ALLIANCEBERNSTEIN®

The Next Generation of Fixed-Income Tax-Loss Harvesting

How Tech-Driven Tax Optimization
May Turn Losses into Gains

IN THIS PAPER

Taxes matter to a bond investor's bottom line.
That's why we've brought a digital, high-speed
solution to fixed-income active tax management.
By continually optimizing separately managed
accounts to identify opportunities to harvest
losses and by efficiently reinvesting the proceeds
in tax-favorable opportunities, automated tax
management has the potential to add more than
90 basis points to after-tax returns in some years,
according to our in-depth analysis.

2022

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Head of Fixed Income SMA Solutions

Executive Summary

Today's investors increasingly demand active tax management of their separately managed accounts (SMAs). And they should: Taxes matter to an investor's bottom line. Our research shows that technology-driven, systematic tax optimization can help minimize an investor's tax burden and materially boost after-tax returns.

What AB's Research Shows

Fixed-income SMAs employing systematic tax optimization can realize meaningful tax alpha. Our historical simulation employing AbbieOptimizer:

- Added 92 basis points to after-tax returns in 2021
- Added 153 basis points to cumulative after-tax returns from 2018 through 2021

Unfortunately, few fixed-income managers are up to the challenge. While many equity solutions already consider automated tax-loss harvesting essential, the bond manager who employs tech-driven tax optimization is a rare breed. The vast majority of bond managers provide only limited, manual and unsystematic tax management—and often only in the last months of the year. Others provide no tax management at all. And that leaves significant after-tax dollars on the table.

That's why we've developed a high-performance digital engine for the active tax management of bond portfolios. AB's proprietary technology, AbbieOptimizer, digitizes the municipal-bond portfolio construction process and enables a tax-loss harvesting strategy through sophisticated optimization, pricing, liquidity and execution tools.

By continually optimizing accounts to identify opportunities to harvest losses and by instantly reinvesting the proceeds in tax-favorable opportunities, automated tax management maximizes after-tax results. And that's what all investors deserve from their fixed-income managers.

In Pursuit of Tax Alpha

Investors have long focused on pre-tax returns. But attitudes are changing. Today's high-net-worth investors recognize the power of tax alpha, a measure of outperformance attributable to tax-optimization strategies. As such, more investors—and their asset managers—are looking to add to returns in their SMAs using tax-loss harvesting tools. Already, rapid technological advances are bringing automated tax optimization to a broad swath of retail stock portfolios.

With tax optimization so common when investing in equities, why is it so rare in fixed income? There are three big challenges that make tax management harder to do for bonds than stocks:

Scale	Fragmentation	Transaction Costs
The municipal bond market alone comprises more than one million unique bonds, representing more than 50,000 issuers. By comparison, the entire US stock market has fewer than 4,000 unique tickers. This poses a big-data challenge for bond managers when optimizing across an SMA platform.	Most municipal trades happen in small lots, with 95% of all muni trades in lot sizes below $1 million. Fragmented pockets of liquidity make it challenging to identify opportunities to realize losses. And manual tax-loss harvesting results in fresh cash to reinvest, adding to the burden.	The cost of trading bonds shouldn't come as a surprise, especially when it could outweigh the tax benefit being targeted. Without sophisticated, real-time measures of transaction costs and pricing, it's impossible to maximize each client's tax opportunities across thousands of individual accounts and cost bases.

Fortunately, the structural inefficiencies that make fixed-income tax management so challenging are many of the same reasons that automated tax optimization offers big potential tax alpha for fixed-income portfolios.

First, the bond market's vast size becomes a rich hunting ground when tax-loss harvesting with high-tech tools. When investors need to find an attractive replacement for a bond sold at a loss, their chances are better in a bigger pool. Managers with the right technology can systematically scan, compare and choose a replacement bond with an equal or higher yield, while preserving the portfolio's structure and attributes.

