

Tax-loss Harvesting Replacement Algorithm

The New Way To Tax Loss Harvest

Tax-loss harvesting is often presented as a mechanical exercise: realize capital losses, reinvest into a replacement security, wait out the wash-sale window, and buy back into the model. In practice, the reinvestment step is where most of the economic risk resides—and where simplistic approaches erode value.

The Core Problem

When a position is sold to realize a capital loss, the portfolio temporarily loses exposure to a very specific combination of risks characteristics. The most used replacement is a broad-based ETF. Clients implicitly assume that these ETFs have a “similar exposure” and adequately capture at a high level (e.g., same sector, same asset class). That assumption rarely holds.

A single stock—or even a concentrated sleeve—typically embeds a distinct mix of exposures:

- Market beta
- Sector and sub-industry sensitivity
- Style factors (value, growth, momentum, quality)
- Volatility regime behavior
- Correlation structure with the rest of the portfolio

A broad ETF may match *one* of these dimensions (e.g., sector), but it almost always distorts others. The result is not just tracking error—*it is unintended factor rotation*.

Examples of hidden risks from a broad tax loss replacement can include:

- **Style drift:** Replacing a low-volatility, defensive stock with a sector ETF that carries higher cyclical.
- **Volatility mismatch:** Introducing a materially different variance profile during a period when volatility itself is being repriced.
- **Correlation shock:** Increasing overlap with existing holdings, thereby raising portfolio-level concentration risk.
- **Factor timing risk:** Accidentally rotating into or out of rewarded (or punished) factors during the wash-sale window.

These effects are rarely obvious in isolation, but over repeated harvesting cycles they compound. The tax savings are realized—but so is the structural leakage from imprecise reinvestment. The central question, therefore, is not whether to harvest capital losses, but how tightly the replacement exposure can be controlled while doing so.

From “Similar” to “Statistically Equivalent”

Instead of defining similarity categorically (same sector, same index family), the tax-loss security replacement algorithm defines similarity in over a multitude of unique risk factors from Morgan Stanley’s Portfolio Risk Platform.

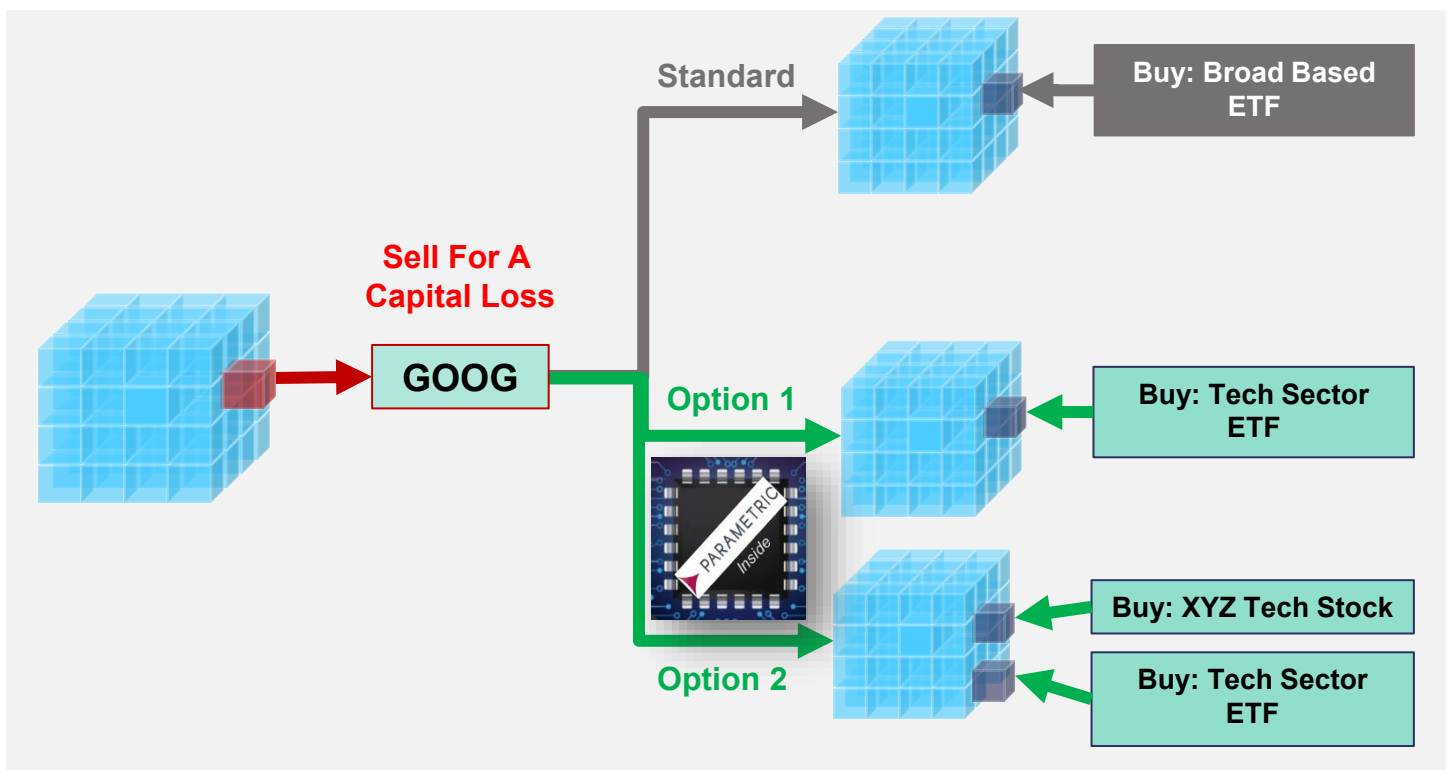
Each security is classified according to its multi-factor risk profile, capturing:

