POST-COVID VTI FUND OUTLOOK

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Report Objectives

- Know what the VTI fund is.
- How we used technical and macroeconomic indicators to evaluate the fund's COVID-19 performance.
- What a COVID-19 economic recovery could look like.

REPORT OUTLINE

- What is the VTI Fund?
- What do technical indicators tell us?
- Which macroeconomic factors should we be mindful of?
- How does the market recover from the COVID-19 pandemic?

WHAT IS THE VTI FUND?

A fund that tracks the performance of CRSP US Total Market Index

The VTI fund employs an indexing investment approach for stocks of all cap sizes. They achieve this through sampling a broadly diversified collection of securities. The fund has a total net asset value of $917.9 billion as of 7/31/2020.

HOW HAS THE FUND PERFORMED?

VTI vs. S&P 500

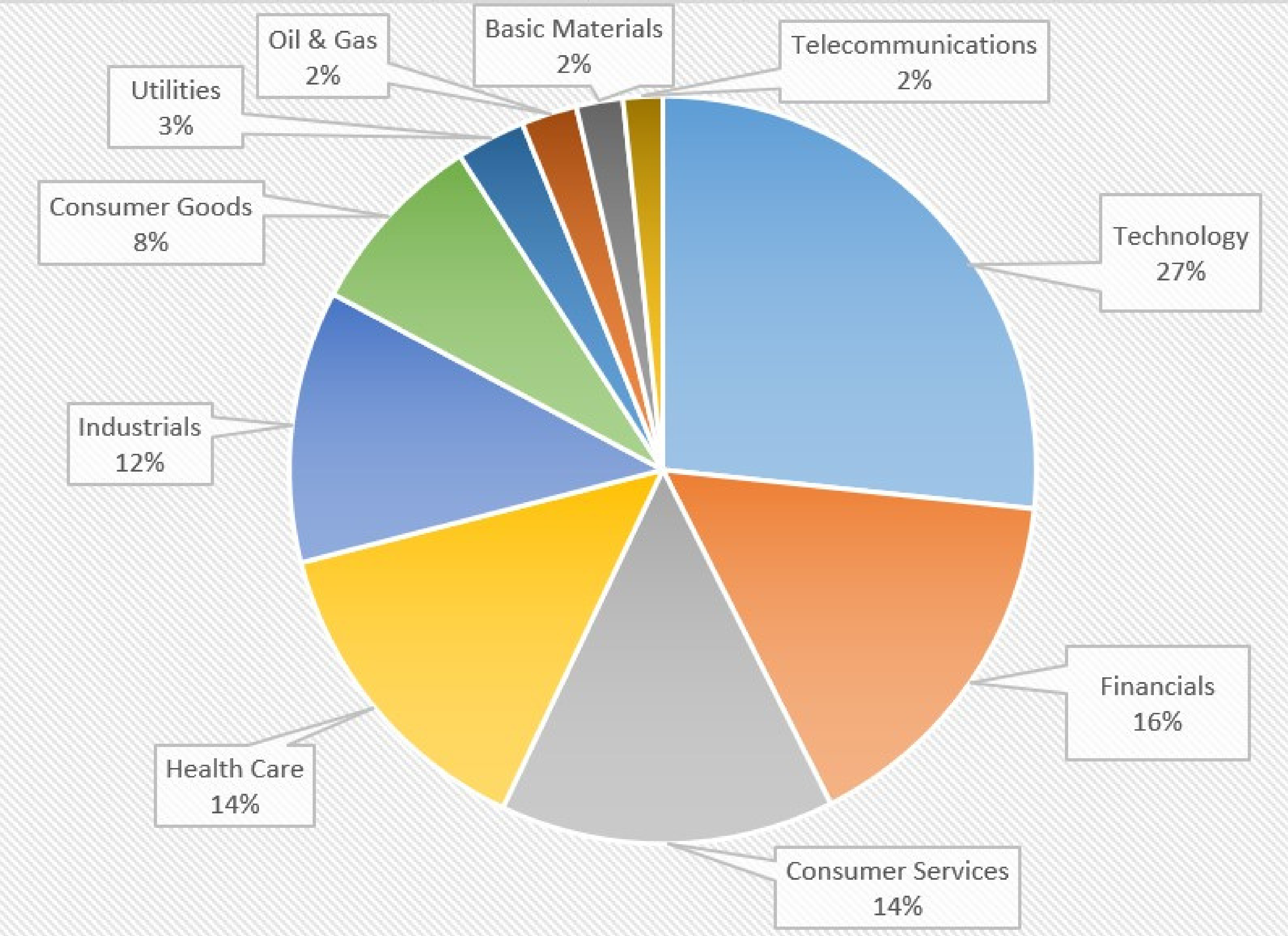
Source: Yahool Finance

As charted above, we see that the VTI fund (purple) has accurately tracked the performance of the S&P 500 (blue) since the fund's inception in 2001.