Second, natural turnover and cash flow from maturities and coupon payments create regular opportunities to reset the investor's cost basis. This can create future opportunities to tax optimize and generate valuable tax alpha. In contrast, opportunities for tax-loss harvesting in equity portfolios can be quickly exhausted. At that point, any further tax management becomes unhelpful, because remaining stocks—including replacements—have locked in a lower cost basis.

Systematic, tech-driven tax alpha is especially desirable in today's environment of puny bond yields and low return expectations.

Active Tax Management 101

By systematically optimizing portfolios, bond managers can uncover opportunities to transform an investment that has lost money into a tax winner through a strategy called tax-loss harvesting. Tax-loss harvesting involves selling an underperforming security at a loss that can be used to offset realized gains anywhere in the investor's overall asset allocation. Proceeds from the sale go toward buying a replacement security. By efficiently repeating the process, less money goes to taxes and more money stays invested.

Sometimes a portfolio's capital losses exceed the portfolio's total gains for the tax year, but these losses needn't go to waste. In fact, these excess losses can be applied on federal tax returns against gains in future years for the rest of a taxpayer's life. They can even be used to offset up to $3,000 in ordinary income per year or to offset capital gains from the sale of a residence or business.

A given security's tax benefit depends on how long the investor has held the tax lot. Short-term capital gains and losses are those realized from the sale of investments owned for one year or less. Such gains are taxed at ordinary income tax rates, which for high-income earners can be as much as 40.8%. Long-term capital gains and losses are realized on the sale of investments held for more than a year. Long-term capital gains rates are much lower (*Display 1*).

DISPLAY 1: LONG-TERM CAPITAL GAINS RATE BY FILING STATUS AND INCOME

Long-Term Capital Gains Tax Rate	Single Tax Filers	Married Filing Jointly
0%	$40,000 or less	$80,000 or less
15%	$40,001–$441,450	$80,001–$496,600
20%*	$441,451 or more	$496,601 or more

*When the 3.8% Net Investment Income Tax comes into play, the actual long-term capital gains tax rate for high earners can be as much as 23.8%.

As of January 1, 2022 | **Source**: Internal Revenue Service

Terms to Know

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Big Data Large data sets that, when analyzed, reveal patterns, trends and associations

Cost Basis A security's original purchase price, adjusted for amortization or accretion

Excess Losses Combined investment losses that are larger than gains for the tax year, and which are generally used for tax-favorable treatment in future years

Separately Managed Account A portfolio of individual securities managed by an investment firm and in which the client owns all holdings directly

Smart Algorithm In artificial intelligence, a process or set of rules governing calculations, operations or problem-solving

Speed Alpha The additional income accrued from investing portfolios faster than the industry average

Tax Alpha A measure of relative outperformance attributable to tax-optimization strategies

Tax Benefit Materiality Threshold The minimum level of benefit that the investor would need to make a tax-loss harvesting opportunity worthwhile

Tax-Loss Harvesting The process of selling a security at a loss to offset a capital gains tax liability

Tax Optimization A strategy to maximize investor after-tax portfolio returns, primarily through automated tax-loss harvesting and deferral of gains

Trading Alpha The execution price minus the bond's end-of-day independent pricing service mark divided by the account assets under management

Wash Sale Rule An IRS restriction against purchasing the same security that was sold at a loss (or one that is nearly identical to it) within 30 days of the sale

This calculus is particularly important to high earners who are subject to the highest rates, as it means that harvesting losses can be quite valuable. Short-term losses are more valuable than long-term losses, as they can capture a tax benefit of up to 40.8%. And high earners may want to defer gains beyond one year to lower the tax rate on those gains to 20%.

That's why the most effective tax-optimization tools monitor each SMA in tandem with the individual investor's specific tax situation, with the aim of generating the largest tax alpha possible for each investor's portfolio. SMA managers who use granular tax-lot information in combination with digital optimization stand to generate meaningful tax alpha.

