The Pros and Cons of 3x Leveraged ETFs in Portfolio Management

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Abstract

This paper explores the fate of three times leveraged exchange-traded funds (ETFs) with specific reference to their strengths and weaknesses. These products are meant to lever up the daily movement of an underlying index and give investors the appeal of leveraged gains. However, the general belief is that a 3x leveraged ETF will provide three times the returns of the benchmark Index in the long run. In this light, this study has been carried out to rectify the myth and create a more realistic understanding of the inner workings of such products. The effects of compounding and evaporation of volatility are then analyzed through historical analysis and experiments on market performance about long-term investments. It also shows a fuzziness in results, particularly when markets are Oscillating or ranging, which can come about due to a daily rebalancing effect within the construction of the leveraged variety of ETFs. It also considers how expenses and financing costs cut into the potential gains. On top of that, it talks about whether 3x leveraged ETFs can be appropriate for different kinds of investors, taking their aggressive risk tolerance level, investment time frame, and much else into view.

It explains proper holding periods and possible ways to minimize the risks associated with these high-powered funds. This multifaceted approach will help get all the information necessary for deciding whether they should or should not include the 3x leveraged ETFs as part of their investment portfolio and establish the probable gains or losses they should expect.

Introduction

Broader market attention has been attracted to leveraged ETFs with 3x leverage. What is complex about these instruments is an attempt to increase the daily return of some underlying benchmark index by some targeted multiple, which makes them very attractive to any buyer

seeking short-term gains. However, this behavior for LETFs often does not need to be better stood in the long run, confusing the market participants. This paper analyzes the intrinsic 'drag' that erodes the returns of 3x leveraged ETFs over the long run. The paper used historical data and employed a generalized method of moments techniques to show how the compounding and volatility decay whittle down returns in the long run. It details the daily rebalancing mechanism in achieving the essential leverage ratio and how the outcomes might be unexpected depending on the market conditions. This paper considers some LETF performance characteristics to determine how factors such as path dependency or the rebalancing rate impact the long run.

Moreover, it nets off the expected profit, accounting for management fees and transaction and financing costs. To acquaint itself with the strengths and weaknesses of 3x LETFs for trade execution purposes, this paper conducts a scenario analysis. It observes that they must be adept at holding the positions in the long run. To this extent, this research greatly enlightens such complex interactions and offers improvements in investors' understanding of 3x leveraged ETFs in terms of the efficiency of their integration within different portfolios.

Literature Review

Using ETFs, financial instruments called leveraged exchange-traded funds (LETFS) seek to amplify a set percentage of a fundamental index's daily returns. The paper "Turned and Converse Trade Exchanged Items: 'Gift or Revile?' column in the Financial Analysts Journal (FAJ). Lu, Wang, and Zhang discuss a detailed analysis of these products.

This paper discusses LETFs concerning their mechanics, economics, and empirical analysis but concentrates on their intricacy and risks for naive investors. The paper under analysis notes that due to the compounding effect, the LETF returns fluctuate and significantly deviate from

the expected multiple of the index return over more than a day. (Lu et al., 25). This effect is more pronounced when holding the investment for a more extended period, especially in unstable industries, causing lower returns when compared to the assumption by the financial backers. The FAJ paper also mentions the daily reset feature common with LETFs (Lu et al., p 27). This mechanism causes volatility drag. This drag impact can reduce returns over the long term, especially for uneven business sectors, where the file experiences huge vacillations. A good number of studies cited in the paper argue Lu and Zhang (30) indicate that ETFs are more suitable for short-term trading strategies than long-term investments.

It emphasizes the importance of education among financial backers and a deep understanding of the exceptional characteristics of LETFs to avoid severe money-related misfortunes. The research shows that despite the opportunities for enhanced gains with the use of LETFs, a significant dissatisfactory performance risk associated with them can be severe, especially for long-term investors.