HOW IS THE FUND ALLOCATED?

Like the stock market, the VTI fund is highly concentrated in technology, financials, and customer services. These sectors account for 57% of the total fund, which poses interesting volatility factors for further analysis.

VTI Sector Allocation



Data Source: https://investor.vanguard.com/etf/profile/VTI. Charted with Microsoft Excel

Top 10 VTI Holdings

Data Source: https://investor.vanguard.com/etf/profile/VTI. Charted with Microsoft Excel

WHAT ARE THE FUND'S CURRENT HOLDINGS?

VTI's top 10 holdings primarily consist of large cap tech companies. Although the fund holds over 3,500 different securities, these 10 comprise 23.9% of the fund's total net assets.

KEY TECHNICAL INDICATORS

A look at some of the key technical indicators to evaluate the VTI fund now and where it is going.

TECHNICAL ANALYSIS

- **Moving Average Convergence Divergence (MACD)**

  A trend following momentum indicator for VTI

- **Bollinger Band Spread**

  Analysis of VTI's trendlines

- **Relative Strength Index (RSI)**

  A momentum Indicator for VTI and the S&P 500 at large

VTI MOVING AVERAGE CONVERGENCE DIVERGENCE

Source: http://www.stockta.com/cgi-bin/analysis.pl?symb=VTI&mode=table&table=macd

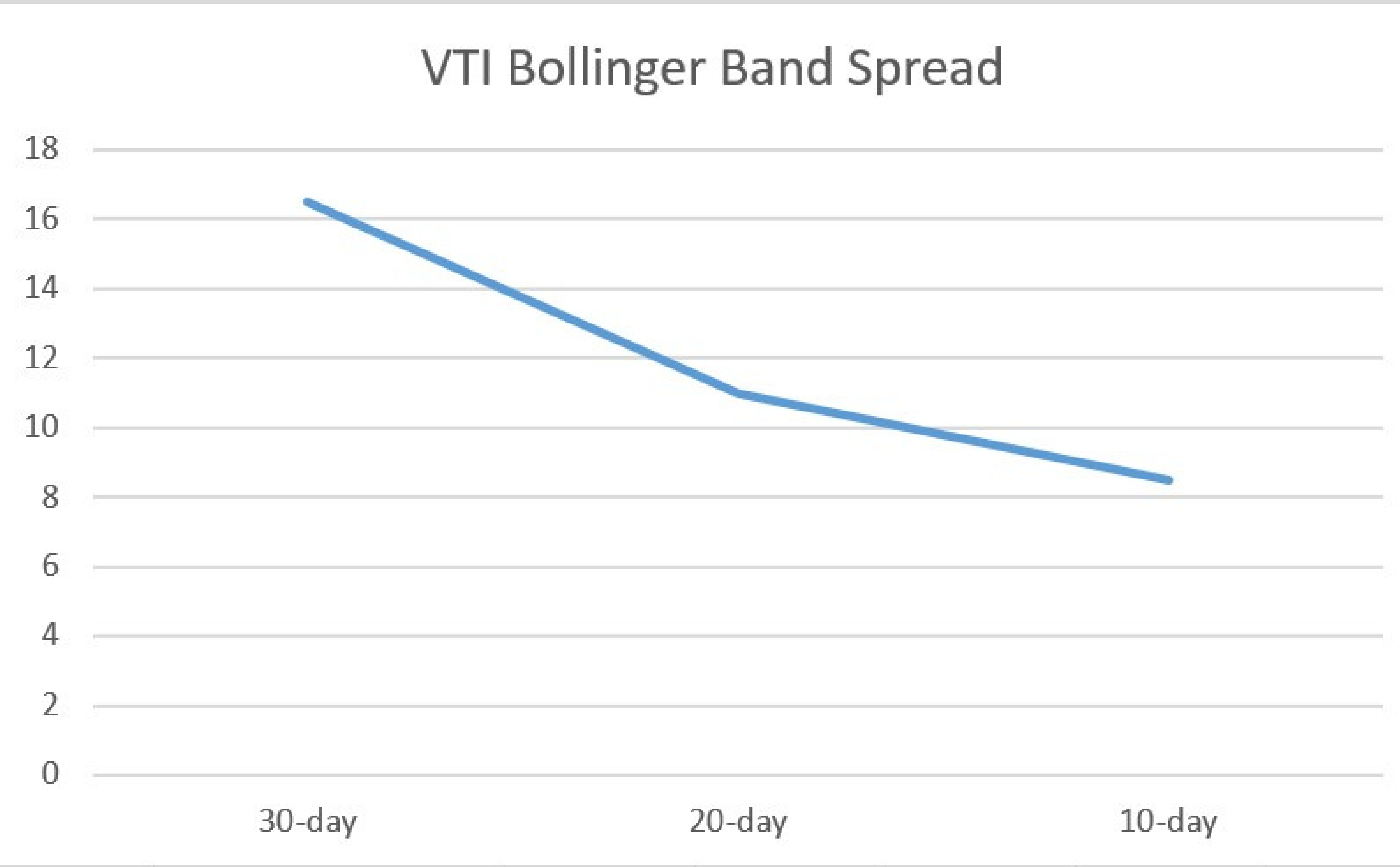
The MACD is the difference between the 26- and 12-day exponential moving averages.

