BT4016 Final Report

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Recap of Strategy

As mentioned earlier in the previous reports, our investment time horizon is spanning over 5 years and we are adopting a high-risk based strategy with the following asset allocation:

50% Equities, 28% Bonds, 12% Commodities, 10% Cash

1. Trading Strategy

We are keeping 10% cash for emergency situations where we could minimise losses by utilising this amount of liquid cash. For bonds, will have a mix of corporate and treasury bonds. While treasury bonds are backed by government and deemed to be safer, we are willing to take more risk and purchase corporate bonds as well.

Equities
As for equities, we are adopting a top-down strategy. First we identified that we will only be investing in the US stock market[1]. Both NYSE and NASDAQ are the top 2 stock exchanges in terms of market capitalization. Companies listed on these markets are required to meet stringent standards, and are usually larger companies. We believe that these companies listed on the US stock exchanges will be more reliable. We then consider buying stocks from the higher performing sectors and industries. Extensive research was conducted so that we understand what each company does and read up on the latest occurring events, ‘buying what you know’. Refer to appendix on breakdown of stocks selected and method used for selection. The stocks, ETFs and bonds selected are aimed at diversifying our portfolio to reduce the risks taken in our portfolio.

Bonds
Our team has invested in several treasury bonds, which are deemed as risk-free bonds. Additionally, we decided to take up a few corporate bonds as with higher risks and hopefully higher return. This fits our trading profile of high risk-based trading.

Our strategy in selecting the corporate bonds to purchase is to first look at the credit rating of the corporate bond provided. Then, we would look up relevant information regarding the company involved. By gauging the recent economic performance and financial stability of the companies that we are interested in, we would then decide on whether it is financially sound to purchase the bond. Other than that, we would also use interest rate risk and credit spread to gauge the amount of risk involved in the various bonds that we have purchased.

Commodities
For our commodities, we have decided to dabble in precious metals through the purchase of ETFs. Our team feels that gold and silver are relatively stable as they are physical-backed and

[1] Some ETFs bought contains assets from other markets i.e SPDR contains 2% Europe.

would never lose its value in the market. There might be fluctuations in the prices but the value of gold and silver would likely climb in the face of severe market scenarios due to its inverse relationship with the US dollar.

Gold can be used as a hedge to protect against economic events like currency devaluation or inflation. In addition, gold is viewed as providing protection during periods of political instability as well. Since our equities are largely based on US companies, if there was a negative US market movement, it would result in a dip of the US dollar which would in turn cause an increase of value in our Gold ETF. This can be used to counteract the dip in prices of our equities based in the US and also utilised as a risk reduction strategy. As for the silver ETF, our team decided to purchase one that is largely popular, also known as the iShares Silver Trust ETF. The iShares Silver Trust is most appropriate for beginning investors who are looking to gain exposure to silver or engage in speculative trading of silver without actually buying silver itself. Also, the fund is a useful tool for investors who want to diversify their portfolios and help protect against inflation. Our team feels that the iShares Silver Trust is a commodity ETF that could be useful in risk reduction of our portfolio.

2. Risk Management of Portfolio

Value-at-Risk(VaR)

We have calculated the Value-at-Risk for our portfolio using log-returns of our stocks for both 95% confidence level and 99% confidence level. The parameters that we used are 20 years from data from 1999 to 2019 as obtained from Yahoo Finance with calculated mean of returns(mu) and standard deviation of returns(sigma) on a portfolio value of value P. For more details, a jupyter notebook has been attached for further reference. By calculating the log-returns of each stock, we also inserted a variance-covariance function which is based on a normal distribution to derive the daily VaR of our portfolio at 95% and 99% confidence level:

	VaR(95%)	% of principal amount	VaR(99%)	% of principal amount
Daily	$9709	1.62%	$13732	2.29%
Monthly	$44492	7.42%	$62697	10.5%

With these results, we can say that with 95% confidence that we expect our worst daily losses to not exceed 1.62%. By using these calculations, we are able to assess the risk of our portfolio and gauge if it is too risky for our current investment choices. Our team feels that a possible daily loss of 1.62% is still within an acceptable range of risk.

We decided to calculate the VaR for our equities and commodities only, which brings our principal amount to approximately $600,000. Our bonds are excluded in our VaR calculation as we are unable to obtain 20 years of data for some of our purchased bonds and also, it is much more complex and relatively difficult to calculate VaR in the mixed portfolio. To compensate for that, we have included the credit spread of our bonds in the report to account for the risk of our bonds.

VaR modelling is a popular risk management method that quantifies a portfolio's potential loss as well as the probability of the loss occurring. However, this method requires certain assumptions that limit its precision. An example of that would be the makeup and content of the portfolio measured would be assumed to be unchanged over a specific period. Even though this might be acceptable for a short-term period, it might prove to be less accurate in the long run. Therefore, our team also uses other metrics such as beta and volatility to measure the amount of risk taken by our portfolio. The VaR of individual stocks can also be found in Appendix.

Beta & Volatility

Beta is a measure that is used in analysis to determine the volatility of an asset or portfolio in relation to the overall market. The overall market would possess a beta of 1.0 and the value would indicate to us how far does our portfolio deviates from the market in general. If the beta value is >1, it shows that the portfolio would be affected more than the market over the long run, which would indicate higher amount of risk faced by our portfolio and vice versa. However, stocks or equities that possess a high beta value would yield more returns in the future which is in line with the current trading approach that we are undertaking. Thus, beta has been used as a popular risk-reward measure to determine the amount of risk that individual portfolio are facing.