- Systematic market exposure
- Sector and industry factors
- Style factors (e.g., size, value, momentum)
- Volatility characteristics (level, sensitivity, and asymmetry)
- Residual (idiosyncratic) risk

This creates a quantitative “risk footprint” for both the sold security and every potential replacement.

What This Looks Like In Your Account

When a security is harvested, we leverage the new replacement methodology to buy into a factor correlated sector ETF or ETF and individual security replacement.



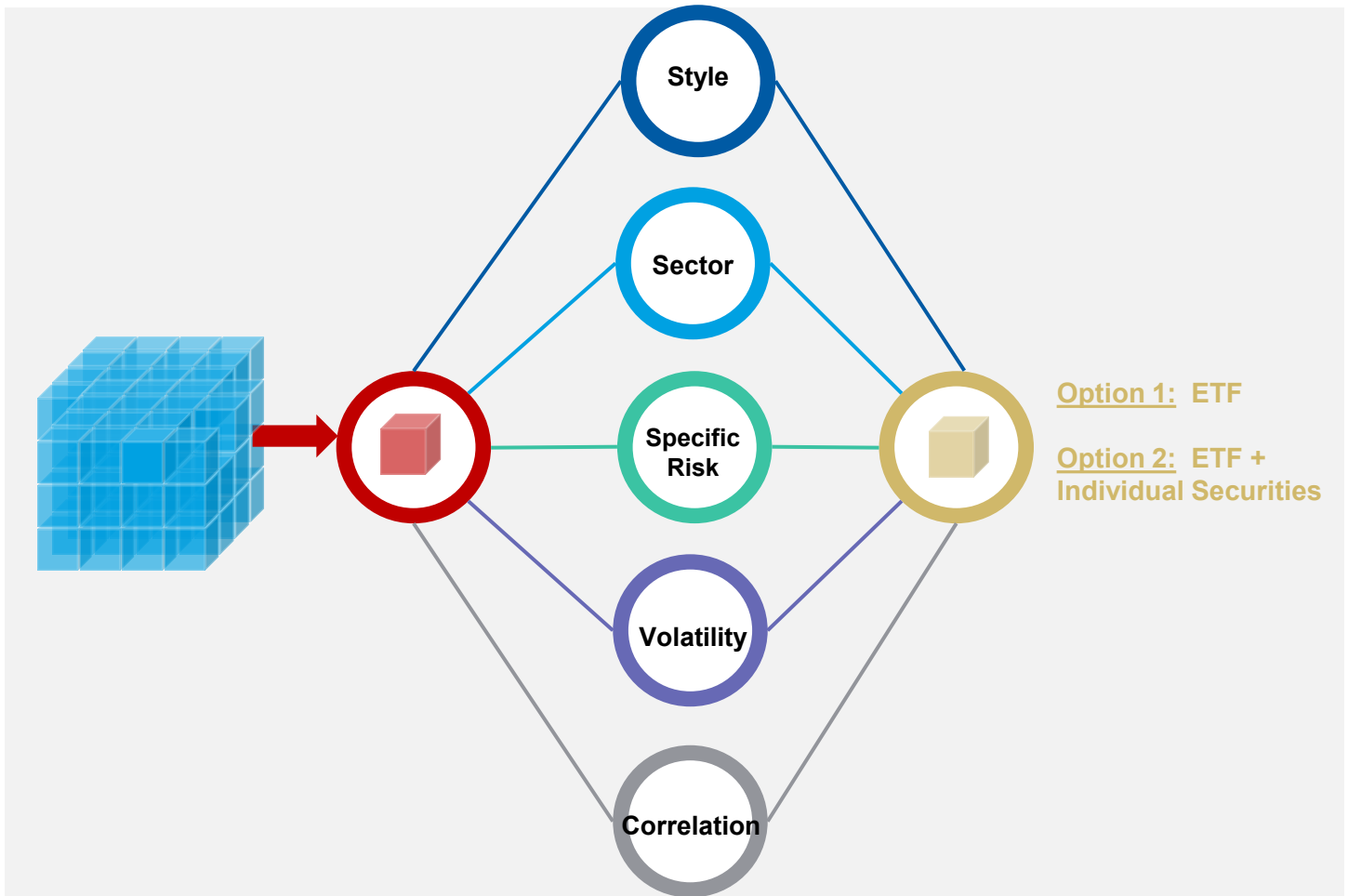
Optimization In Action

Replacement selection is framed as a constrained optimization problem with a single primary objective: Minimize expected (*ex-ante*) tracking error during the wash-sale period, while preserving the portfolio's intended risk structure. This is achieved subject to constraints on:

- **Factor alignment:** limit deviations in key style and sector exposures
- **Volatility parity:** avoid step-changes in variance or drawdown sensitivity
- **Idiosyncratic risk controls:** prevent over-reliance on single-name substitutes
- **Portfolio-level interactions:** limit increases in correlation and concentration

We Review A Multitude of Risk Factors To Find Your Ideal Replacement:

Each replacement is evaluated to ensure that decisions do not degrade global portfolio behavior. You now have a powerful engine that combines the best of the Portfolio Risk Platform and Parametric's index replication technology to help manage your federal income tax liability without the unknown risk.



Disclosures:

Tax laws are complex and subject to change. This information is based on current federal tax law in effect at the time this was written. Morgan Stanley, its affiliates and Morgan Stanley Financial Advisors and Private Wealth Advisors do not provide tax or legal advice. Morgan Stanley clients should consult their tax advisor for matters involving taxation and tax planning.

