TQQQ, SQQQ Leverage ETF Trading Strategy

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Abstract

After noting the rapid growth of the market over the past few years, the strategy was thought of to invest in the overall market index with 3x leveraged ETFS. Nasdaq 100 was noted to be the fastest-growing and most volatile index to perform the backtesting strategy. Using 3x leverage ETFs that track the Nasdaq 100 were chosen. TQQQ is a 3x leverage ETF based on the QQQ and SQQQ is a 3x inversed leveraged ETF that tracks the Nasdaq 100. Python and its various libraries were used to visualize the data after calculations were performed on the stock market data fetched from yFinance library. The outcome showed a "switch value" of 0.5 performed the best in the time frame chosen and it outperformed the growth of QQQ by 44.6%. At the end of the time frame using any other switch value using the strategy underperformed the growth of the initial investment of QQQ.

Method

The core strategy included observing the previous day's percent change in the Nasdaq and buying one of the leveraged ETFs depending on the value. If the value was less than the "switch value" then we would go with the trend and buy into the trend. However, if the absolute value was greater than the switch value then we would go in the opposite direction of the trend. For example, if the day before Nasdaq was up 0.45% and the "switch value" was 0.5% then we would buy TQQQ assuming our position with the trend. If it went up 2.85% and our switch value was 0.5% we would go opposite the direction for today's investment and buy SQQQ instead.

TQQQ, SQQQ Leverage ETF Trading Strategy

It is assumed that we start with an initial investment size of 10,000 dollars. Additionally, we buy at open and close the position at the end of the day. This means we only make the profit or loss on the intraday change. The intraday percent change was calculated as the following:

$$Intraday\ Percent\ Change\ = \frac{Close\ Price - Opening\ Price}{Opening\ Price}\ *\ 100$$

The closing balance for the account was then calculated by taking the previous day's balance and multiplying it by the intraday percent change to get today's closing balance. Changes in price from the day before close and today's opening were not considered leading to no loss or gain as we do not hold the stock overnight. This means movement in the market that happens when it is closed does not impact our overall value. Only intraday percent change was considered.

Note: No Commission fees were incorporated into the calculations (shoutout to WEALTHSIMPLE)

Results

Results were graphed with different switch values from a range of 0.5 to 2.5 inclusive incrementing at 0.5 each time. The date range was from 2018-01-01 to 2023-10-0, this range was chosen to reflect the short-term drop in December of 2018 and the COVID-19 pandemic bear market. The strategy was also applied to QQQ intraday change where the movement from the previous day was not checked but simply invested in the stock beginning of each day and sold at the end of the day. Additionally, the growth of a one-time investment of $10,000 into the QQQ at the beginning of the period chosen was also graphed. Findings showed that a switch value of 0.5

TQQQ, SQQQ Leverage ETF Trading Strategy

was able to outperform the singular one-time investment by 44.6% by the end of the date range.

The switch value of 0.5 also had rapid growth from 2021 to 2022 period causing the initial

investment to grow from $10,000 dollars to over $80,000 at its highest. This is an 8x growth or

over 700% increase from the initial value of our investment. During its peak, this strategy

outperformed the one-time investment strategy by over 300%. At times it can be noted that the

switch value of 0.5 loses to the other switch values but in the end, it beats the rest of the

investments as seen in the graph.

