NORTHFIELD modeling financial markets worldwide

Optimal Wash Sale Behavior for Taxable Portfolios

See disclaimer on Slide 3

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Webinar

July 2023

Introduction

- Since the 1995 introduction of tax functionality into the Northfield Optimizer, the system has had functionality which addresses "wash sale" restrictions on the deductibility of capital losses.
- There are wash sale rules in the tax code of several countries (e.g. UK) so the Optimizer was designed to be quite flexible in how wash sale rules are incorporated into optimization runs.
- For most countries including the US, the **basics** of the wash sale rules are fairly simple. However, decades of Tax Court decisions and IRS rule interpretations mean there are many "exceptions to the rule" that are more difficult to address in an algorithmic fashion.
- *Levels of concern about wash sales varies widely across our clientele with some managers wanting to eliminate any possible wash sale, and others choosing to allow transactions that might result in the disallowance of a related tax deduction.*
- To address the heterogenous nature of manager attitudes, today's presentation will provide a framework for *achieving economically optimal wash sale behavior.*

Disclaimer

- I am not a tax attorney, so nothing in this webinar should be construed as legal or tax advice.

- However, Northfield frequently consults with one of the top tax attorneys in the country, who was the managing director at their major corporate law firm for many years.
  - We routinely confirm the appropriateness of the wash sale behavior of our algorithms whenever a client questions why the Optimizer operated in a particular fashion with respect to a particular transaction.

- The wash sale algorithm in the Optimizer is updated from time to time to keep up with the heterogenous nature of manager desires and changes in regulation.
  - We have a set of over seventy different test cases to prove out that wash sale algorithm in the Optimizer is working the way we think it should work.

The Basic Wash Sale Rule for the US

- *An investor cannot claim a capital loss as a tax deduction* on the selling of capital assets (e.g. share of stock) if the investor purchased the same asset in the 30 days before or after the sale date.

- If a claimed tax deduction is disallowed by the IRS, the lost economic value can ***usually*** be reclaimed by the taxpayer as an adjustment to the cost basis of remaining held units of the same asset for use in a subsequent tax year.

- The evaluation of *whether a transaction would or would not trigger wash sale disallowance can be complex when there are multiple transactions in the same asset with overlapping wash sale periods.*

- The wash sale rule is applied to securities only, so it does not routinely apply to commodities, currencies, and crypto assets.

The Quant Portfolio Manager Mental Model

- At each moment in time during the tax year, portfolio trades are made based on some combination of considerations of return, risk, trading costs, and taxes, ***based only on factual data knowable at the time.***

- To the extent that taxes are a consideration, the processing of the portfolio involves tagging each lot with a serial number so that the tax effects of a transaction *can be estimated **before** the trade based on the acquisition date and cost basis of lots.*

- After transactions are undertaken, the serial number information identifying which lots were transacted when is maintained as it existed in real time through the tax year. End of year tax summaries are prepared accordingly.

Old School Wealth Manager Mental Model

- Trades are done based on a fundamental investment process. Decision criteria for most of the year are focused on returns, with risk a secondary consideration.
- Taxes become a dominant consideration in the week between Christmas and the year-end through *manual* examination.
- There is no "pre-trade" identification of lots to be transacted. Some trade order management systems don't even allow lot level serial numbers to be identified.
- After each trade is completed, a manual analysis is done ***in hindsight*** of existing tax lots to determine which lot is likely to be the most favorable to identify as being sold to minimize taxes and hopefully avoid wash sales.
- This process is obviously labor intensive if portfolio turnover is not close to zero.

IRS/Accountant Mental Model / Nicomachean Ethics

- During the tax year, portfolio trades arise for a variety of reasons that are of no concern to the tax authority except in cases of blatant tax evasion.
- Any identification of lots being associated with particular trades during the tax year is irrelevant and of no consequence.
- *After the tax year is over (say February of the following year), the investor has complete hindsight of which lots to select as having been bought or sold at various points, and will only then calculate what tax gains and losses have been experienced based on the investors choice of which lots to recognized as sold.*
- The IRS assumes investors choose which lots were bought or sold when to minimize taxes due.
- *In this case, Agathon was wrong in saying "Even unto the Gods it is forbidden to change the past."*