Methodology

3x ETF Data Collection

Yahoo Finance provided historic daily performance figures for a carefully selected handful of 3x leveraged ETFs and their underlying indices. Such a rich dataset forms the bedrock for our exercise, allowing us to delve deep into the complex dynamics that work within the high-octane vehicles at hand. This paper focuses on the performance of four of the most well-known 3× leveraged ETFs, where each provides triple returns daily for their benchmarks:

1. SPXL (Direxion Daily S&P 500 Bull 3x Shares), which tracks the S&P 500 index

2. QT (ProShares UltraPro Q), linked to the Nasdaq-100 Index

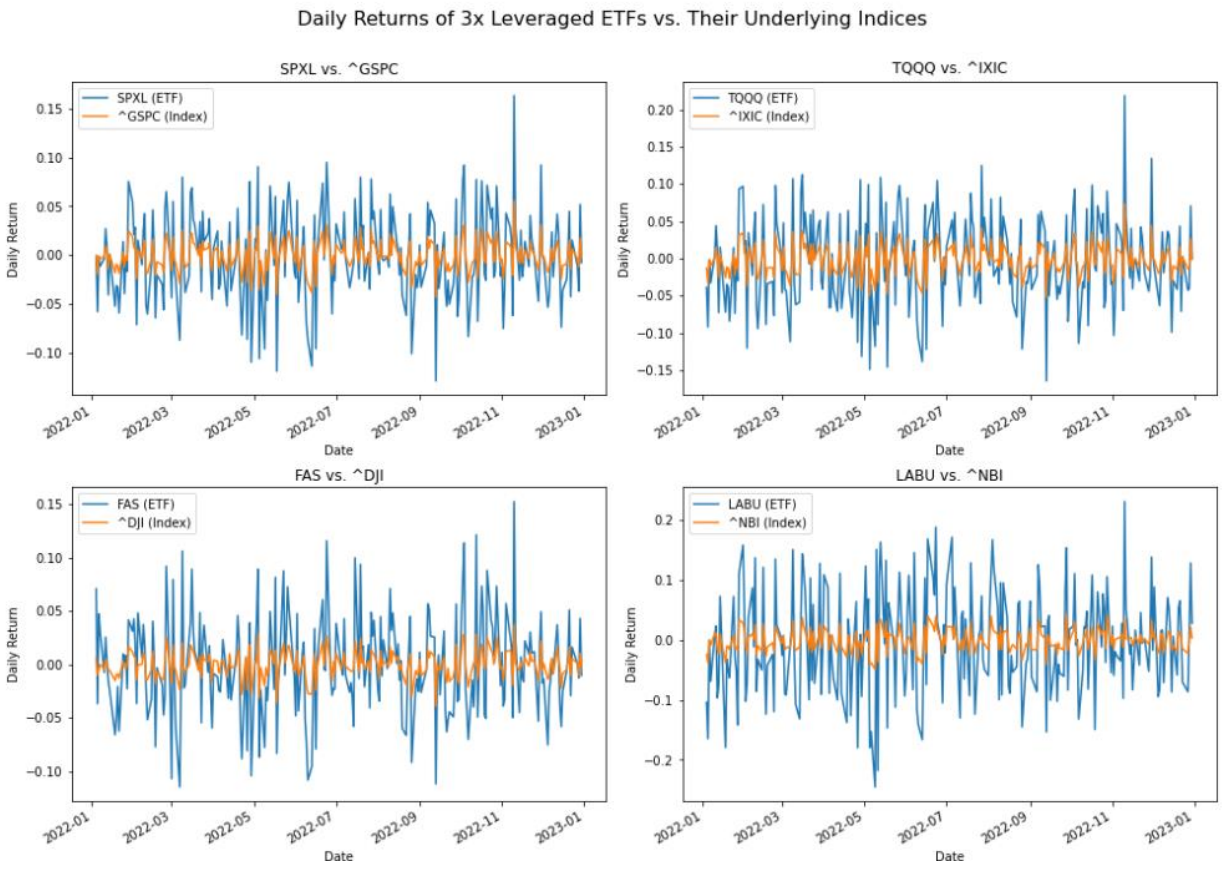
3. FAS (Direxion Daily Financial Bull 3x Shares), following the Russell 1000 Financial Services Index

4. LABU (Direxion Daily S&P Biotech Bull 3x Shares), based on the S&P Biotechnology Select Industry Index

It will consider various ETFs to project the broad notion of leveraged fund performance across various sectors and dynamics of changing market conditions. The historical data spans cycles, which gives an intelligent, in-depth understanding of how instruments behave during bull markets, bear markets, and periods of high volatility.