By plotting this line with the signal line (the 9-day exponential moving average), we can identify various trigger points for buying or selling a security. When the MACD crosses above the signal line, it is considered a bullish confirmation while a cross below is considered a bearish confirmation. At the bottom of this chart, we see a bullish confirmation for VTI back in April, as we saw the initial stock market bounce back from COVID-19. More recently, it appears the market has dangerously teetered on the brink and has recently confirmed a bearish market, as seen with the tech sell-offs in the market.

BOLLINGER BAND SPREAD

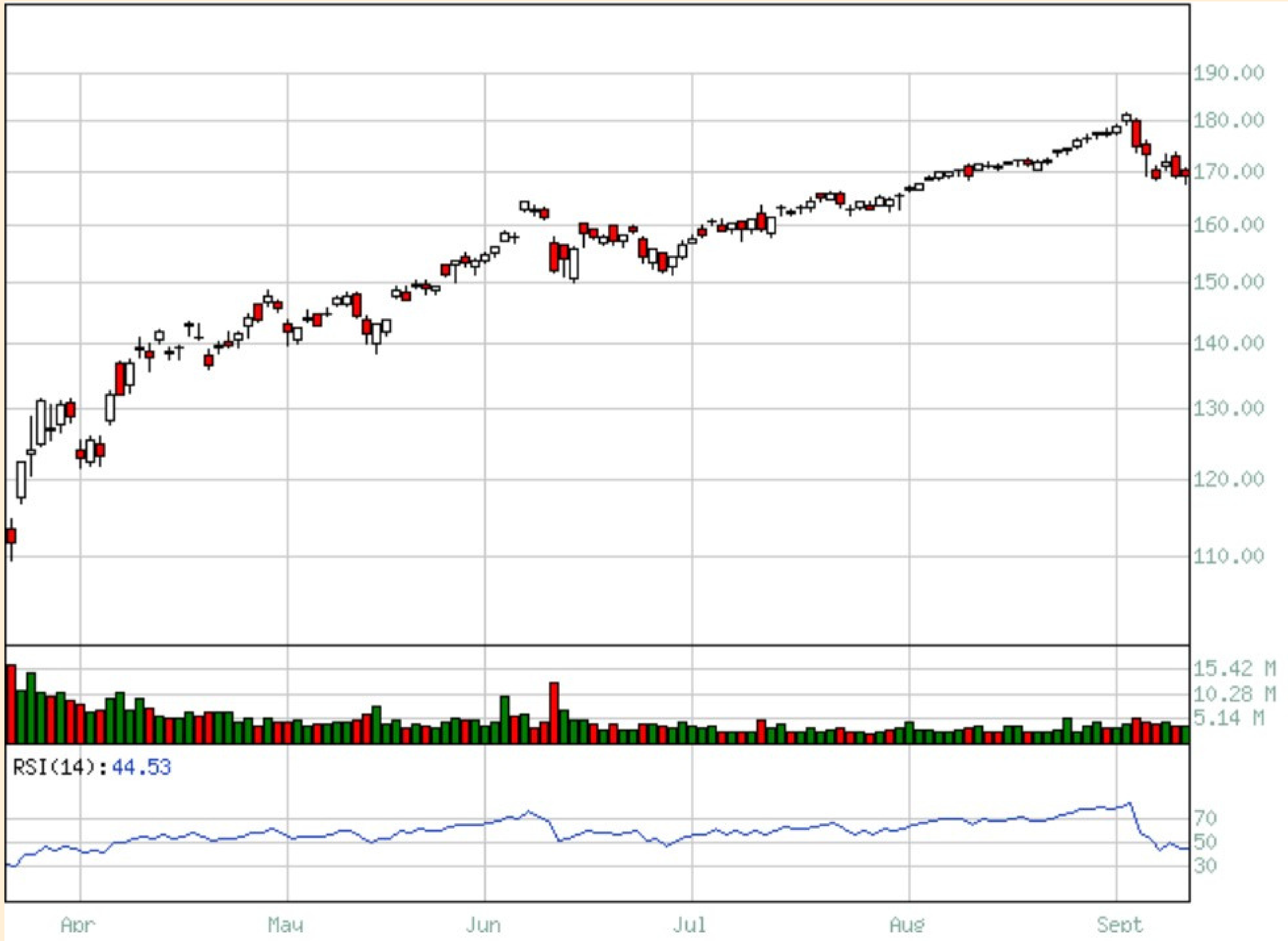
Bollinger Bands adjust to volatility swings in the underlying price of an asset.