Other than using VaR to assess the portfolio risk that we are facing, we also calculated the beta of our portfolio by using a simple weighted average. For this calculation, we only used the data from our equities stock to calculate the portfolio beta. We obtained the beta values from StockTrak and proceeded to calculate our portfolio beta.

Stock	Beta	% of portfolio value	Weighted Beta
Apple	1.08	0.04668377	0.0504
Twitter Inc	0.19	0.01855251	0.0035
Microsoft	0.97	0.05567	0.0540
Alibaba	1.87	0.02560106	0.0479
Invesco QQQ Trust(ETF)	1.11	0.05299037	0.0588
Voya Financial Inc	1.51	0.03	0.0453
Manulife Financial Corporation	1.46	0.03	0.0438
Aflac Incorporated (AFL)	0.51	0.02	0.0102
JPMorgan Chase & Co.	1.19	0.03307332	0.0394
AT&T Inc	0.76	0.02506609	0.0191
Comcast	0.99	0.02593956	0.0257
Brookfield Renewable Energy Partners LP	0.68	0.02613877	0.0178
TerraForm Power, Inc.	0.14	0.00938037	0.0013

Energy Select Sector SPDR ETF	1.38	0.02512117	0.0347

The calculated value of our portfolio turns out to be **0.472** which is less than 1. This shows that our portfolio is less risky as it would move less than the market and would not be affected as much by market changes or movements.

The VaR, beta, PE ratio for individual stocks, and how we decide on the buying price can be found in Appendix.

Risk Tolerance

Risk tolerance is the degree of variability in investment returns that an investor is willing to withstand in their financial planning. A realistic understanding of our investment ability and willingness should be adopted to gauge the amount of risk that we are willing to face.

For our tolerance of loss, we set it at 5% of our portfolio value. With our current portfolio, our team feels that a threshold of 5% loss is manageable. If our portfolio losses exceeds 5%, we would halt all trades and reevaluate the current trading strategy that our team is adopting. Other than adopting the methods to bolster the damage through purchase of options and utilisation of liquid cash, we would review the strategies adopted and either improve on the current one or possibly develop a new strategy to better fit our portfolio. There are 5 steps for us to determine our risk tolerance:

1. Describe our investment goal
2. Consider our withdrawal plans
3. Determine comfort level
4. Assess your answers
5. Redefine your asset allocation

Through these 5 steps, our team aims to reassess our risk tolerance yearly and calculate if our current portfolio is able to manage within the current market, if not, we would redefine our asset allocation to better fit our level of risk tolerance.

Risk Management Strategies.

Asset allocation of portfolio (Diversification)

Studies have shown that close to 90% of investment returns are determined by the asset allocation of the portfolio. Therefore, it is critical to carefully select the right asset allocation for our portfolio so that it does not face excessive risk or is highly susceptible to market changes. A good asset allocation grants us great flexibility and lesser risk.

Sector (50% of total portfolio)	Allocation	Stocks/ETFs currently holding
Information Tech	20%	AAPL, TWTR, MSFT, BABA, QQQ(ETF)

Financial Banking	15%	VOYA, MFC, AFL, JPM
Communication Services	5%	T, CMCSA
Energy	6%	BEP, TERP, XLE (ETF)
Others (Blend)	4%	SPY (ETF containing blend of industries)

By breaking down our equities into different industries and sectors, we aim to alleviate our portfolio risk so that it is not susceptible to one type of market movement but rather, versatile enough to handle different types of economical changes. Not only that, we also invested into sector ETFs where the stocks are based on several companies instead of dependent on one company's performance. By spreading out the allocation, we diversified our portfolio, reducing risk in the process.

Cash allocated for contingency plans
10% cash is withheld for emergency situations where we could minimise losses by utilising this amount of liquid cash that we hold to purchase options or equities at very low prices. Depending on each sector and industry performance, we will consider purchasing PUT options that allow us to protect ourselves against sudden price dipping or CALL options in contrasting industries where it could be exercised in a sector-specific situation.

During a financial crisis, the government may opt to adopt an expansionary monetary policy to encourage spending from firms or households through lowering interest rates. This makes it less expensive to borrow money, while disincentivizing them from keeping their cash in a bank. When interest rates fall, the price of bonds will rise. Selling our bonds during such situations will allow us to gather liquid cash to purchase more assets in other asset classes, such as stocks, on their low.

Stop Loss Points
Suitable risk management would help to cut down losses so that we would be able to keep our profits up in the long run. With that, our team has considered setting stop-loss (S/L) points to avoid losing a large chunk of our portfolio. Among all the stocks, only TWTR showed a drastic drop of 34.53% (see Appendix 6.2.5 Equity Performance). After evaluating our portfolio as a whole and given that most of the other stocks are doing pretty well, we decided to keep TWTR believing that the price will likely increase in the future and the drop in price would reach 50%, hence no stop-loss was set. Moving forward, if TWTR continues to drop past 40%, we will be selling it to avoid further losses with a stop-loss set.

Acceptable Risks

Bad economic situation in Hong Kong
The current turmoil in Hong Kong would definitely affect the outlook of our portfolio in the short run. Due to the turmoil, it would result in an economic downturn and possibly the crashing of HK economy and market. Hong Kong has been treated as an international hub for companies who

are looking to do business in China. These events would impede the growth of our stocks in our portfolio and risk the dip in the stock prices. Since the bulk of our stocks are based on US companies, we predict that our portfolio would not be largely affected by the current events going on in Hong Kong. Even if it does, we would be able to use our reserve of 10% cash to counteract any potential dip in the event that our portfolio is affected. Our team feels that this situation would only affect us in the short run, however, in the long run, we feel that it would die down and would not influence our portfolio.