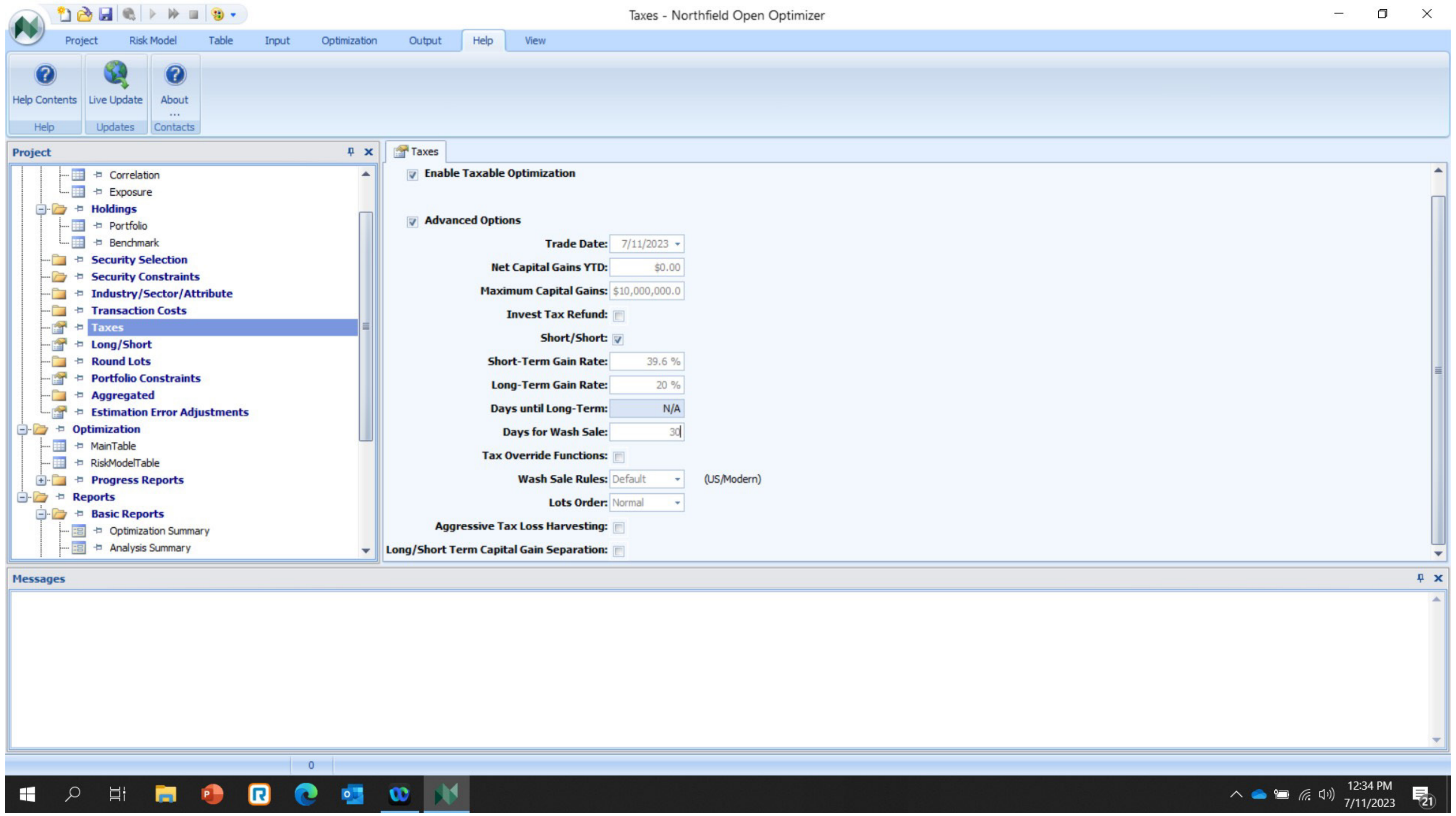
Northfield Optimizer Wash Sale Functions

- You can choose the length of the wash sale period (i.e. 30 days)

- You can choose two modes (Modern, Traditional)

- Modern mode includes algorithmic revisions made in the past year for the US. Detailed documentation was distributed then and is available from Northfield, see **www.northinfo.com/docs/wash.pdf**

- Traditional mode is more applicable to a range of countries.



Inducing Some Simple Behaviors for the US

- You can turn the wash sale functions off completely (i.e. allow wash sales) by changing the "number of days" for wash sale consideration to zero.

- *You can provide the greatest possible avoidance of wash sales by setting the "number of days" to sixty-one, which covers the possibility of overlapping thirty-day periods when multiple transactions must be considered.*

- The "Modern" mode puts existing lots within the defined wash sale period sorted into LIFO order. While not "black letter law", the IRS has rarely disallowed deductions due to wash sale reasons when the investor can demonstrate LIFO order of sales.
  - Using LIFO the investor was not "picking and choosing" optimal lots to maximize tax deductions.
  - LIFO order would minimize the expected value of price moments, reducing the "tax timing option" compared to FIFO.

The Tax Timing Option and Wash Sales

- Tax managed portfolios often ignore *consideration of the option value of properly timing the realization of tax losses.*
  - Whenever an investor could realize a tax loss, they also have the **option to wait** to possibly realize that loss at a later date.
  - Papers on the tax loss timing option include
    - Kalotay (JPM 2014), Kalotay (FAJ, 2016)
    - Kang, Paradise, and Dickson (FAJ, 2021)
    - Israelov and Lu (2022)
    - Davis, Li, and Nemtchinov (JBIS, 2022)

- As the value of the tax timing option is related to asset volatility, the interrelationship between portfolio risk and the "option to tax loss harvest later" can be built into the parameterization.