These bands plot a security's trendlines 2 standard deviations above and below the 20-day simple moving average of a security's price. Based on price movements, the bands help analysts determine how a security is priced relative to their historical performance. A "squeeze" occurs when the distance between the upper and lower band (spread) becomes narrower and generally indicates a period of future increased volatility (and trading opportunities). However, the bands by themselves do not say when or in what direction the volatiliy will occur. For VTI, we see that a squeeze was occurring. However, like any good investor will say, we need to look at a combination of factors.



Data Source: marketwatch.com. Charted with Microsoft Excel

VTI RELATIVE STRENGTH INDEX



Source: http://www.stockta.com/cgi-bin/analysis.pl?symb=VTI&mode=table&table=rsi

The relative strength index is a momentum indicator for recent price changes.

The RSI is a momentum oscillator that helps investors contextualize the speed and magnitude of price movements. It always has a value between 0 and 100, with values over 70 regarded as overbought while values under 30 are oversold/undervalued. By analyzing the general trend of the RSI, we can better gauge underlying market sentiment towards a specific security. In the case of VTI, we see that the fund hovered around and above 70 before the recent market trend reversal.

S&P 500 RELATIVE STRENGTH INDEX

The S&P 500 gives us a more complete view of the market and confirms what we saw in the technical indicators of VTI. Like many analysts and economists warned, the market was overdue for a correction.

Source: https://www.crystalbull.com/stock-market-investment-strategies/RSI-chart/

WHY USE THE S&P 500?

Unlike other economic indices, the S&P 500 captures a wider breadth of the total economy through 500 large-cap companies across a broad range of sectors. For comparison, the Dow Jones Industrial Average only contains 30 companies in a limited number of sectors. This allows the S&P 500 to reflect the market more accurately through its broader scope. However, the S&P 500's limited representation of small-cap or foreign companies poses some limitations on its ability to measure the whole economy. In the context of analyzing the VTI fund, these inaccuracies are negligible.

WHAT DOES THIS ALL MEAN?

- From the technical charts, it is clear that the market was headed for a correction.
- It was not a matter of "if," it was a matter of "when."
- This was realized with the tech sell-off at the beginning of September 2020.
- With the sell-off over and technical indicators still adjusting, how do we evaluate the future outlook for VTI with COVID-19?
- Macroeconomic factors could be the key.
- Like any other investment, VTI is highly dependent on the macro economy.
- This connection is further strengthened by VTI's historical success in tracking the total stock market.