Why Manual Tax-Loss Harvesting Isn't Up to the Job

Many managers claim to do active tax management, but their approach is manual, infrequent and unsystematic. Less frequent and irregular loss harvesting can result in missed opportunities and meaningfully lower after-tax returns. And it's often done as an afterthought in the last months of the year, to beat the December 31 deadline—leaving most of the year's opportunities uncaptured.

For example, interest-rate volatility throughout 2021 presented attractive opportunities for tax alpha all year long. The typical manager who only reviews portfolios for opportunities to harvest losses in December wouldn't even have been aware of opportunities in the other months.

Just as problematic, these manual tax-management strategies may only identify harvest candidates among large blocks of bonds co-held across SMAs based on average tax bases and tax rates—ignoring investors' unique cost basis and tax situation and delivering suboptimal after-tax results for most individual clients.

What's worse, bond managers who rely on manual processes for tax-loss harvesting typically lack the state-of-the-art technology that allows them to quickly identify pools of liquidity and reinvest swiftly in a huge, fragmented and fast-moving market. The result? Poor execution and idle cash while the proceeds from harvesting wait to be manually reinvested—creating an unacceptable drag on performance.

Tech-Driven Tax Optimization: A Quantum Leap in Active Tax Management

AB has significantly expanded the reach of AbbieOptimizer—our bond portfolio-management engine[1]—with a smart algorithm that optimizes tax-alpha opportunities in real time across our fixed-income SMA platform. The tax-optimization algorithm is now one of three tech-powered alpha generators—along with trading alpha and speed alpha—to build and manage bespoke portfolios for each SMA client, at scale across thousands of portfolios.

Our tax-optimization algorithm systematically screens for attractive tax-loss sale candidates based on three considerations:

Tax Benefit: The algorithm's assessment of the trade's tax benefit, also known as the tax benefit materiality threshold, ensures we're only harvesting opportunities that offer meaningful losses, while avoiding unproductive turnover.

Transaction Cost: The algorithm evaluates each trade based on the lot size being sold and uses our proprietary transaction cost models to estimate the expense associated with each opportunity.

Replacement Bond: Before harvesting, the algorithm also considers the expected excess return of each held position, which is derived from our quantitative modeling. Bonds with attractive expected returns typically won't be harvested if we can't find an attractive replacement bond on the other side.

To demonstrate the algorithm's effectiveness, we ran realistic historical simulations by plugging four years of market data into the algorithm—with compelling results.[2]

Four Ways Fixed-Income Tax Optimization Isn't Like Equities

Tax optimization for fixed income isn't like tax optimization for equities, because the markets differ in their key challenges and advantages:

The challenge of liquidity and transaction costs. Stock markets have centralized exchanges for trading and highly transparent pricing and transaction costs. In contrast, most municipal trades are of very small lots, with the most commonly traded lot size less than $25,000. This results in fragmented pools of liquidity and unpredictable transaction costs. That's why effective and scalable tax optimization for municipal portfolios requires a technological solution that includes sophisticated, real-time measures of transaction costs and pricing.

The challenge of reinvestment. By the same token, given the complexity and speed of the municipal bond market, tech-driven solutions to reinvestment are a must. Managers who rely on manual processes to reinvest proceeds from tax-loss harvesting face an unacceptable drag on performance as cash sits idle while managers hunt for replacement bonds.

The advantage of natural turnover. Opportunities for tax-loss harvesting in equity portfolios can be quickly exhausted, with remaining stocks—including replacement securities—locked in at a lower cost basis. In contrast, bond portfolios experience natural turnover and cash flow from maturities and coupon payments. In turn, these create regular opportunities to reset the investor's cost basis and optimize taxes.

The advantage of a bigger market. When tax-loss harvesting, it's critical to select a replacement security that doesn't violate the IRS's wash-sale rule. This is much more readily accomplished in fixed income than in equities. Because of the vast size of the municipal market, managers have a huge pool of potential replacements at their fingertips, with more than a million unique bond issues. In contrast, the US stock market has fewer than 4,000 tradeable tickers. As a result, tech-savvy fixed-income managers can quickly identify replacement bonds with similar risk attributes to the bond sold—without violating the wash-sale rule.