Trade War between the US and China

Earlier this year in May 2019 when Google had to cut off Huawei with Android support amid the trade war between US and China, Google stocks took a dip. Then on 5 August 2019, the Dow Jones Industrial Average plunged 2.9%, to close at 25,717.74 while the S&P 500 dropped nearly 3% to 2,844.74[2]. The Nasdaq Composite lagged, falling 3.5% to 7,726.04. It was the worst percentage drop for all three indexes this year. However, every time the Trump administration touts positive development on trade with China, stocks would spike. The past few months have seen several fluctuations in the US stock markets, and today, many stock averages the S&P 500, Dow and Nasdaq Composite have scored new records. We are rather skeptical that the Trump administration will have a severe impact on the market and it would be an acceptable risk to take by investing only in US stock markets NASDAQ and NYSE.

Unacceptable Risks

US Stock Market Crash

Given that all our stocks are traded on US stock markets, an unacceptable risk would be the crash of the market. President Donald Trump had warned in a tweet amid the Ukraine whistleblower inquiry that the stock market would melt down if Congress successfully impeached him. However, we believe that such a risk is not likely to happen, and if we observed signs of such an impending event we may consider investing in other countries stock markets. If it were to happen, it would greatly impact our portfolio value despite our risk management techniques as it would be an event that could potentially affect markets on a global scale and no amount of risk management techniques would be sufficient in safeguarding our portfolio.

Bond Risk

Interest Rate Risk

Interest rate risk is the risk taken on by bond investors if interest rates rise after they buy the bond, which will lower bond prices as newly issued bonds will be more attractive in the market. Generally speaking, long-term bonds will incur a higher risk that interest rates will increase, therefore these bonds will offer higher expected rates of return than shorter-term bonds. This is known as maturity risk premium.

[2] https://www.cnbc.com/2019/08/05/us-futures-amid-trade-turmoil-between-beijing-and-washington.html

Both treasury and corporate bonds involve interest risks. However, these risks can be managed through the selection of bonds. It is important to note that bonds with small coupons involve more interest rate risk than bonds of similar maturity with larger coupons.

Symbol	CUSIP	Sector	Company	Rate	Expiration	Rating
B-MSFT-5.2-01062039	594918AD6	Technology	Microsoft Corp	5.20%	1 Jun 2039	AAA
B-AAL-8.057-02012022	023650AG9	Airlines	American Airlines	8.06%	1 Feb 2022	A+
B-PG-8.0-26102029	742718AV1	Consumer Staples	Procter & Gamble Co	8.00%	1 Oct 2029	AA-
B-WMT-6.5-15082037	931142CK7	Consumer Staples	Wal-Mart Stores Inc	6.50%	1 Aug 2037	AA
B-T-8.75-15052020	-	Treasury Bonds	T-NOTE	8.75%	15 May 2020	-
B-T-8.000-15112021	-	Treasury Bonds	T-NOTE	8.00%	15 Nov 2021	-
B-T-7.625-15112022	-	Treasury Bonds	T-NOTE	7.63%	15 Nov 2022	-

For treasury bonds, we have chosen three T-Notes with maturity dates in 2020, 2021 and 2022. Additionally, the T-Notes have high rates of 8.75%, 8.00% and 7.63%, and will be relatively less affected by interest rate risks.

For corporate bonds, we selected bonds with higher ratings, at least A. We also did a thorough research on each company, ensuring that we know what their company is about and their financial situation.

Credit Risk

With diversification into both corporate and treasury bonds, it is important to note the risks that come with these bonds. While treasury bonds are only affected by interest risks, corporate bonds are susceptible to credit risks as well. We will assess our corporate bonds' credit spreads to better understand the additional credit risks taken on by buying these bonds as compared to risk-free treasury bonds. Credit spread is calculated using the difference in yield of a treasury bond and a corporate bond of the same maturity and express in basis points, where a 1% difference is 100 basis points.

Corporate Bond	Current Yield	Treasury Bond	Current Yield[3]	Credit Spread
Microsoft Corporation 5.2% 06/39 30-year bond Rating: AAA	3.94%	US 30-Year Bond	2.36%	158 BPs
American Airlines 8.057% 01/22 22-year bond Rating: A+	7.75%	US 20-Year Bond	2.20%	555 BPs
Procter & Gamble Company 8% 10/29 40-year bond Rating: AA-	5.54%	US 30-Year Bond	2.36%	318 BPs
Walmart Inc. 6.5% 08/37 30-year bond Rating: AA	4.42%	US 30-Year Bond	2.36%	206 BPs

Given that treasury bonds are considered risk-free assets, we are able to diversify into corporate bonds that carry larger risk but might also offer higher profits if market confidence is rising. Of the four corporate bonds that we have chosen, Microsoft Corporation and Walmart Inc. are relatively low risk as seen by the lower credit spread, while Procter and Gamble Company carries moderate risk. The 22-year bond from American Airlines offer the highest coupon rate and current yield, but also carry a much higher credit risk with a credit spread of 555 basis points. This bond risk profile is consistent with our high-risk high-return trading strategy while managing the risks within an acceptable range.

3. Implication of Portfolio Moving Forward

As of 14 November, our portfolio has achieved a 0.12% return. We would consider it to have performed relatively well given that we are only 4 months into our 5 year investment horizon. In the previous months, our portfolio was not performing as well and we had to sell off certain stocks, and for some stocks holding on to them in believing that they their value would go up (AAPL), making the appropriate adjustments here and there.

