

Harvest Patterns: A Retrospective on Tax Loss Harvesting Efficacy

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A Brief History

Tax Loss Harvesting (TLH) has existed for as long as capital gains have been taxed. In its earliest form, investors would sell losing positions at year-end to offset realized gains, reducing their tax burden. Needing to avoid the IRS's wash-sale rule, which disallows losses if a substantially identical security is repurchased within 30 days, made early TLH a cumbersome manual process, typically limited to wealthy tax-savvy investors.

Over time, TLH became more proactive. Rather than waiting until December, investors began harvesting losses throughout the year, anticipating gains either in the current tax year or future years. This shift acknowledged that tax losses can carry forward and have long-term value. Still, the process remained complex, requiring careful tracking of what to sell and how to reinvest without violating wash-sale rules.

The rise of passive investing helped simplify TLH. Investors could sell mutual funds or ETFs at a loss and reinvest in similar—but not identical—alternatives. Technology accelerated this trend, and by the 2010s, automated TLH systems were monitoring ETF portfolios daily. While **ETF-based TLH** can generate significant benefits during market downturns, it's far less effective in rising markets.

A more powerful approach emerged with **direct indexing**, pioneered by Seattle-based Parametric Portfolio Associates. Instead of using ETFs, investors own custom portfolios of individual stocks designed to track a benchmark index. This offers many more opportunities for TLH because individual stock losses are more frequent than broad index declines. Even in bull markets, some stocks still fall, making it possible to harvest losses without a bear market.

However, direct indexing becomes less effective over time. As remaining positions accumulate gains, fewer holdings dip below their purchase price, reducing TLH opportunities.

The latest evolution comes from Greenwich-based AQR Capital Management, which introduced **tax-aware long-short (TALS)** investing. This strategy can be thought of as adding balanced long and short positions to a direct indexing portfolio. Long positions tend to generate losses in bear markets; short positions in bull markets - providing a larger, more consistent stream of tax losses over time. This diversification helps sustain TLH even as the overall market rises.

Because short positions reduce net market exposure (and expected return), AQR balances them by adding incremental long positions. This keeps the portfolio's market exposure intact while further expanding the pool of TLH candidates. Every position - long or short -has potential to generate future tax benefits.

Each TLH method involves trade-offs. ETF-based TLH offers the lowest cost and risk but more limited tax benefits. Direct indexing provides greater tax savings with higher complexity and cost. TALS investing offers the most robust tax benefits, with the benefits, along with costs and risk, depending on how aggressively the strategy is implemented and how successful the underlying algorithm is at producing above market returns along with the tax benefits.

Summary of Different TLH Approaches

	ETF-BASED TLH	DIRECT INDEXING	LONG-SHORT TAX-AWARE
Effective TLH Horizon	Short-Term	Short-Term	Long-Term
Ideal Market Conditions	Bear Market Volatile Market	Bear Market Volatile Market	Bull or Bear Market Volatile Market
Risks	Minimal	Minimal	Minimal to Low (depends on leverage)
Incremental Costs*	Minimal	Low	Varies

*Estimated incremental cost of implementing strategies:
ETF-based TLH - ~ zero, Direct Indexing - ~ 0.35%
Conservative TALS (AQR) ~ 0.6% Aggressive TALS (AQR) - ~ 2.85%

How Effective are the Different TLH Approaches?

Evaluation Method

TLH makes sense for all investors - and which approach to use depends on the relative tax benefits available in an individual investor's situation. Here we evaluate the different tax benefits available over the past year (May 2024 through April 2025) using consistent naïve models for TLH applied to the S&P 500 index.