1 Terrance T. Hults, Matthew Norton, and Gavin Romm, "Technology Enables Municipal Investing at the Speed of Alpha," *The AB Blog on Investing* (blog), AllianceBernstein, August 2, 2021, https://www.alliancebernstein.com/corporate/en/insights/investment-insights/technology-enables-municipal-investing-at-the-speed-of-alpha.html

2 Weekly index data was not available prior to October 2018. Tax alpha may therefore be underrepresented due to less frequent optimization of the portfolio in the months before October 2018.

Tax-Optimization Algorithm Simulation: Objective and Assumptions

Our goal is to sell positions where the tax benefit outweighs any costs associated with displacement. Therefore, we require two conditions to be met for every candidate for tax-loss harvesting—both in practice and in our simulation. First, the tax benefit of the trade must be greater than or equal to the cost of the trade; and second, the expected excess return of the sale candidate must be less than or equal to that of the assumed replacement bond. The formulas for these criteria are

$$\text{Tax Benefit}_H \geq \text{Transaction Cost}_H$$

and

$$\text{EER}_H \leq \text{EER}_R$$

Where Tax Benefit_H is the tax savings on a given holding;

$\text{Transaction Cost}_H$ is the transaction cost on a given holding;

EER_H is the expected excess return of the holding; and

EER_R is the expected excess return of the assumed replacement bond.

In order to approximate reality as closely as possible in our simulation, we applied our algorithm to a representative index—the Bloomberg Municipal Bond Index—that stood in for a "live" portfolio. We also used conservative assumptions for transaction costs and liquidity to create realistic tax-alpha opportunities and implementation.

In practice, however, each investor's experience may vary depending on differences in their costs bases and tax rates, which we apply on an individual level when assessing the tax benefit for each SMA. In addition, when trading, we aggregate commonly held bonds across SMAs to reduce incurred transaction costs as much as possible. When bonds are traded in isolation, transaction costs can easily outweigh the tax benefits, whereas trading across multiple accounts can reduce costs enough that it makes sense to harvest the loss.

Tax-Optimization Algorithm Simulation: Methodology

1. To begin, we assumed the purchase of every bond in the index at marked-to-market prices as of the simulation's inception date. We conservatively assumed a constant lot size of $25,000 and a corresponding transaction cost of $0.80 (relative to the price).[3]

2. The tax-optimization algorithm then systematically screened the portfolio for attractive tax-loss sale candidates based on tax benefit, transaction cost and potential replacement bond.

3. With initial sale candidates selected, we performed a break-even analysis and harvested the loss if the tax benefit outweighed the cost of displacing the position. Cash from the simulated sale was then reinvested in a similar bond at bid side, which we assumed to be $0.40.[4] (We consider this a realistic simplifying assumption, since the harvested bond would, in practice, be replaced with a bond of a similar risk profile.) We updated the cost basis for the held security based on current market price and adjusted the amortization/accretion schedule in the simulation accordingly. To reflect the lower liquidity of the muni bond market compared to the index, we also conservatively assumed a 50% capture, or success, rate on all sale candidates in each harvesting period.

4. We rebalanced the benchmark monthly to account for bonds being added to or removed from the index due to new issuance, maturities and other reasons. Bonds removed from the index were not counted toward tax alpha.

5. At the end of every tax-loss harvesting period,[5] we calculated the tax benefit or liability of each holding by subtracting the book value, adjusted for amortization/accretion, from the current market price; dividing the result by the total market value of the position; and multiplying that result by the applicable tax rate, depending on whether the position was held for the long or short term. We then subtracted the bid-ask spread to account for the cost to trade the position, given its size. The final result is the tax alpha for a given holding:

   $$\text{Tax Alpha}_H = \text{Tax Benefit}_H - \text{Bid/Ask}_H$$

6. Lastly, we calculated the total tax alpha of the portfolio for each period by summing all the individual tax alphas of the trades multiplied by their corresponding portfolio weights.