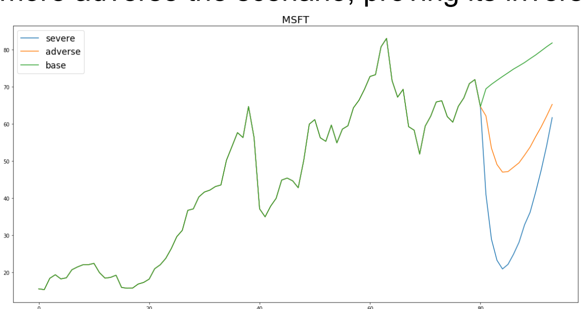
We believe that our current portfolio is relatively stable considering the risk management strategies taken. Moving forward, we expect events such as Trump's impeachment and the 2020 elections to have an impact on the US stock market. However, we believe our portfolio can withstand possible shocks arising from these events. Regardless, our team will constantly adapt and re-evaluate the portfolio, while reading up extensively on current affairs, and the US stock market especially.

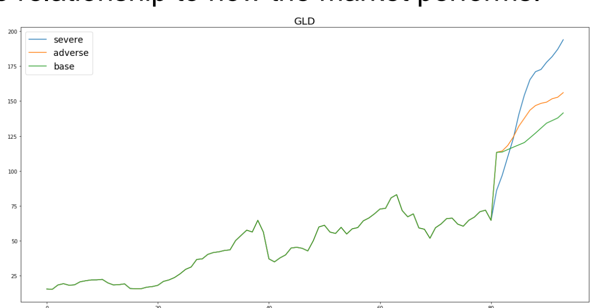
[3] Retrieved US Department of The Treasury (www.treasury.gov)

4. Stress Testing

For our stress testing, we used the historical data from the Federal Reserve to generate a linear regression trend with our stocks' performance. We also adopted the macro scenario tables from the Federal Reserve from 2019 Q1 till 2022 Q1 to simulate adverse and severely adverse scenarios based on multiple factors such as unemployment rate and real disposable income growth. We put our portfolio into simulated adverse and severely scenarios to predict how the portfolio would be affected by negative economic changes, benchmarked against their baseline scenario as well.

A trend can be seen when comparing our precious metal-backed equity's (GLD) simulated performance versus our other equities. GLD's simulated adjusted close rises significantly the more adverse the scenario, proving its inverse relationship to how the market performs.





Microsoft's simulated performance vs SPDR Gold Trust's simulated performance based on different scenarios.

We ran the stress test across all the equities in our portfolio to gauge how would our equities react in the event of an adverse and severely adverse scenarios. Through the graphs generated, we are able to predict the price movements of our stocks. By using this information, we could do a risk assessment in our asset allocation, whether our portfolio is largely susceptible to certain factors such as unemployment or housing index. From our results, we have concluded that our portfolio is relatively well-diversified to survive economic shocks.

5. General Reflections

Investment requires a well-thought out strategy with appropriate risk assessment strategies and asset allocation. Proper asset allocation and diversification has been a key role in our investment strategy. Throughout the span of 4 months, we have seen fluctuations to our portfolio and many a times our losses were minimized because we had diversification into different sectors, and asset classes.

Another key takeaway is to be disciplined, making the right decision and not simply following our emotions. One example would be AAPL stocks, where the prices were dropping right after we bought it. At times we were tempted to sell it to avoid further losses. However we were also aware that technology stocks are high growth stocks and sudden drops are likely to be short term. True enough, AAPL stock prices went up after a while, and today we have a 17.77% profit.

The value of GLD and SLV have been dropping in the past 4 months, however we have decided to keep it as we expect its prices to increase in the long term. Afterall, we are relying on gold and silver to hedge against adverse market conditions and inflation. This is another example of us making the right decisions, and not look out for short term gains only.

The stock market is often unpredictable, and no matter how we try to minimize our risks, we should be prepared to take on losses, at least in the short term. We should always be abreast of the happenings around the world, and consider the possible ways that the financial market will be affected our portfolio.

The initial exposure to stress testing has allowed us to realise that there are numerous ways to test our portfolio and we have to decide which method would be the optimum one to fully stretch the abilities of our portfolio. One example would be the stress test procedure that we carried out where selection of factors to stress test our portfolios is critical in determining the success of our stress test procedure for the portfolio. After spending a substantial amount of time on stress test, we also found other alternative methods that could boost the credibility of stress tests such as providing evidence on the effectiveness of the method and how certain factors are proven to affect the portfolio.

Overall, our team has gained a lot of valuable experience and knowledge through this project. We have learnt that it is difficult to delve into the investment industry with superficial knowledge. Thorough research and tests have to be done before we decide to set up a balanced portfolio that could potentially trudge through all the different types of risks out there before profiting with a sound trading strategy. This has definitely piqued our interest towards attaining knowledge to make sound decisions towards our financial investments.

6. Appendix

6.1 Bonds

Bonds are one of the asset classes we are using to help diversify our portfolio. Within the asset class itself, we have also diversified into different types of bonds, namely corporate and treasury bonds, as well as various sectors with regards to the corporate bonds.

Treasury bonds are considered "safe" instruments as they are backed by the United States government, and have near-zero risk of default. Corporate bonds, on the other hand, are loans taken by the issuing company, and carry larger default risk compared to treasury bonds, for example, if the company were to go bankrupt.