Morgan Stanley offers investment program services through a variety of investment programs, which are opened pursuant to written client agreements. Each program offers investment managers, funds and features that are not available in other programs; conversely, some investment managers, funds or investment strategies may be available in more than one program. Morgan Stanley's investment advisory programs may require a minimum asset level and, depending on a client's specific investment objectives and financial position, may not be appropriate for the client. Please see the applicable program disclosure document for more information, available at www.morganstanley.com/ADV. Transitioning from a brokerage to an advisory relationship may not be appropriate for some clients. Investing in the markets entails the risk of market volatility. The value of all types of securities, including mutual funds and exchange-traded funds, may increase or decrease over varying time periods. Diversification and asset allocation do not assure a profit or protect against loss. Past performance is not a guarantee of future results. Rebalancing does not protect against a loss in declining financial markets. There may be a potential tax implication with a rebalancing strategy. Clients should consult their tax advisor before implementing such a strategy. The annual asset-based fee (charged monthly) does not cover (1) the cost of investment management fees and other expenses charged by Funds, (2) "markups," "markdowns," and "dealer spreads" that we or other broker-dealers may receive when acting as principal in certain transactions, (3) brokerage commissions or other charges resulting from transactions not effected through us or our affiliates, (4) any Morgan Stanley Wealth Management account establishment, maintenance or termination fees for Plans, which are set forth in the respective Plan account and fee documentation (which may change from time to time), or (5) certain costs or charges imposed by third parties, including odd-lot differentials, transfer taxes, exchange fees, and fees or taxes required by law. In addition, the Fee does not include charges associated with the use of certain cash management services, such as check writing and ATM / Debit card services. Generally, investment advisory accounts are subject to an annual asset-based fee (the "Fee") which is payable monthly in advance (some account types may be billed differently). In general, the Fee covers Morgan Stanley investment advisory services, custody of securities with Morgan Stanley, trade execution with or through Morgan Stanley or its affiliates, as well as compensation to any Morgan Stanley Financial Advisor. In addition, each account that is invested in a program that is eligible to purchase certain investment products, such as mutual funds, will also pay a Platform Fee (which is subject to a Platform Fee offset) as described in the applicable ADV brochure. Accounts invested in the Select UMA program may also pay a separate Sub-Manager fee, if applicable. If a client's account is invested in mutual funds or exchange traded funds (collectively "funds"), they will pay the fees and expenses of any funds in which their account is invested. Fees and expenses are charged directly to the pool of assets the fund invests in and are reflected in each fund's share price. These fees and expenses are an additional cost to the client and would not be included in the Fee amount in their account statements. The advisory program the client chooses is described in the applicable Morgan Stanley Smith Barney LLC ADV Brochure, available at www.morganstanley.com/ADV. Morgan Stanley or Executing Sub-Managers, as applicable, in some of Morgan Stanley's Separately Managed Account ("SMA") programs may effect transactions through broker-dealers other than Morgan Stanley or our affiliates. In such instance, the client may be assessed additional costs by the other firm in addition to the Morgan Stanley and Sub-Manager fees. Those costs will be included in the net price of the security, not separately reported on trade confirmations or account statements. Certain Sub-Managers have historically directed most, if not all, of their trades to outside firms. Information provided by Sub-Managers concerning trade execution away from Morgan Stanley is summarized at: www.morganstanley.com/wealth/investmentsolutions/pdfs/adv/sotresponse.pdf. For more information on trading and costs, please refer to the ADV Brochure for your client's program(s), available at www.morganstanley.com/ADV. The Portfolio Analysis report ("Report") is generated by Morgan Stanley Smith Barney LLC's ("Morgan Stanley") Portfolio Risk Platform. The assumptions used in a Report incorporate portfolio risk and scenario analysis employed by BlackRock Solutions ("BRS"), a financial technology and risk analytics provider that is independent of Morgan Stanley. BRS's role is limited to providing risk analytics to Morgan Stanley, and BRS is not acting as a broker-dealer or investment adviser nor does it provide investment advice with respect to the Report. Morgan Stanley has validated and adopted the analytical conclusions of these risk models.

Any recommendations regarding external accounts/holdings are asset allocation only and do not include security recommendations.

IMPORTANT: The projections or other information provided in a Report regarding the likelihood of various investment outcomes (including any assumed rates of return and income) are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Hypothetical investment results have inherent limitations.

There are frequently large differences between hypothetical and actual results.

Hypothetical results do not represent actual results and are generally designed with the benefit of hindsight.

They cannot account for all factors associated with risk, including the impact of financial risk in actual trading or the ability to withstand losses or to adhere to a particular trading strategy in the face of trading losses.

There are numerous other factors related to the markets in general or to the implementation of any specific strategy that cannot be fully accounted for in the preparation of hypothetical risk results and all of which can adversely affect actual performance.

Morgan Stanley cannot give any assurances that any estimates, assumptions or other aspects of the risk analyses will prove correct. They are subject to actual known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those shown in a Report.

Parametric is a part of Morgan Stanley Investment Management, an affiliate of Morgan Stanley Smith Barney LLC.

There is no guarantee that tax-loss harvesting will achieve any particular tax result. Clients may elect Tax Management Services for the account by notifying their Financial Advisor, and indicate what Maximum Tax or Realized Capital Gain Instruction is desired for the account, if any. The Tax Management Services Terms and Conditions attached to the Morgan Stanley Smith Barney LLC Select UMA ADV brochure as Exhibit A will govern Tax Management Services in the account. Review the Morgan Stanley Smith Barney LLC Select UMA ADV brochure carefully with your tax advisor. Tax Management Services are not available for all accounts or clients and may adversely impact account performance. Tax Management Services do not constitute tax advice or a complete tax-sensitive investment management program. There is no guarantee that Tax Management Services will produce the desired tax results.