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3 Our simulation conservatively assumed that harvesting was not feasible during March and April 2020 at the onset of the COVID-19 pandemic, given limited liquidity and a dramatic increase in transaction costs.
4 In practice, we prevent the purchase of an identical or meaningfully identical bond to avoid generating a wash sale.
5 Index data used in our simulation was available monthly until October 2018 and weekly thereafter.

## Tax-Optimization Algorithm Simulation: Results

The results of our simulation provide a number of takeaways. First, we found that **some market environments are especially ideal for high-speed, tech-driven tax optimization**. For example, our simulation generated 82 basis points and 92 basis points of tax alpha in 2018 and 2021, respectively—years in which interest rates were particularly volatile. Why? Fluctuating yields present numerous but fleeting opportunities to add tax alpha—which means investors must be nimble to identify sales candidates, sell them and replace them at higher book yields. The opportunity to harvest losses slips away if yields fall before the bond is sold. That makes a volatile yield environment ideal for high-speed, digital tax optimization.

In February and March 2021, for instance, yields on the Bloomberg Municipal Bond Index bounced between 0.9% and nearly 1.3%, before returning to around 1.0% in April. By systematically harvesting losses in February and March, our simulation generated a cumulative 24 basis points of tax alpha (*Display 2*). This underscores the need to quickly reinvest the proceeds from tax-loss harvesting to lock in a higher yield on a replacement bond—another key benefit of a tech-empowered process.

DISPLAY 2: VOLATILE INTEREST RATES PROVIDED MAJOR TAX-ALPHA OPPORTUNITIES

Simulated Tax Alpha: 2018 (Basis Points)

Monthly (left)   Cumulative
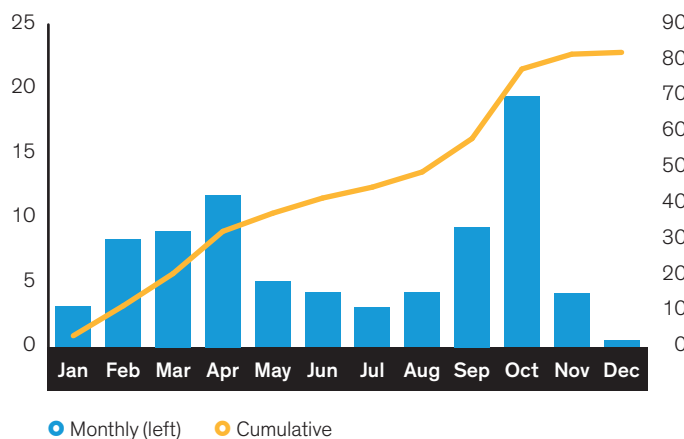
Simulated Tax Alpha: 2021 (Basis Points)

Monthly (left)   Cumulative
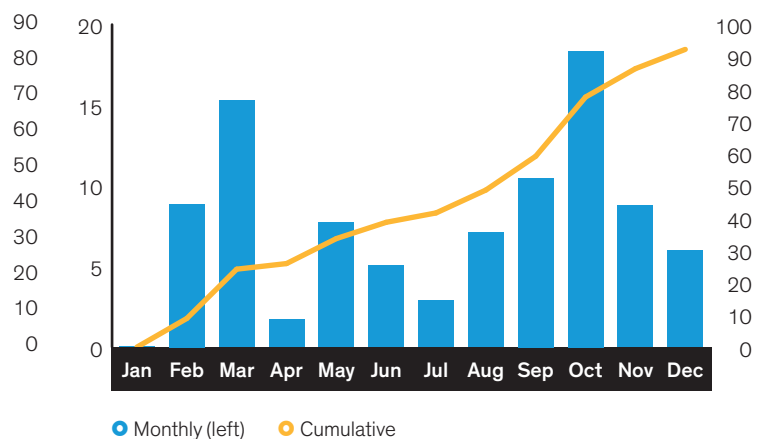
Average Yield to Worst: 2018 (Percent)

Average Yield to Worst: 2021 (Percent)

Historical simulation is for illustrative purposes only. Past performance is no guarantee of future results.