Symbol	CUSIP	Sector	Company	Rate	Expiration	Rating
B-MSFT-5.2-01062039	594918AD6	Technology	Microsoft Corp	5.20%	1 Jun 2039	AAA
B-AAL-8.057-02012022	023650AG9	Airlines	American Airlines	8.06%	1 Feb 2022	A+
B-PG-8.0-26102029	742718AV1	Consumer Staples	Procter & Gamble Co	8.00%	1 Oct 2029	AA-
B-WMT-6.5-15082037	931142CK7	Consumer Staples	Wal-Mart Stores Inc	6.50%	1 Aug 2037	AA
B-T-8.75-15052020	-	Treasury Bonds	T-NOTE	8.75%	15 May 2020	-
B-T-8.000-15112021	-	Treasury Bonds	T-NOTE	8.00%	15 Nov 2021	-
B-T-7.625-15112022	-	Treasury Bonds	T-NOTE	7.63%	15 Nov 2022	-

Corporate Bonds

1. **Microsoft Corporation 5.2% 06/39:**
   Symbol: B-MSFT-5.2-01062039
   Percentage of Fund invested: 5.55%
   Number of Holdings: 30
   Coupon Type and Frequency: Fixed, Semi-annual
2. **American Airlines 8.057% 01/22:**
   Symbol: B-AAL-8.057-02012022
   Percentage of Fund invested: 2.8%
   Number of Holdings: 20
   Coupon Type and Frequency: Fixed, Semi-annual
3. **Procter & Gamble Company 8% 10/29:**
   Symbol: B-PG-8.0-26102029
   Percentage of Fund invested: 3%
   Number of Holdings: 15
   Coupon Type and Frequency: Fixed, Semi-annual
4. **Walmart Inc. 6.5% 08/37:**
   Symbol: B-WMT-6.5-15082037
   Percentage of Fund invested: 3.1%
   Number of Holdings: 15
   Coupon Type and Frequency: Fixed, Semi-annual

Treasury Bonds

1. **T-NOTE 8.75% 05/20:**
   Percentage of Fund invested: 4.4%
   Number of Holdings: 30
   Coupon Type and Frequency: Fixed, Semi-annual
2. **T-NOTE 8.00% 11/21:**
   Percentage of Fund invested: 4%
   Number of Holdings: 25
   Coupon Type and Frequency: Fixed, Semi-annual
3. **T-NOTE 7.63% 11/22:**
   Percentage of Fund invested: 5%
   Number of Holdings: 30
   Coupon Type and Frequency: Fixed, Semi-annual

6.2 Equities

To diversify our portfolio, we bought stocks from various sectors and industries.

SECTOR | **INDUSTRY** Chart Performance

Sector Name	Last % Change 04:20 PM ET 09/27/2019	1 Day	5 Day	1 Month	3 Month	YTD	1 Year	3 Year	5 Year	10 Year
		09/27/2019								
Financials (.GSPF)	+0.24%	+0.24%	-0.20%	+6.77%	+3.92%	+17.71%	+0.29%	+47.07%	+48.39%	+137.13%
Energy (.GSPE)	0.00%	0.00%	-2.61%	+6.77%	-6.18%	+3.86%	-21.64%	-11.02%	-34.45%	+8.24%
Consumer Staples (.GSPS)	-0.08%	-0.08%	+1.21%	+1.30%	+5.03%	+20.03%	+12.91%	+15.39%	+34.66%	+140.52%
Materials (.GSPM)	-0.26%	-0.26%	-1.12%	+5.07%	-0.20%	+14.34%	-1.94%	+22.41%	+13.92%	+96.73%
Utilities (.GSPU)	-0.34%	-0.34%	+1.30%	+4.49%	+9.03%	+22.22%	+25.87%	+27.14%	+54.55%	+120.88%
Consumer Discretionary (.GSPD)	-0.37%	-0.37%	-0.93%	+1.47%	+0.18%	+20.20%	+0.54%	+50.05%	+75.61%	+342.82%
Industrials (.GSPI)	-0.41%	-0.41%	-0.44%	+5.64%	+1.35%	+20.54%	-0.76%	+31.40%	+42.13%	+183.36%
Health Care (.GSPA)	-0.42%	-0.42%	-3.01%	-0.13%	-2.62%	+3.29%	-5.37%	+23.76%	+38.67%	+212.52%
Real Estate (.GSPRE)	-0.78%	-0.78%	+0.16%	+1.09%	+7.82%	+26.44%	+22.23%	+18.71%	--	--
Communication Services (.GSPL)	-0.93%	-0.93%	-2.34%	+1.93%	+2.72%	+20.10%	+4.23%	-3.13%	+3.71%	+54.90%
Information Technology (.GSPT)	-1.28%	-1.28%	-0.82%	+2.11%	+2.34%	+28.53%	+6.83%	+77.03%	+112.26%	+321.83%
S&P 500 ® Index (.SPX)	-0.53%	-0.53%	-1.01%	+2.90%	+1.65%	+18.15%	+1.92%	+38.01%	+49.37%	+183.59%

Figure 1.1 - Sector Performance for past 1/3/5 Years (Fidelity)[4]

Figure 1.1 shows that the financial sector had the highest growth over a 5 year period. We selected various sectors that have performed well to invest in. Appendix 6.2.4 will show the growth of each stock purchased from the date bought till 15 November 2016

[4] https://eresearch.fidelity.com/eresearch/markets_sectors/sectors/si_performance.jhtml?tab=siperformance

6.2.1 Breakdown of Stocks Allocation

Sector (50% of total portfolio)	Allocation	Stocks/ETFs currently holding
Information Tech	20%	AAPL, TWTR, MSFT, BABA, QQQ(ETF)
Financial Banking	15%	VOYA, MFC, AFL**, JPM
Communication Services	5%	T, CMCSA
Energy	6%	BEP, TERP, XLE (ETF)[5]
Others (Blend)	4%	SPY (ETF containing blend of industries)

*Sold off Nintendo, as it is not in NASDAQ/NYSE stock market
**AFL was not bought in the end, as we could not find the right price to buy

6.2.2 Stock Selection

When choosing stocks, we looked at various factors such as beta, P/E ratio, VaR to decide on the stocks to buy. In addition, we do look at moving average and stocks having an upward price trend, when buying the stocks. Reading up on the happening of the companies gives us a heads up on likely fluctuations in prices. (I.E AAPL went up after the launch of the latest iPhone). We will also be making use of the Moving Average Convergence Divergence (MACD) to decide when to sell our stocks.