	date	Switch Value : 0.5	Switch Value : 1.0	Switch Value : 1.5	Switch Value : 2.0	Switch Value : 2.5	qqq_intraday	qqq_simple_investment
0	2018-01-02	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	NaN
1	2018-01-03	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10097.167554
2	2018-01-04	10061.255743	9942.056137	9942.056137	9942.056137	9942.056137	9983.185685	10114.832745
3	2018-01-05	10222.261922	10101.154814	10101.154814	10101.154814	10101.154814	10035.868469	10216.418098
4	2018-01-08	10109.929374	10214.811980	10214.811980	10214.811980	10214.811980	10074.916432	10256.167278
...	...	...	...	...	...	...	...	...
1441	2023-09-25	32969.543919	4530.759151	21017.690681	11366.798245	7960.141627	14436.325707	23587.683049
1442	2023-09-26	32203.896372	4425.541904	20529.599510	11102.828527	7775.284265	14323.905278	23233.484473
1443	2023-09-27	32102.131128	4411.557064	20464.725382	11118.750730	7786.434545	14310.201425	23287.927289
1444	2023-09-28	33175.626343	4559.079525	21149.065767	11490.561737	8046.812904	14467.808206	23482.736805
1445	2023-09-29	34093.003569	4439.431375	20594.031228	11189.004273	7835.632934	14336.951277	23499.789469

[1446 rows x 8 columns]

	date	Switch Value : 0.5	Switch Value : 1.0	Switch Value : 1.5	Switch Value : 2.0	Switch Value : 2.5
0	2018-01-02	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000
1	2018-01-03	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000
2	2018-01-04	10061.255743	9942.056137	9942.056137	9942.056137	9942.056137
3	2018-01-05	10222.261922	10101.154814	10101.154814	10101.154814	10101.154814
4	2018-01-08	10109.929374	10214.811980	10214.811980	10214.811980	10214.811980
...	...	...	...	...	...	...
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1445	2023-09-29	34093.003569	4439.431375	20594.031228	11189.004273	7835.632934

	date	nasdaq_pctChange_adjClose	tqqq_intraday	sqqq_intraday	qqq_intraday
0	2018-01-02	NaN	0.035060	-0.037718	0.012328
1	2018-01-03	0.836745	0.025131	-0.026057	0.008762
2	2018-01-04	0.175222	-0.005794	0.006126	-0.001681
3	2018-01-05	0.828633	0.016003	-0.015955	0.005277
4	2018-01-08	0.291878	0.011252	-0.010989	0.003891
...	...	...	...	...	...
1441	2023-09-25	0.450436	0.022373	-0.022760	0.007508
1442	2023-09-26	-1.565104	-0.023223	0.022287	-0.007787
1443	2023-09-27	0.223822	-0.003160	0.001434	-0.000957
1444	2023-09-28	0.828167	0.033440	-0.032136	0.011014
1445	2023-09-29	0.136654	-0.026244	0.027652	-0.009045