Average yield to worst is for the Bloomberg Municipal Bond Index; analysis presents individual years as initial years of investment.

Through December 31, 2021 | **Source:** Bloomberg and AllianceBernstein (AB)

Of course, not every year can generate big tax alpha. Our simulated tax alphas for 2019 and 2020 were comparatively modest, at eight basis points and 18 basis points, respectively. Still, in a low-return environment, every basis point matters to the investor.

Our simulation also allows us to compare first-year investor experiences generating tax alpha to cumulative experiences in tech-driven tax management over multiple years. Not surprisingly, **investors in their first year in an SMA reaped the most benefits**, thanks to the much higher rate (up to 40.8%) at which short-term capital gains are taxed.

The benefit is reduced as a larger portion of the investor's portfolio migrates to lower long-term tax rates in subsequent years. For example, *Display 3* shows that an investor could have earned eight basis points of tax alpha in 2019 if it had been their initial year of investment in an SMA. But if 2019 were the portfolio's second year in an SMA, their tax alpha would have been six basis points.

Nonetheless, on a cumulative basis, **tech-driven tax optimization can add meaningfully to after-tax returns over the life of an SMA**. In our simulation, an investor who held a tax-optimized fixed-income SMA realized more than 150 basis points in cumulative tax alpha over the four years ending December 31, 2021 (*Display 4*).

DISPLAY 3: TAX ALPHA WAS MOST POWERFUL IN INITIAL YEAR OF INVESTMENT

Initial vs. Subsequent Investment Years: Simulated Tax Alpha (Basis Points)
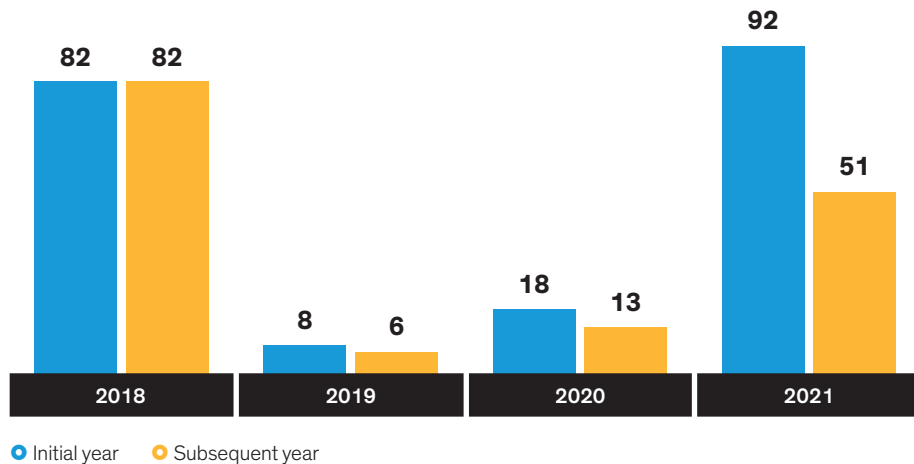
● Initial year ● Subsequent year

Historical simulation is for illustrative purposes only. Past performance is no guarantee of future results.