- Most of these papers sidestep the issue of wash sales by assuming you don't trade more than once in thirty-one days, as does Ang, Moehle, Boyd and Kochenderfer (Blackrock WP, 2021).

Asset Managers are Supposed to be Fiduciaries

- There is an obvious middle ground between "never allow a wash sale" and "we don't care about wash sales because the IRS doesn't catch most of them."

- There are no economically rational standards for measuring after-tax investment performance.
  - Returns are upward biased in multiple ways
  - Economic value of unrealized gains and losses is ignored (i.e. the taxes will probably be paid in the future)
  - diBartolomeo (*Journal of Performance Measurement,* 2021) provides an economically sensible approach.

- *The obvious need is for managers to prevent or allow wash sales in particular situations when making the correct decision is economically beneficial to the investor.*

Considerations of Optimal Wash Sale Behavior

- Carrying out a particular transaction where a tax loss is generated, but where the IRS is likely to disallow the loss due to the wash sale rules, generally (but not always) means that the remaining shares of the position will have an adjusted cost basis going forward.
- Many managers assume that closing out a position so there are no remaining shares will never result in a wash sale disallowance.
  - Our tax counsel advises that some combinations of "overlapping" wash sale periods can cause wash sale disallowance, even in close out situations.
  - This means that any disallowed deductions may not be able to be recaptured in the cost basis of the remaining shares, since there are no remaining shares.
- In the more usual situation of a wash sale resulting in adjusted basis for remaining shares, any tax benefit of realizing a disallowed loss in the current tax year must be discounted as the actual economic benefit will be in a future tax year.
  - *The key questions are how big a discount and how to express that in an optimization.*

Defining the Magnitude of Discount

- If a tax deduction in the current year is worth X, how much is that deduction worth next year or the year after?
- In formulating the discount rate to be applied to the economic value of a tax loss for optimization purposes, there are multiple considerations.
  - Time value of money in terms of expected returns to the portfolio or a safer investment.
  - Applicability of using the loss to offset the $3000 ordinary income allowance
  - Possible changes in tax rates
- The most uncertain input is the probability of needing the tax loss in future years.
  - Mortality rates: will the investor be alive? (no capital gain tax effects on the dead)
  - Current embedded gains in the portfolio
  - The market could crash eliminating embedded gains and providing ample losses.
  - The need for losses to offset possible gains in active management.

Data Gathering for Optimal Wash Sale Methods

- *We want to allow wash sales only when it is in the investor's best interest to do so.*
- First, we can run the optimization in the normal fashion and observe the set of recommended trades.
- Next, run the same optimization with "wash sale days" set to zero, turning off any consideration of wash sales and look at the list of trades.
- The trades present in the first optimization but not present in the second optimization are the trades that were blocked by our wash sale algorithms.
  - *Our reports allow analysis of amounts of tax losses that are likely to be disallowed for the current tax year on a trade-by-trade basis and which specific tax lots are involved.*

Adjusting Inputs for Optimal Wash Sales

- The Northfield Optimizer allows for "user adjustments" to cost basis and acquisition date of lots which then used in the Optimizer objective function.
  - The adjusted data can be added into the .SHL file input format.
  - The original (unadjusted) information for cost basis and acquisition date of a lot is maintained so that calculations of actual taxes due are correct.

- The nature of the adjustment to a given lot is accomplished by changing the cost basis of the lot so that losses look smaller to the degree of the chosen discount.
  - If I have a stock now trading at $50 that was bought at $60, the capital loss is $10 per share.
    - If we believe that the IRS will disallow the loss for wash sale reasons, we can adjust the cost basis to $58, so the Optimizer now sees an $8 capital loss which is the true capital loss discounted 20%
  - The acquisition date of lots can also be adjusted to change certain behaviors by moving the lot from inside to outside the wash sale period.

- **Change the "wash sale days" parameter to one day, and optimize in the usual fashion.**

Conclusions

- Asset manager attitudes about the wash sale rules are widely disparate.
- While basics of the US "wash sale rule" are broadly understood, there are many nuances and special cases that are the subjects of interpretation by lawyers and tax courts.
- The Northfield Optimizer has complex algorithms that address wash sales in ways that are consistent with the legal opinions of our tax counsel, but the functions are flexible so that managers can customize wash sale behavior to their own preferences. *Detailed documentation is available here:* **www.northinfo.com/docs/wash.pdf**.
- As fiduciaries, manager should be trying to do what is economically in the interest of investors but this is made more difficult by performance reporting standards that are insufficiently sophisticated to be realistic.
- We have provided an approach to parameterizing optimizations to allow or prevent instances of wash sales based on discounting tax effects that are deferred into future years.