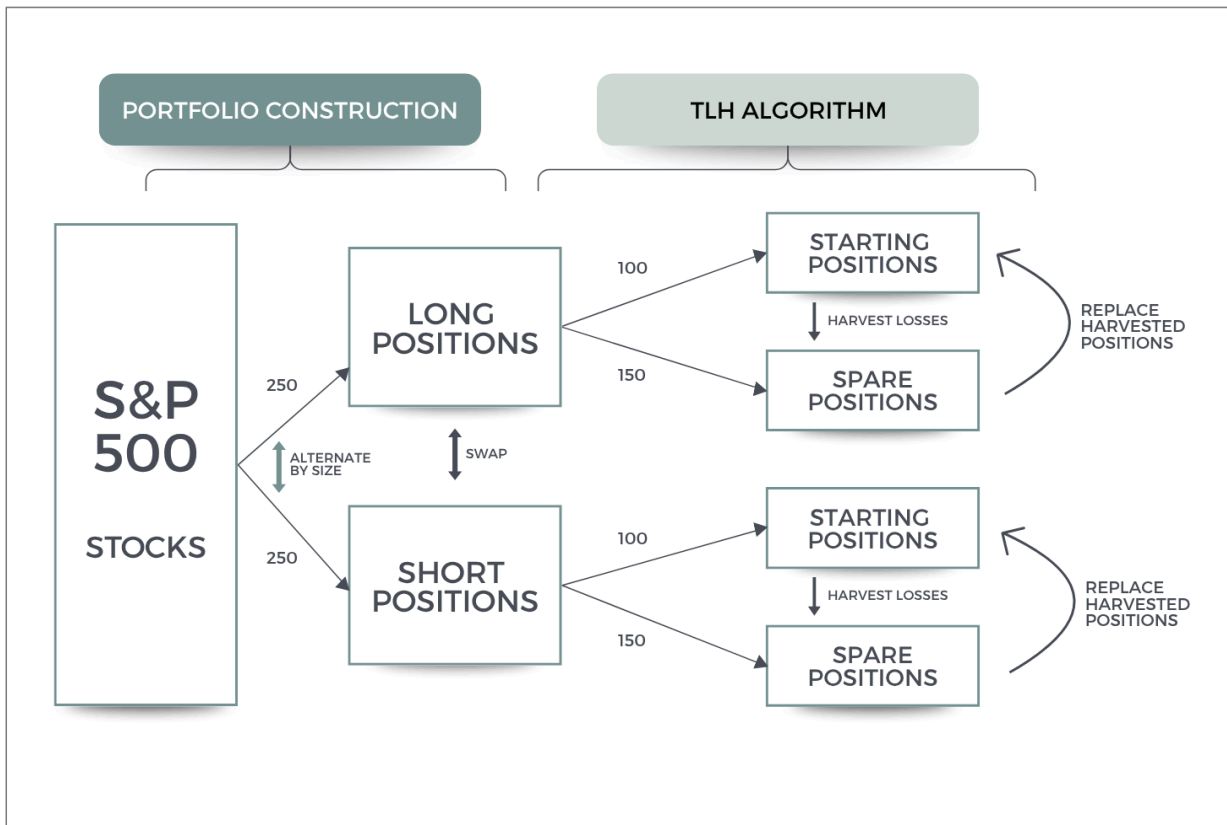
For ETF-based TLH:

- **Stock Selection:** We use the SPY ETF.
- **Portfolio Construction:** We form a \$1 million portfolio consisting entirely of SPY.
- **Loss Harvesting Rule:** We monitor daily closing price. If SPY falls more than 3% relative to original cost, the loss is harvested by selling the entire portfolio at close, with the proceeds immediately reinvested into SPY (ignoring the wash rule).
- **Trial Design:** We do this for the entire 12-month period as well as for each of the 12 individual months.

For Direct Indexing:

- **Stock Selection:** From the S&P 500 constituents as of 12/31/2024 we create two distinct 250-stock Long and Short groups by alternating market capitalization ranks (e.g., #1 largest to Long, #2 to Short, #3 to Long, etc.). So based on this, Microsoft, NVIDIA, and Amazon are assigned to the Long group while Apple, Alphabet (Google), and Meta (Facebook) are in the Short group. To increase randomness, we also reverse the assignments (Microsoft short; Apple long, etc.) and average the results.

- Portfolio Construction:** From each group of 250 longs, we randomly select 100 stocks to create a \$1M starting portfolio (equally-weighted), holding the other 150 stocks as spares to replace securities that are sold to harvest losses. These same groups are used for evaluating tax-aware long-short investing. The process is diagrammed below:



- Loss Harvesting Algorithm:** Positions are monitored daily based on closing price. If a long falls more than 3% below original cost, the loss is harvested at close, and the stock is replaced with the spare of the most similar market cap.
- Trial Design:** We do this for the entire 12-month period as well as for each of the 12 individual months. For each month, we run trials using 60 different random starting groups of 100, a total of 120/month including the long/short reversal of each group. For each month the results average these 120 trials.