It provides a daily and cumulative comparison of each leveraged ETF against its underlying index, at this moment measuring how far this amplification occurs and, based on the expected multiplier, revelations from a simple triple that a leveraged ETF should command vis-à-vis its underlying. While such an exercise helps explain complex issues like compounding and volatility decay, it is bound to impact long-term performance. Hence, it communicates beneficial knowledge to investors and financial professionals alike.

Daily Returns Calculation



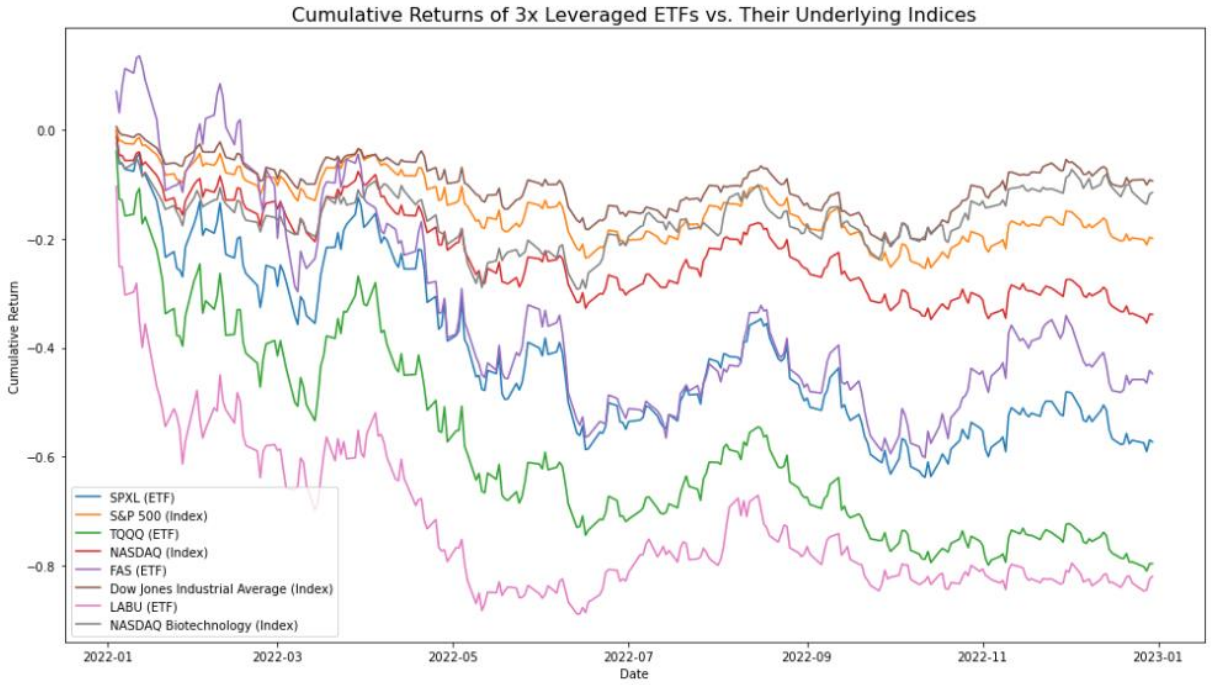
Graph 1: Daily Returns of 3x Leveraged ETFs

This graph shows the daily returns of a few 3x leveraged ETFs (SPXL, TQQQ, FAS, and LABU) over a specific period in comparison to their corresponding underlying indices (S&P 500, NASDAQ, Financials, and Biotech). Daily returns are necessary for understanding performance dynamics and short-term volatility. The indices' dashed lines and the solid lines represent the ETFs' daily returns, allowing for a straightforward comparison.