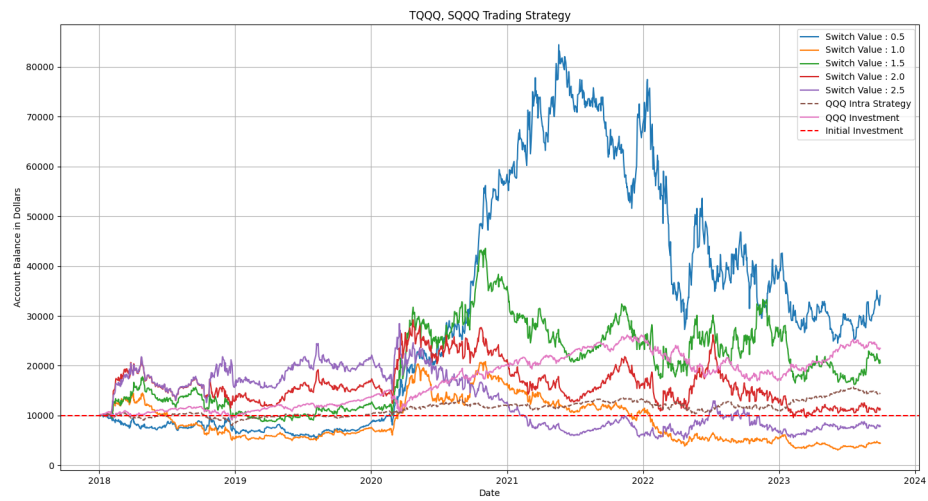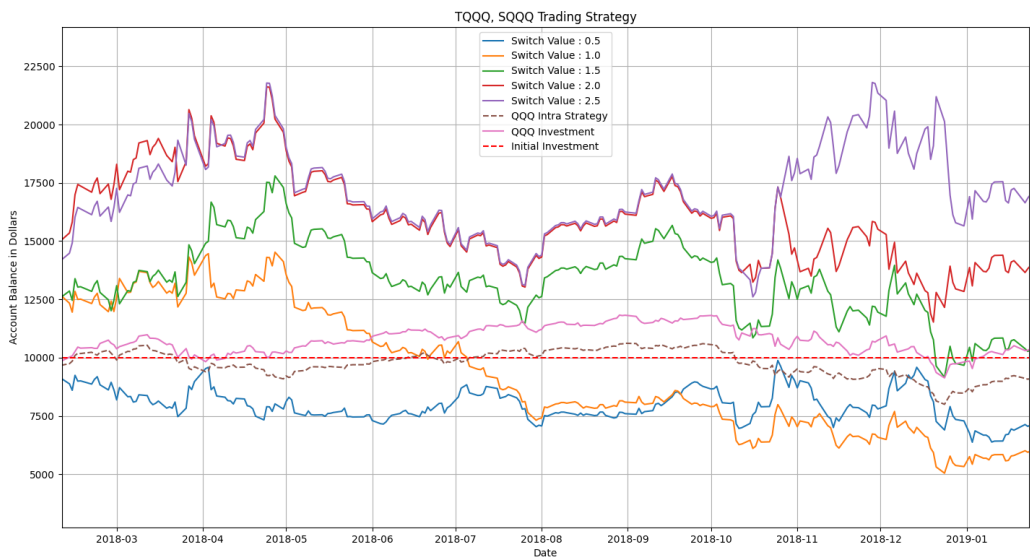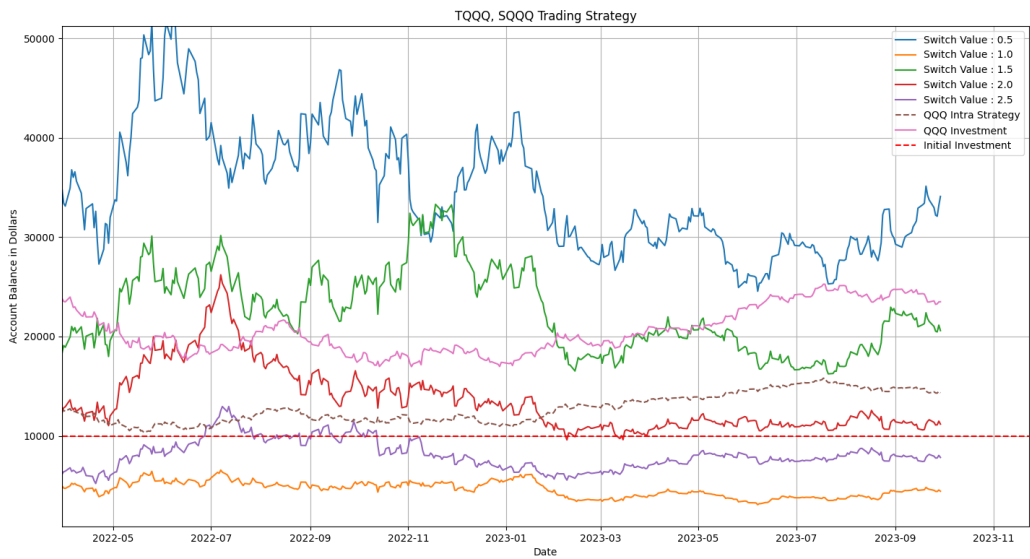# TQQQ, SQQQ Leverage ETF Trading Strategy

Figure: Growth of $10,000 using various strategies over a set timeframe

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