For TALS:

- **Stock Selection:** From the S&P 500 constituents as of 12/31/2024 we create two distinct 250-stock Long and Short groups by alternating market capitalization ranks (e.g., #1 largest to Long, #2 to Short, #3 to Long, etc.). So based on this, Microsoft, NVIDIA, and Amazon are assigned to the Long group while Apple, Alphabet (Google), and Meta (Facebook) are in the Short group. To increase randomness, we also reverse the assignments (Microsoft short; Apple long, etc.) and average the results.
- **Portfolio Construction:** From each group of 250, we randomly select 100 stocks for the starting portfolio, \$1.5 million long and \$0.5 million short – for the same \$1 million net market exposure. We reserve the other 150 stocks from each group as spares to replace securities whose losses are harvested. These same long-stock groups are used for evaluating direct indexing - the TALS portfolio is the direct indexing long portfolio expanded 1.5x plus a distinct 0.5x short portfolio.
- **Loss Harvesting Rule:** Positions are monitored daily based on closing price. If a long falls or a short rises by more than 3% (relative to original cost), then the loss is harvested at close, and the stock is replaced with the spare of the most similar market cap.
- **Trial Design:** We do this for the entire 12-month period as well as for each of the 12 individual months. For each month, we run trials using 60 different random starting groups of 100, a total of 120/month including the long/short reversal of each group. For each month the results average these 120 trials.

By using multiple trials of (mostly) randomly selected stocks, **our approach isolates potential TLH**. The portfolios are naïve and symmetric; the results reflect mechanical TLH only.

Results

Average One-Month TLH for the three algorithms

MONTH	ETF-BASED TLH	DIRECT INDEXING	LONG-SHORT TAX-AWARE
MAY 2024	0	\$23,902	\$65,146
JUNE 2024	0	\$33,450	\$62,310
JULY 2024	0	\$25,613	\$73,053
AUGUST 2024	\$32,516	\$53,845	\$100,034
SEPTEMBER 2024	\$41,371	\$35,981	\$72,157
OCTOBER 2024	0	\$42,609	\$83,157
NOVEMBER 2024	0	\$22,218	\$74,748
DECEMBER 2024	0	\$76,043	\$121,087
JANUARY 2025	0	\$25,290	\$70,488
FEBRUARY 2025	0	\$44,755	\$87,441
MARCH 2025	\$71,965	\$71,103	\$117,628
APRIL 2025	\$96,730	\$124,039	\$195,845
AVERAGE	\$20,215	\$48,237	\$93,591

The three TLH algorithms apply each strategy's rules month by month over this 12-month period, an interval that reflects relatively varied market environments. The S&P 500 returned 11.9% during the year, with a mix of rising (e.g., May and November 2024 each up over 5%) and falling (e.g., March 2025 down over 5%) months, as well as periods of calm (May and June 2024) and volatility (August 2024, March and especially April 2025).

We expect the direct indexing algorithm to generally harvest more losses than the ETF-based algorithm, which requires the broad market to show a loss rather than an individual stock.

Similarly, the TALS algorithm is mechanically guaranteed to harvest at least 50% more losses than the direct indexing algorithm because it takes the direct indexing algorithm's portfolio, expands it by 50% and then adds a distinct short portfolio (to cancel out the additional market risk). The TALS algorithm harvests all the losses of the direct indexing algorithm plus the additional losses in the long-short expansion.

This study's purpose is to empirically document the relative TLH each algorithm accomplishes over these 12 months by systematically following rules aligned with each TLH strategy. We make no claims about the future - and we note the diversity of market conditions across the 12 months. This diversity allows us to explore the market conditions associated with better TLH results .