Stocks	Stock Exchange	Sector	Beta	PE Ratio	Earning Yield	95% VaR past 100 days, 18 Jun 2019 - 26 Sep 2019
AAPL	NASDAQ	Technology	1.08	18.75	0.0533	-2.14%
TWTR	NYSE		0.19	14.04	0.0712	-2.59%
MSFT	NASDAQ		0.97	27.54	0.0363	-2.95%
BABA	NYSE		1.87	47.4	0.0211	-3.08%
QQQ	NASDAQ		1.11	4.89	0.2045	-1.48%
VOYA	NYSE	Financial	1.51	15.37	0.0651	-2.54%
MFC	NYSE		1.46	19.85	0.0504	-1.94%
AFL	NYSE		0.51	12.47	0.0802	-2.25%
JPM	NYSE		1.19	11.47	0.0872	-2.20%
T	NYSE	Communications	0.76	15.77	0.0634	-1.60%
CMCSA	NASDAQ		0.99	17.51	0.0571	-1.97%
BEP	NYSE	Energy	0.68	89.06	0.0112	-0.94%

5

TERP	NASDAQ		0.14	-	-	-1.60%
XLE	NYSE		1.38	-	-	-1.61%
SPY	NYSE	Blend	1	-	-	-1.10%

NOTE: AFL stocks were not bought in the end as we could not find the right price to buy. Supposed to buy more T and CMCSA stocks as well to reach 5% allocation, but could not find the right price.

6.2.3 Moving Average Convergence Divergence (MACD) Indicator

When deciding on the right price to buy the specific stocks, we made use of the MACD indicator. Moving Average Convergence Divergence (MACD) is a trend-following momentum indicator that shows the relationship between two moving averages of a security's price[6]. The MACD is calculated by subtracting the 26-period Exponential Moving Average (EMA) from the 12-period EMA.

The relevant MACD charts for each stock are shown below as well. When the blue line is about to cross the orange line, the crossover indicates a new trend - an increasing trend. Charts by TRADINGVIEW. Most of our stocks would be bought at the time of crossover or sometime after the crossover that indicates an increasing trend. We have selected a few stocks to show its MACD chart

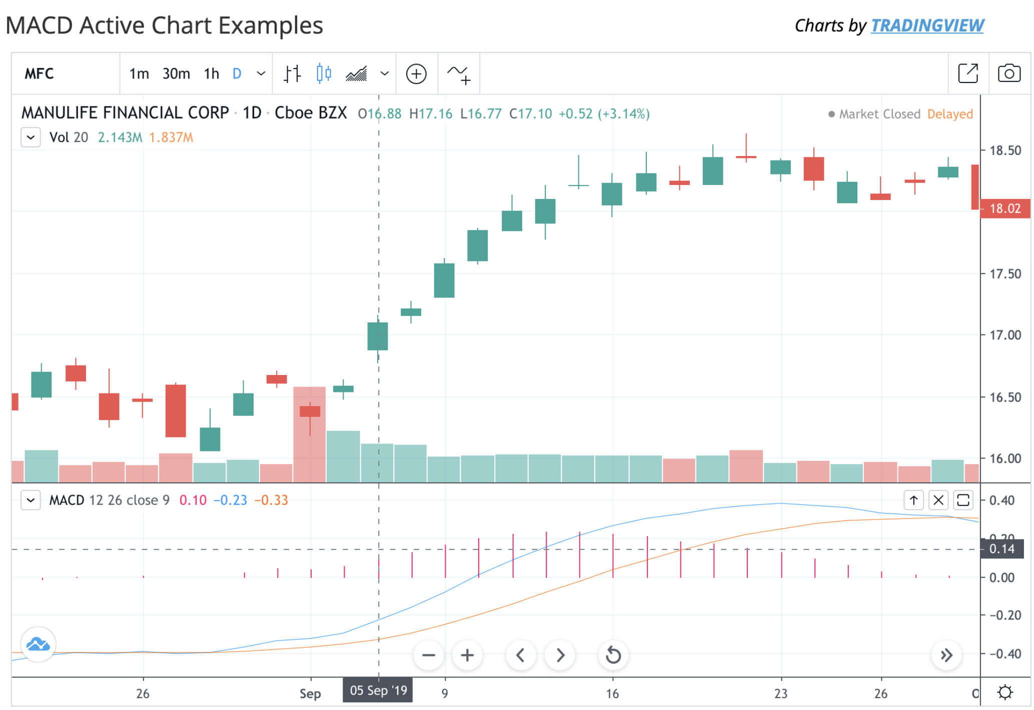


Figure 2.1 - MACD Active Chart for MFC (transaction date: 5 Sep '19 US Date)

[6] https://www.investopedia.com/terms/m/macd.asp

MACD Active Chart Examples

Charts by ***TRADINGVIEW***

Figure 2.2 - MACD Active Chart for VOYA (transaction date: 5 Sep '19 US Date)