KEY MACROECONOMIC CONSIDERATIONS

COVID-19 Outlook

What is the path forward after a global pandemic?

Market Participation Outlook

With 2 major financial events in the span of about a decade, how will personal and institutional investors adapt?

The Federal Reserve System

As the central banking system of the United States, what are the implications of the Federal Reserve's actions?

DOES A VACCINE SOLVE EVERYTHING?

The public demand for a solution to the COVID-19 pandemic has led to a historic race to develop a vaccine. The vaccine development process, which traditionally takes 10 years, is set to take place in a matter of months. While a vaccine is widely regarded as the key to moving past the pandemic, many experts and citizens alike hold concerns about the rapid development of a COVID-19 vaccine. One of the key parts of developing a safe vaccine is mitigating its side effects. This requires data collection over a long periods of time. However, the push for a vaccine does not give this luxury to researchers, leading to concerns about the long-term health implications of a vaccine. These concerns have already manifested themselves in clinical trials, with AstraZeneca pausing their vaccine trials in early September 2020. Regardless of when a vaccine is cleared for public use, we will need time to fully understand its effect on public health.

COVID-19 RECOVERY TIMELINE

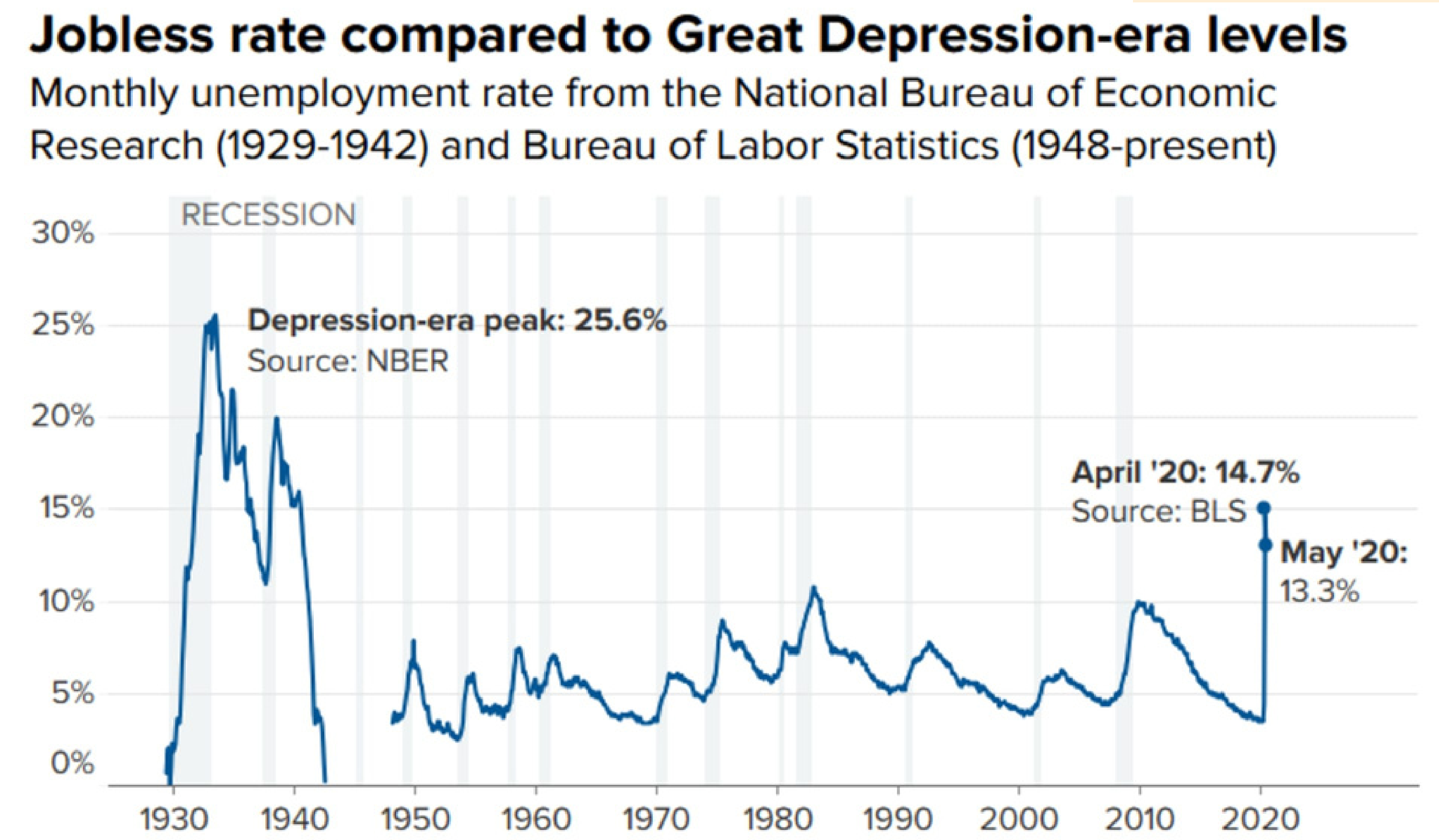
Source: https://talkmarkets.com/content/us-markets/2008-financial-crisis-and-stock-crash-causes-and-lessons?post=173238