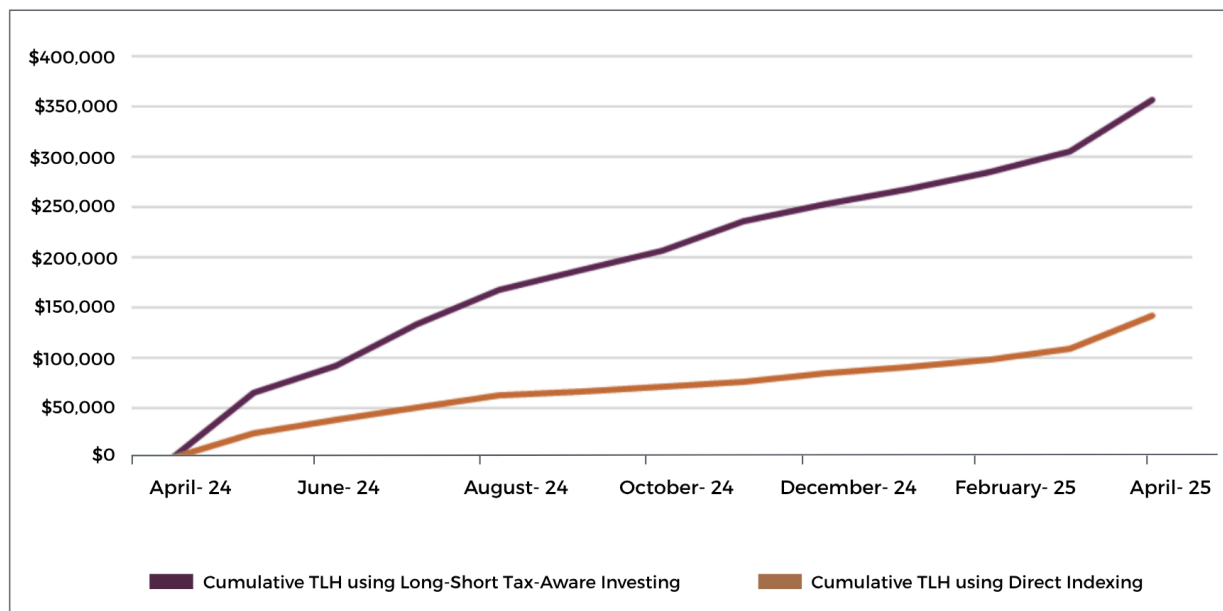
On average in the initial month, the direct indexing algorithm harvests tax losses approximately 2.5 times greater than ETF-based TLH, but only half as large as those harvested by the TALS algorithm. All three TLH algorithms do better in the five months the market falls than the seven when it rises - with ETF-based averaging 3.2x as many losses, direct indexing 2.3x as many, and TALS 1.6x.

All three TLH algorithms also harvest their most losses in April 2025 when market volatility explodes (April volatility is almost quadruple the average over the other 11 months and over 2.5x the next highest month, March). The TLH

difference is similarly dramatic: in April the ETF-based algorithm harvests 4.8x its average first-month losses, direct indexing 2.6x as many, and TALS 2.1x. Based on these 12 months, TLH may offer investors a significant silver lining during troubled market times.

The Full 12-Month Period

Because our test period begins with a strong bull market (S&P 500 up 15% after five months and over 20% after seven), the ETF-based TLH algorithm yields zero harvestable losses when applied to the full 12-month period. This result should not be generalized because it is simply a matter of timing - had the evaluation begun in March 2025, when market volatility was higher, ETF-based TLH would have delivered meaningful results. Given no losses harvested by the ETF-based TLH algorithm over the year in question, in the Figure below we report cumulative 12-month results for the direct indexing and TALS algorithms only.



Over these 12 months (May 2024 to April 2025) cumulative harvested losses total \$142,253 from the direct indexing algorithm and \$356,691 from TALS.

An interesting feature of the TALS algorithm is that it can be scaled up or down by assuming the strategy expands the direct indexing portfolio by more or less. For example, applying the TALS algorithm aggressively, adding \$2m each long and short to the base \$1m portfolio (instead of \$500k), leads to the algorithm harvesting over \$1m of losses in 12 months.

Outlook going forward

What might we expect from the TLH algorithms in the second year? After 12 months of systematically harvesting >3% losses while deferring gains, we expect that many remaining positions will have large unrealized gains - limiting the pool of positions likely to trigger additional loss harvesting.

You can think of this as: at launch the TLH algorithms are fishing in fertile waters (all positions, long and short, start flat, making all within 3% of a harvestable loss). As time passes many of the fish (losses) are already in the boat, leaving fewer in the water. While additional results are still possible, the catch (TLH) likely becomes increasingly skimpy.

The individual stocks' loss/gain distribution within each portfolio entering the second year is a way to quantify this situation. Positions that enter close to flat (small loss or gain) are better positioned to provide a harvestable loss than positions that enter at a larger gain (all large losses have already been harvested).