MACD Active Chart Examples

Charts by ***TRADINGVIEW***

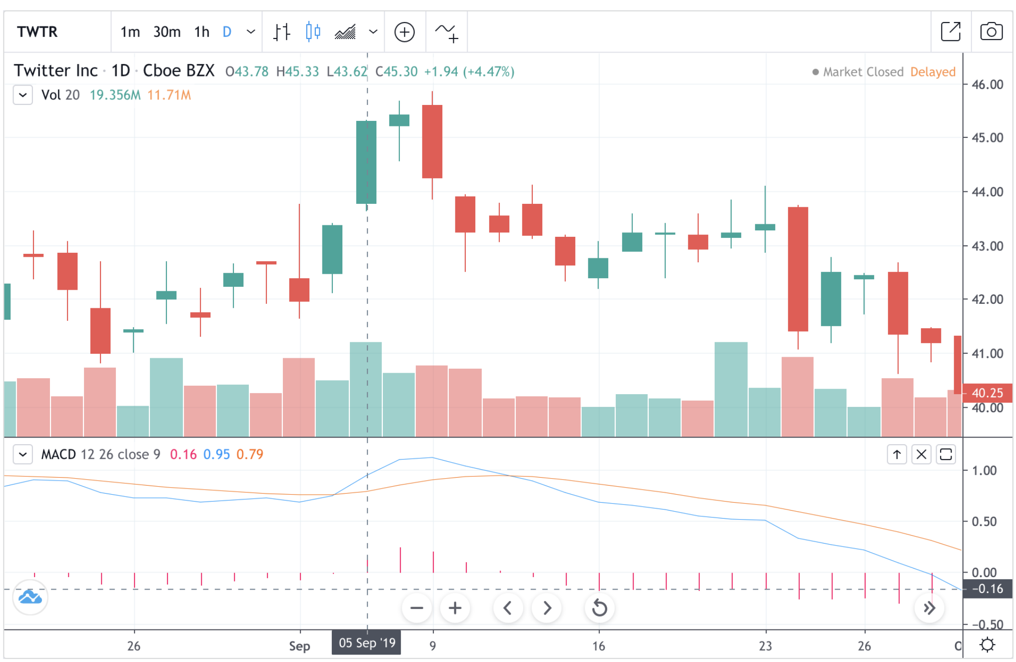


Figure 2.3 - MACD Active Chart for TWTR (transaction date: 5 Sep '19 US Date)

Figure 2.4 - MACD Active Chart for GLD (transaction date: 12 Sep '19 US Date)

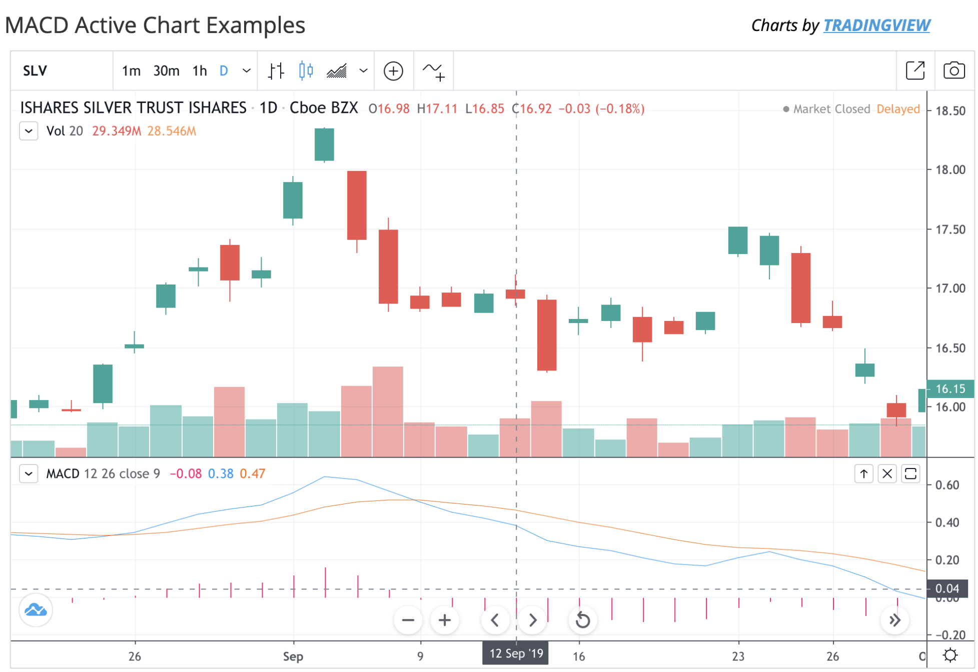


Figure 2.5 - MACD Active Chart for SLV (transaction date: 13 Sep '19)

Although GLD and SLV shows a downward trend, we still went ahead to purchase it as we wanted to have gold and silver on hand to hedge against the other US stocks we had, and to hedge against inflation. We believe that the price of GLD and SLV will increase in the long term.*)*

Figure 2.6 - MACD Active Chart for BABA (transaction date: 4 Oct '19)

6.2.4 Breakdown of ETFS containing stocks

We also bought some ETFs containing stocks, some covers many industries, and some are more specific.

1. **Invesco QQQ Shs(QQQ)**:

Percentage of Fund invested: 3.85%

Number of Holdings: 104

Type of ETF: Equity

- Asset Class:Equity
- Asset Class Size:Large-Cap
- Asset Class Style:Growth
- Sector (General):Technology
- Sector (Specific):Broad
- Region (General):North America
- Region (Specific):U.S.