The 2008 Financial Crisis proved that a complete economic recovery takes time.

As labelled in the graph, a full recovery from the 2008 financial crisis took about 5 and a half years. Although the nominal market drop from COVID-19 was not as steep as 2008, the long term economic and social impacts are certainly on par, if not greater. The financial impact of COVID shutdowns combined with health concerns of a rushed vaccine will make a return to normalcy much more complicated than anticipated. The bottom line: COVID-19 has impacted far more than just the numbers and a complete recovery will take years.

Market Participation Outlook

THE STOCK MARKET - ECONOMY DISCONNECT



Source: https://www.cnbc.com/2020/06/03/understanding-the-huge-disconnect-between-the-stock-market-and-economy.html

When the coronavirus ushered in a wave of shutdowns across the US, the market saw a 34% drop between February and March. Despite over 100,000 virus-related deaths, civil unrest, and historic levels of unemployment, the stock market has since rallied back over 43%. Why? Because the stock market is not the economy. The stock market is forward looking and not an accurate reflection of current economic conditions. In this situation, the entire market is valuing companies in a post-COVID-19 economy. This has led to heavy speculation across the market, and a market correction (we also saw this in our technical analysis). Moving forward, we must keep in mind that the market is more speculative and volatile than normal, in spite of our current economic realities.