As we can see in the Table below, the first-year harvesting has depleted promising TLH opportunities - over half of remaining long positions in the portfolio enter the second year with extreme unrealized gains (more than 20% above original cost), and nearly 80% have 10%+ gains.

These high-gain positions are unlikely to provide harvestable losses going forward. Most of the remaining short positions also have large unrealized gains, however, a much larger minority - over 20% - enter the second year at a loss or a small gain.

Short positions comprise over 90% of the positions entering the second year at a loss and two-thirds of the positions entering at a small gain. This suggests that the TALS algorithm may be better positioned to continue to harvest further losses in the second year.

Distribution of Remaining Positions' Unrealized Gains/Losses After One Year

ENTER THE SECOND YEAR AT A	LOSS (<3%)	SMALL GAIN (<5%)	MEDIUM GAIN (5-10%)	LARGE GAIN (10-20%)	EXTREME GAIN (>20%)
Long Positions	0.6%	6.7%	15.0%	27.1%	50.6%
Short Positions	5.8%	14.9%	17.5%	28.8%	33.2%

Limits of this study

This study reports the TLH achieved by three TLH algorithms for the 12 months May 2024 to April 2025. The TLH algorithms are designed to capture the basic features of three popular TLH strategies, ETF-based TLH, direct indexing, and TALS investing. While our results are interesting and useful, there are some important limitations:

- This is a retrospective on a single 12 month period. The results for different 12 month periods would vary. In particular, the ETF-based TLH algorithm harvesting zero cumulative losses during this year is clearly a result of the 12-months starting with a strong bull market.
- Within these 12 months, the relative TLH done by the three algorithms varies noticeably depending on market conditions. This suggests that our results could be biased by any unrepresentative conditions during the year studied.
- The algorithms harvest losses at market close based on the closing price, which isn't known before close.
- The study evaluates the losses harvested by the TLH algorithms without measuring or incorporating any corresponding 1) costs of implementing the algorithm including any financing costs or management fees or 2) risk introduced by the TLH strategy. That is, the study quantifies the benefits of the three algorithms but not the costs or risk.¹
- In practice, more aggressive implementations of the TALS algorithm can be expected to be higher cost and risk.

Because of these limitations, the study only captures the potential benefits of the different TLH approaches, not the net benefits including costs.

Depending on their situation and the relative costs and risks, an investor could be better served by a TLH strategy that expects to harvest fewer losses, or possibly no TLH strategy at all.

¹ In practice, the annual costs of implementing these strategies are 1) essentially zero for ETF-based TLH, 2) 0.35% for direct indexing (Schwab), 3) 0.6% for conservative TALS (AQR), and 4) 2.85% for aggressive TALS (AQR). The TALS estimates include both the cost of leverage and management fee.

Conclusion

The evolution of tax loss harvesting has created powerful tax-mitigation tools for affluent, tax-sensitive investors. This study uses consistent TLH algorithms to evaluate three distinct approaches: ETF-based TLH, direct indexing, and TALS investing.

Our results suggest that all three can be expected to provide immediate value for tax-sensitive investors, but the more sophisticated strategies produce better loss harvesting results. Over the year evaluated, the direct indexing algorithm provides roughly 2.5x the first-month tax benefits of the ETF-based TLH algorithm, while the TALS investing algorithm delivers an additional 2x the harvested losses compared to the direct indexing algorithm.

Over the full 12 months the direct indexing algorithm harvests \$142k of tax losses - while deferring all of the offsetting gains (the market is up over these 12 months).

A conservative implementation of the TALS algorithm, borrowing \$500k to expand the long portfolio along with shorting \$500k to offset the increased market exposure and provide losses in up markets, harvests \$357k of tax losses. A very aggressive implementation borrowing and shorting \$2m harvests \$1m of tax losses.

Regardless of the TLH approach that best fits any individual's situation and goals, we believe that our TLH retrospective makes one thing clear: tax sensitive investors may want to consider a thoughtful TLH strategy that turns market drops and volatility into valuable tax benefits.

To schedule a complimentary conversation about how Ultra Tax Efficient Wealth ManagementSM can help you minimize your tax bill and enjoy more wealth over your lifetime, please [click here to schedule](#) a call with our advisory team today.

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