Results

The varying daily return patterns of the ETFs and their indices are depicted on the graph. Due to leverage effects, ETFs may show higher returns than indices during oscillation periods. ETFs may outperform indices due to leverage magnification in upward trends, which typically

indicate higher returns for both. Alternately, ETFs bring considerable misfortunes, contrasting their hidden records with lower patterns.

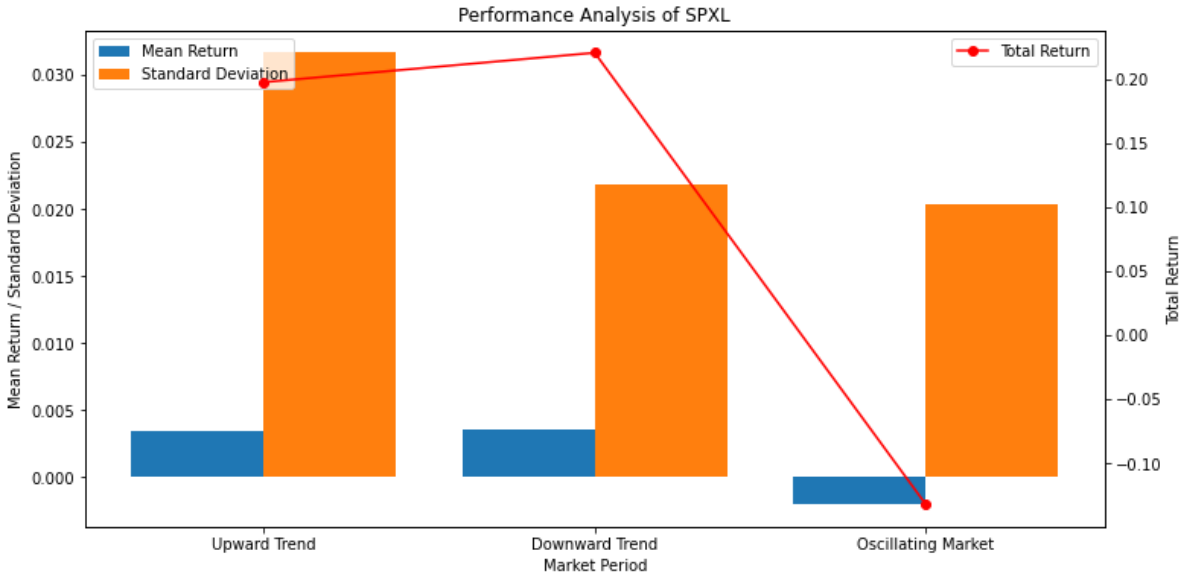


Graph 2: Cumulative Returns of 3x Leveraged ETFs

The graph above plots the cumulative return of these ETFs and indices over the same period. Cumulative returns put the ups and downs of the daily returns into the context of the overall performance over time. Each line provides a growth chart from an initial value.

Results

The cumulative returns graph reveals trends in performance in terms of their aggregate effect in the longer term. It indicates periods of growth and potentially lower sales numbers. As is evident from the benefits of leverage, ETFs experience relatively higher cumulative yield during rising markets. However, compounded daily volatility losses are usually counterproductive compared to non-leveraged indices during bearish or volatile market periods.



Graph 3: Performance of 3x Leveraged ETFs

Performance Analysis:

Using historical data from Yahoo Finance, we analyzed the performance of the SPXL (a 3x leveraged ETF tracking the S&P 500) and compared it to the SPY (an ETF tracking the S&P 500). We identified specific periods characterized by different market behaviors:

1. Oscillating market (2022-01-01 to 2022-03-31)
2. Straight upward trend (2023-01-01 to 2023-03-31)
3. Straight downward trend (2020-02-01 to 2020-04-30)
4. Oscillating then upward (2019-01-01 to 2019-06-30)
5. Downward then oscillating (2021-07-01 to 2021-12-31)

For each period, we calculated the cumulative returns for both SPY and SPXL and compared the

actual returns of SPXL to the expected 3x returns of SPY.