Through December 31, 2021 | **Source:** Bloomberg and AB

DISPLAY 4: CUMULATIVE TAX ALPHA WAS SIGNIFICANT OVER TIME

Subsequent Year vs. Cumulative Experience 2018–2021: Simulated Tax Alpha (Basis Points)
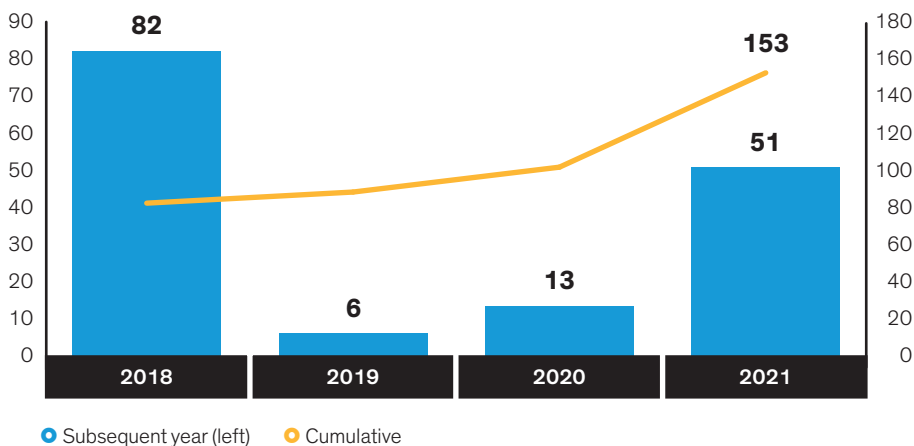
● Subsequent year (left) ● Cumulative

Historical simulation is for illustrative purposes only. Past performance is no guarantee of future results.

Through December 31, 2021 | **Source:** Bloomberg and AB

Finally, the results of our simulation suggest that **bond managers can dramatically increase investors' tax alpha by harvesting much more frequently** than they currently do. While most managers harvest for tax losses in December, we optimize for taxes throughout the year and continually.[6] Our simulation allowed us to compare outcomes for weekly tax optimization all year long to tax optimization for December only. In every year of our simulation—2018 through 2021—weekly optimization delivered significantly more tax alpha, with a cumulative tax-alpha advantage of nearly 1% over December-only harvesting (*Display 5*).

DISPLAY 5: MORE FREQUENT TAX OPTIMIZATION LED TO BIGGER TAX ALPHA

Full-Year Weekly vs. December-Only Tax Optimization: Simulated Tax Alpha (Basis Points)

Subsequent Years of Investment (2018–2021)
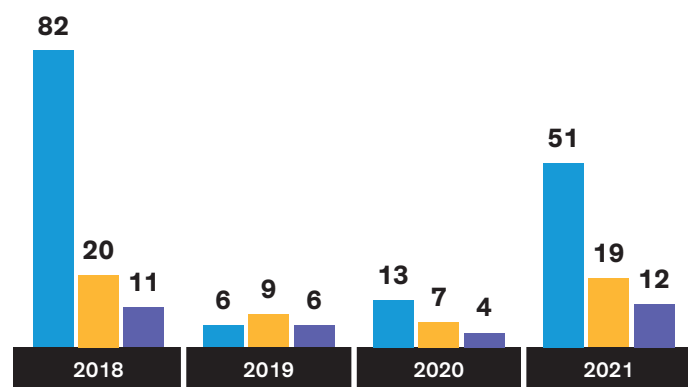
Cumulative Experience (2018–2021)
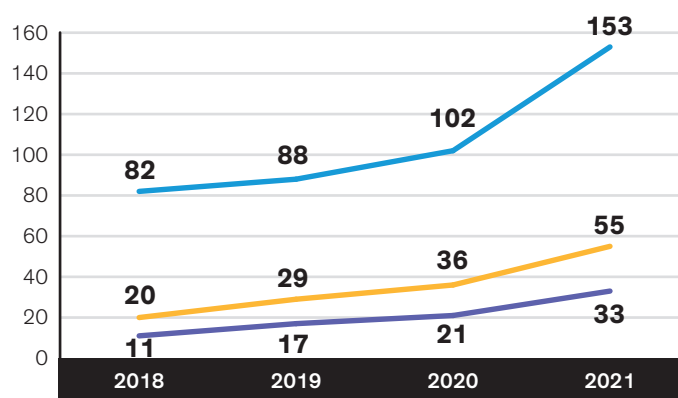
○ Weekly ○ December only ○ December only (50% identification rate)

Historical simulation is for illustrative purposes only. Past performance is no guarantee of future results.