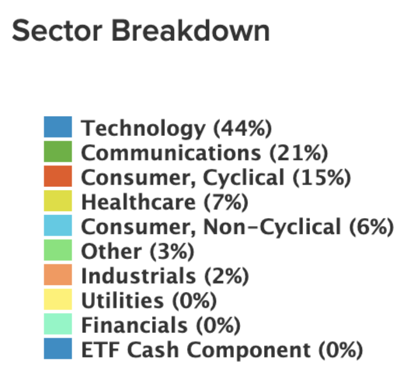


Figure 3.1 - Sector Breakdown of QQQ ETF

2. **SPDR S&P 500(SPY):**

Percentage of Fund invested: 4.53%

Number of Holdings: 505

Type of ETF: Equity

- Asset Class:Equity

- Asset Class Size:Large-Cap
- Asset Class Style:Blend
- Region (General):North America
- Region (Specific):U.S.

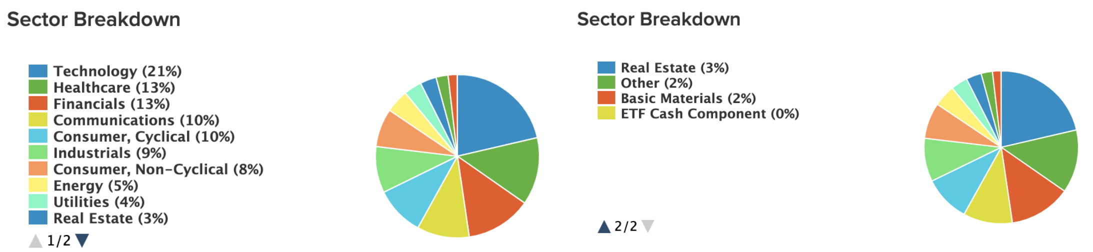


Figure 3.2 - Sector Breakdown of SPDR ETF

3. **ProShares Ultra Semiconductor(USD):**

Percentage of Fund invested: 3.82%
Number of Holdings: 31
Type of ETF: Equity

- Asset Class:Equity
- Asset Class Size:Large-Cap
- Asset Class Style:Blend
- Sector (General):Technology
- Sector (Specific):Semiconductors
- Region (General):North America
- Region (Specific):U.S.

4. **Energy Select Sector SPDR Fund ETF(XLE):**

Percentage of Fund invested: 9.89%
Number of Holdings: 29
Type of ETF: Equity

- Asset Class:Equity
- Asset Class Size:Large-Cap
- Asset Class Style:Blend
- Sector (General):Energy
- Sector (Specific):Oil & Gas Exploration & Production
- Region (General):North America
- Region (Specific):U.S.

6.2.5 Equity Performance

Symbol	Description	Sector	Quantity	LastPrice	PricePaid	ProfitLoss	Market Value	P/L %
AAPL	Apple Inc.	Technology	150	$ 265.76	$ 225.66	$ 8,188.22	$ 54,266.86	17.77%
BABA	Alibaba Group Holding Ltd - ADR	Technology	110	$ 185.49	$ 168.62	$ 2,526.16	$ 27,775.83	10%
MSFT	Microsoft Corporation	Technology	300	$ 149.97	$ 134.00	$ 6,521.99	$ 61,246.24	11.92%
QQQ	Invesco QQQ Shs	Technology	200	$ 202.91	$ 192.62	$ 2,801.56	$ 55,244.27	5.34%
TWTR	Twitter Inc	Technology	300	$ 29.25	$ 44.68	$ (6,301.46)	$ 11,945.41	-34.53%
MFC	Manulife Financial Corporation	Financial	1200	$ 19.87	$ 18.18	$ 2,768.88	$ 32,458.83	9.33%
VOYA	Voya Financial Inc	Financial	200	$ 57.92	$ 51.17	$ 1,837.75	$ 15,769.30	13.19%
JPM	JPMorgan Chase & Co.	Financial	200	$ 129.53	$ 120.70	$ 2,404.06	$ 35,265.83	7.32%
CMCSA	Comcast Corporation	Communications	400	$ 44.56	$ 47.02	$ (1,339.52)	$ 24,263.81	-5.23%
T	AT&T Inc.	Communications	500	$ 39.50	$ 36.22	$ 2,232.53	$ 26,885.67	9.06%
BEP	Brookfield Renewable Energy Partr	Energy	500	$ 44.82	$ 37.77	$ 4,798.58	$ 30,506.73	18.67%
TERP	TerraForm Power Inc - Ordinary Sh	Energy	1000	$ 15.60	$ 18.14	$ (3,457.70)	$ 21,236.28	-14%
XLE	Energy Select Sector SPDR	Energy	100	$ 60.08	$ 60.21	$ (17.70)	$ 8,178.69	-0.22%
SPY	SPDR S&P 500	Others (Blend)	150	$ 311.79	$ 301.85	$ 2,029.70	$ 63,665.95	3.29%
SLV	iShares Silver Trust	Silver	2500	$ 15.85	$ 16.91	$ (3,607.44)	$ 53,941.51	-6.27%
GLD	SPDR Gold Trust ETF	Gold	300	$ 138.21	$ 141.71	$ (1,429.36)	$ 56,443.58	-2.47%

Figure 4.1 - Profit Loss Percentage per Stock

With the exceptions of TWTR, TERP, GLD, SLV, XLE, most stocks are performing well.

6.3 Commodities

We are unable to purchase commodities directly from StockTrak, however we can gain access to commodities through ETFs.

These are the 2 ETFS for commodities bought

ETF	Allocation	Remarks
iShares Silver Trust(SLV)	5.85%	Number of Holdings: 1[7] Commodity Type: Precious Metals Commodity: Silver Exposure: Physically-Backed
SPDR Gold Trust ETF(GLD):	5.81%	Number of Holdings: 1 Commodity Type: Precious Metals Commodity: Gold Exposure: Physically-Backed

[7] https://etfdb.com/etfs/commodity-exposure/physically-backed/