternative data set we used a Google Trends data. So, for each company we used some industry related keywords and retrieved that online search has been increased in all analyzed sectors. The top search words in March, 2020 were:

- related to online education, online work and online entertainment: "zoom", "skype business", "coursera", "netflix", "online shopping";
- related to food industry: "food delivery", "cook home", "recipe";
- related to healthcare and medicare: "antivirus drug", "antiviral drug", "vitamins" and so on.

Company	Industry	Current Stock Price	Stock Price 3 Months Ago	Price Change In Last 3 Months	COGS/ Revenue	Long/ Short-term	Google Trends	Beta
GSX Techedu Inc.	Online education	41.38	19.63	110.80	25.34	Long-term	Increase	N/A
Tencent	Online education/ entertainment	51.23	42.74	19.86	55.98	Long-term	Increase	1.19
Iflytek	Online education	42.82	32.42	32.08	50.56	Long-term	Increase	1.39

NetEase, Inc.	Online education/entertainment	336.70	309.67	8.73	46.73	Short-term	Increase	0.9
Yonghui Superstores Co., Ltd.	Food	9.89	7.78	21.33	49.85	Long-term	Increase	0.69
JD.com, Inc.	Food	41.63	37.99	9.58	47.43	Short-term	Increase	1.26
Johnson and Johnson	Healthcare	141.36	139.46	1.36	41.95	Long-term	Increase	0.75
Gilead Science	Healthcare	77.93	66.43	17.31	60.1	Long-term	Increase	0.99
Moderna, Inc	Healthcare	28.65	21	36.43	798	Long-term	Increase	N/A
Ping An Healthcare and Technology Limited	Healthcare	74.7	54.7	36.56	44.24	Long-term	Increase	N/A

9 | CONCLUSION

The outbreak of coronavirus does bring new investment opportunities to investors although it has some negative impacts on the global economy. In this report, we developed a seven-step investment strategy to source good deals to invest in. Based on our strategy, we first took a close look at several industries in which there might be potential growth due to the pandemic. Then we sorted specific companies that are overperforming during this period in each industry. To figure out whether they are long-term or short-term investment targets, we tried to calculate the proportion of the cost of goods sold in total revenues to analyze the quality of their business models. After considering the type of their products and services, as well as a business model quality, we identified whether the growth of those companies was a result of the revolutionary or evolutionary innovative purpose of the business, which is important to the investment time horizons. We also conduct research using alternative data sets that totally supported the factors we observed and the performance strategy we developed for an effective investment decision making. Considering the results of the simple regression model and hypothesis testing we came up to the conclusion that search engine data directly illustrates the company's returns and has a great impact on market volatility. This is a good example of behavioral finance could be a great start for the further investigation of alternative data and could be an effective predictive variable for the forecasting future financial returns on the stock market.

For research purposes, we generated a list of potential investment opportunities which is shown in the Result section. So, we suggest that there are good investment opportunities in some industries such as online education, online entertainment, and healthcare. Even if the growth in some industries begins partially due to the specific pandemic situation, there might be consistent growth in the future considering the revolution that some companies generated under such a difficult time. Also, we would suggest investing in stocks that got cheaper from the market crash and had a good growth rate before the pandemic.

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