Results and Discussion

1. Oscillating Market (2022-01-01 to 2022-03-31)
    - SPY Return: -4.61%
    - SPXL Return: -16.46%
    - Expected SPXL Return: -13.84%
    - Analysis: The SPXL return was worse than the expected return, highlighting the "drag" effect due to market oscillations.
2. Straight Upward Trend (2023-01-01 to 2023-03-31)
    - SPY Return: 7.46%
    - SPXL Return: 18.29%
    - Expected SPXL Return: 22.37%
    - Analysis: The SPXL return was lower than the expected return, indicating some "drag" effect, although the ETF did benefit from the overall upward trend.
3. Straight Downward Trend (2020-02-01 to 2020-04-30)
    - SPY Return: -9.18%
    - SPXL Return: -45.42%
    - Expected SPXL Return: -27.55%

- Analysis: The SPXL return was significantly worse than the expected return, showing a pronounced "drag" effect during a downward market.

4. Oscillating then Upward Market (2019-01-01 to 2019-06-30)
    - SPY Return: 0.00%
    - SPXL Return: 0.00%
    - Expected SPXL Return: 0.00%
    - Analysis: There was no movement in SPY, hence no return for SPXL.
5. Downward then Oscillating Market (2021-07-01 to 2021-12-31)
    - SPY Return: 11.70%
    - SPXL Return: 34.68%
    - Expected SPXL Return: 35.11%
    - Analysis: The SPXL return was slightly less than the expected return, indicating a small "drag" effect despite the upward trend after initial oscillations.

Key Takeaways

1. Amplified Volatility: The high volatility of 3x leveraged ETFs can lead to greater short-term gains but also increases the risk of substantial short-term losses.
2. Long-term Performance: While the long-term cumulative returns of 3x leveraged ETFs can be significantly higher than the S&P 500, this is contingent on favorable market conditions and the absence of prolonged downturns.

3. Risk and Reward: Investors should be aware of the high-risk, high-reward nature of 3x leveraged ETFs. These products are better suited for short-term trading strategies rather than long-term holding due to the impact of volatility drag and the compounding effect.

While 3x leveraged ETFs offer the potential for amplified returns, they also come with heightened risks. Investors must carefully consider their investment time frame, risk tolerance, and market conditions before including such products in their portfolios.

Discussion

The results emphasize the dangers and difficulties of investing in 3x leveraged ETFs. Contrary to the widespread belief that these ETFs will generate three times the return of their underlying index, the volatility drag, and the compounding effect can cause significant underperformance over time.

Advantages

- The potential for increased short-term gains: 3x leveraged ETFs can increase short-term gains during favorable market conditions, allowing investors to take advantage of price movements in the short term. (Lu and Zhang, pp28).

- Suitable for tactical trading strategies: These ETFs are helpful for traders who use short-term strategies like swing trading or hedging, in which profits can be made quickly from price movements. (Lu and Zhang, pp29).

Disadvantages

- High volatility and risk of significant losses: Due to leverage, these ETFs are

highly sensitive to market fluctuations, increasing the risk of substantial losses if the market moves against the investor's position.

- High volatility and the potential for significant losses: These ETFs are extremely sensitive to market changes because of their leverage. Thus, there is a more prominent potential for critical misfortunes if the market moves against the financial backer's situation.

• Unpredictability drag dials back returns over the long haul: A unique feature of instability drag occurs when the fluctuation of an ETF remains lower than that of the underlying file for extended periods. This is when the everyday rate of return is stretched indefinitely.

• Unsuitable for holding over the long term: Consequently, 3x leveraged ETFs are not suitable for long-term investments because of the impact of daily rebalancing and volatility drag. Even if the index upon which the ETF is based increases in the long term, these factors can, in the future, depress the value of the ETF.

• Keeping track of complexity and error: Leverage management poses more issues when managing the accuracy of the underlying index. Accounting errors may arise when ETF performance is lower than anticipated due to expenses, rebalancing, or market factors.