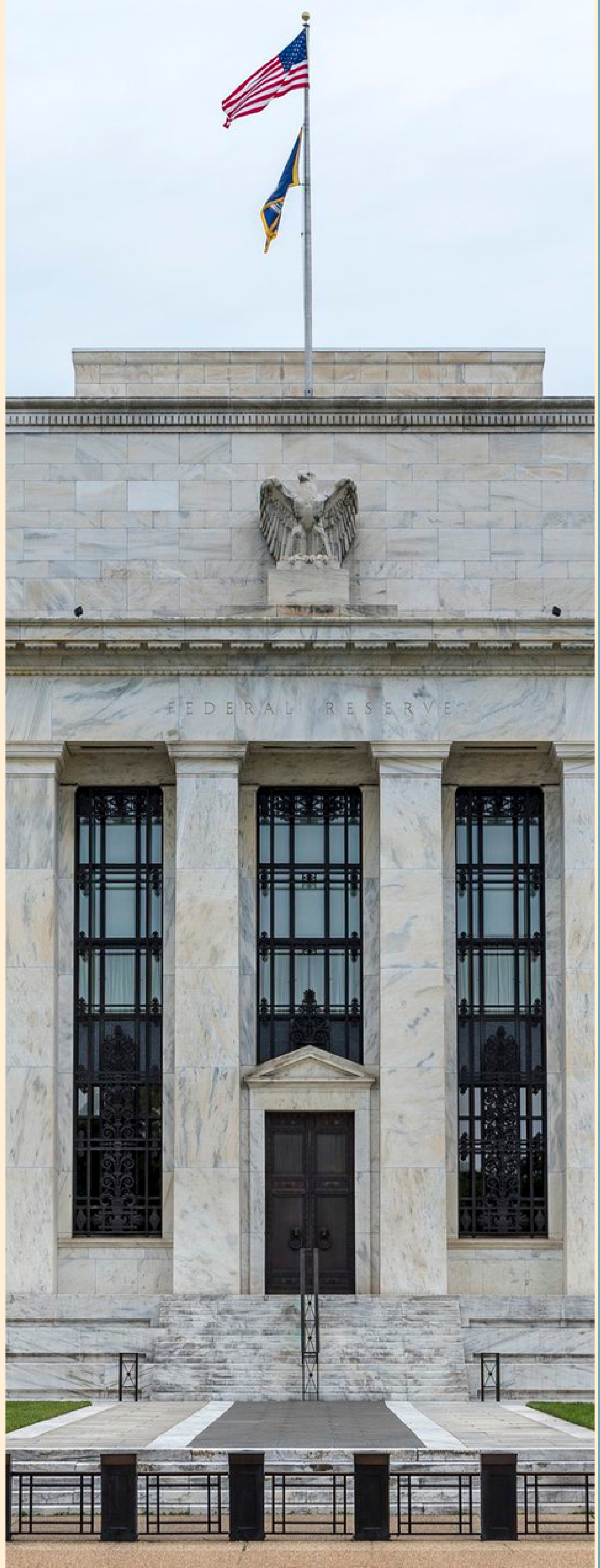
Market Participation Outlook

HOW WILL INVESTORS ADAPT?

With 2 historic financial events in the span of a decade, institutional and personal investors are even more driven to ensure long-term financial security. This had led to massive influx of investors into the market. With apps like Robinhood, investing has only become more accessible. This had led to increased volatility within the market, as inexperienced traders buy stocks without an understanding of their fundamentals. These irrational price movements not only pose new trading opportunities, but also impose an added factor of risk within the market. Public understanding and media attention of certain industries will undoubtedly play a bigger role in the future. With increased market participation, investors will face greater risks but also bigger opportunities.

WHAT ROLE DOES THE FEDERAL RESERVE PLAY?

The Federal Reserve System is the primary policy-making institution responsible for regulating the banking industry and ensuring stability of the financial system. Consequently, they serve as the key part in fighting recessions while avoiding inflation issues. They do this through 3 main tactics: interest rate cuts, quantitative easing, and forward guidance. By cutting interest rates, the Fed hopes to spur new businesses investments and encourage purchases of major durable goods like cars and houses. However, interest rates can easily approach 0 during recessions. To avoid negative rates, the Fed uses quantitative easing by purchasing long-term debt issued by the federal government, Fannie Mae, and Freddie Mac. This allows the Fed to indirectly inject more money into the banking system, beyond simply paying interest on to banks' excess reserves. Lastly, they offer forward guidance to communicate future interest rate movements, allowing consumers and businesses to make informed investment decisions for the long term. These tools enable the Fed to fulfill its dual mandate: To sustain maximum level employment that is consistent with stable prices (inflation of ~2%).



The Federal Reserve System

THE FED'S CURRENT APPROACH

Federal Funds Rate

Source: https://tradingeconomics.com/united-states/interest-rate#:~:text=In%20the%20long%2Dterm%2C%20the,according%20to%20our%20econometric%20models.

The Fed's recent forward guidance announcement indicates no interest rate hikes until end of 2023.

With no interest rate hikes through 2023, banks and consumers can invest with less restrictions as the economy recovers from COVID-19. While this bodes well for spurring an economic recovery, many bankers and economists have raised concerns about inflation growing beyond the desired 2%. In fact, Minneapolis Fed President Neel Kashkari dissented the announcement and proposed an alternative plan to keep near-zero rates only until core inflation reaches 2%. Many interpreted the Fed's announcement as a signal for a prolonged COVID-19 recovery. Many also expect a significant shift within the financial industry as the market adapts to sustained, near-zero interest rates. As many other indicators suggest, the economy well take time to recover and will not follow a simple "V" shaped curve.

VTI Future Outlook

HOW WILL THE VTI FUND PERFORM MOVING FORWARD?

- A correction for the heavy speculation and overvaluation in the COVID stock market already took place with the tech sell-off in September 2020.
- As we get closer to a post-COVID world, the economy will slowly recover and realize the gains the market and the Fed is expecting.
- Because of these factors, Shorting the VTI fund would not be a wise investment decision, as it has been historically accurate in its tracking of the market and economy overall.
- However, I would consider shorting various other ETFs or stocks that have higher concentrations in a singular sector.
- Once a vaccine is approved, I anticipate there over optimism and excitement in the market. This would offer sound shorting opportunities.
- These trades would have to be evaluated at that time, with a deeper look at their fundamentals and technical indicators.