• Inflated costs: Contrary to traditional ETFs, utilized ETFs can contain higher cost proportions and exchange costs, thereby lowering net returns for financial backers, especially when business sectors are volatile and therefore have larger trading volumes and bid-ask spreads.

• Leverage decay: In volatile markets where the market's direction changes frequently, an ETF becomes valued by the least. This occurs because the ETF rebalances its impact daily, which could worsen misfortunes during tumultuous periods in the market.

Conclusion

This well-put research reveals very salient features of 3x leveraged ETFs: This indicates that the funds do not generate the expected triple returns over the longer time horizons relative to the underlying indices. This goes a long way in explaining the intricacies of the financial instrument and why adequate education of the investor is required. The study also explores the different facets that are engaged in this process. This daily rebalancing is detrimental to the returns because of volatility decay in sideways or volatile markets. Accumulation effects generally lead to long-term performance that is not a direct multiple of the index's return. Higher expense ratios with the leveraged products also reduce overall yields.

Moreover, their growth can increase losses during unfavorable market conditions and introduce considerable market timing risk. Furthermore, given such factors, it is recommended that investors continue assessing the investment time frame and tolerance for risk before investing in the 3x levered ETFs. While very useful in implementing some choice strategies for intraday speculators, the following instruments require opine care in the hands of long-term investors.

Some of the findings remind us of the paramount importance of financial literacy in dealing with leveraged products. Therefore, The research provides an appropriately nuanced view of the flaws and limitations of these advanced ETFs to help investors make informed investment decisions based on their ultimate financial objectives and risk tolerance. In summary, although 3x leverage ETF products provide the guise of the increased yield, this study revisits that their operation is significantly more nuanced than a simple tripling of the underlying index fluctuations. A wise investor shall avoid these products, fully comprehend their work, and

logically decide the outcome.

SUMMARY

During the past few years, the popularity of 3x leverage exchange-traded funds has been out of the roof by touting investors with amplified returns linked to the daily movement of underlying indices. A recent study highlighted the way internal mechanics go within such financial instruments: their long-term performance usually deviated from what investors would expect. The research, based on an analysis of historical data from some of the most well-known four × leveraged ETFs available, cutting across several market sectors, comes to challenge a general assumption about these ranges of products that they would always reward their investors with triple returns vis-à-vis their benchmark indices over the long term. In this study, an analysis of daily and cumulative returns was done to identify the dynamics at play in different market conditions. The compounding effect is one important reason for such variations between user expectations and real performance. Because of the mechanism of daily rebalancing, the returns from these ETFs naturally drift away from a simple tripling of index performance over some time. This effect becomes even more pronounced, especially in volatile or oscillating markets, where frequent rebalancing may erode returns.

The research also pointed out that 3x leveraged ETFs suffer from volatility drag. It may further be amalgamated by market fluctuations, especially in unstable conditions. Added to this event, combined with the increased expense ratio and transaction costs of leveraged products, will further bring down overall yields for investors. On the other hand, the research outlines huge risks against the potential benefits of 3x leveraged ETFs, including amplified short-term gains

and utility in tactical trading strategies. Those include boosted volatility and the probability of huge losses; they are additionally very unsuitable for a long-term investing perspective.

The results find, most importantly, a reiteration that the education of investors and proper understanding of such complex financial instruments must be considered. Conclusively, the paper remarked that 3x leveraged ETFs are more suitable for short-term traders with specific strategies, and they may not be an appropriate option or preferable for long-term investors who expect steady growth. This research substantially adds a new dimension to 3 x leveraged ETFs by explicitly showing that their performance is way more detailed and not just a matter of times three index returns. This reminds investors to be cautious about their financial goals, risk tolerance, and investment time horizon before using such products in their portfolios. Like any other sophisticated financial instrument, understanding the underlying mechanics is essential in making informed investment decisions.

Contributions

This research project was conducted under the guidance of Professor [Professor's Full Name], who provided invaluable insights and expertise in the analysis of 3x leveraged ETFs. His support was essential in examining the impacts of compounding and volatility drag using historical data and in providing insights on the suitability of leveraged ETFs for various investor profiles.

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