Data reflects initial investment year (2018) followed by subsequent years of investment (2019–2021). Numbers may not sum due to rounding.

Through December 31, 2021 | **Source:** Bloomberg and AB

What's more, that already sizable advantage assumes that the manager harvesting in December has a perfect capture rate—finding the most attractive harvesting opportunities given an investor's unique tax data, securing the best available pricing and transaction costs, and identifying and immediately buying a replacement bond. In other words, it assumes the December-only manager is fully digital.

That is a generous but unrealistic assumption, considering the same managers restricted to year-end harvesting are also constrained by manual processes. We therefore included a 50% capture rate as a conservative estimate for a manual tax-harvesting process. The result was a cumulative advantage of 1.2% in tax alpha for frequent, digital tax optimization versus manual year-end efforts.

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6 In practice, we favor daily tax optimization.

Next-Generation Tax Management Turns Losses into Alpha

High-net-worth investors increasingly demand active tax management of their SMAs. And they should: our research shows that technology-driven, systematic tax optimization can help minimize an investor's tax burden and materially boost after-tax returns. That's especially valuable in today's environment of low yields and weak expected returns.

Unfortunately, not all managers are up to the challenge. Instead, most bond managers provide only limited, manual and unsystematic tax management—often in a crunch to meet year-end deadlines. Others provide no tax management at all. That leaves significant after-tax dollars on the table.

To maximize tax alpha, we believe that tax-management strategies should:

- Be digitized and automated to efficiently capture and accurately evaluate opportunities to harvest losses while limiting unnecessary turnover;

- Be customized to each investor's specific tax rates and cost basis;

- Explicitly consider tax benefit, liquidity, transaction costs, expected return and yield when choosing bonds for harvesting as well as replacement bonds;

- Employ sophisticated optimization, pricing, liquidity and execution tools;

- Continually scan accounts to identify opportunities in real time;

- Swiftly reinvest the proceeds in tax-favorable opportunities to avoid performance drag from idle cash; and

- Use cash flow generated by coupon payments and maturing bonds to reset the investor's cost basis, creating future opportunities to tax optimize.

For asset managers who haven't kept pace in the digital age, the sheer size, speed and fragmented liquidity of the municipal bond market make an insurmountable mountain out of these criteria.

But for bond managers with the willingness and ability to develop game-changing technologies, tech-driven tax optimization presents a new frontier for sourcing meaningful tax alpha. That's why our own high-performance digital engine enables automatic, bespoke and scalable active tax management.

And now that the next generation of fixed-income tax-management is within reach, bond investors should expect nothing less.

Tax-Alpha Checklist: Is Your Asset Manager Up to the Challenge?

Tax-aware investing is in more demand than ever, but that doesn't mean just any municipal bond manager can maximize tax alpha. Given a huge and fragmented market, many managers struggle behind the scenes to keep up. If you're not sure whether your manager is fully optimizing your tax-aware investment strategy, start with a few key questions:

- **Do you use automated tax optimization within your fixed-income SMA products?** Many managers claim to do active tax management, but their approach is manual, infrequent and unsystematic—and typically in a crunch toward year-end. That leaves significant after-tax dollars on the table. To maximize tax alpha, active tax management should be automated and continual throughout the year.

- **After harvesting losses, how quickly are you able to reinvest the sale proceeds?** Reinvestment should be ultraefficient. Generating alpha requires speed, especially when markets are stressed. And faster investing adds value for clients: muni assets that are invested earn more interest than those that aren't, while idle cash creates unacceptable drag on performance.

- **What trading or portfolio-management tools do you use across SMAs to take advantage during volatile markets?** Without integrated, real-time digital systems, it's impossible for a team to efficiently build and manage customized portfolios when markets get rocky. When evaluating potential bonds in any conditions, unnecessary operational friction can cause managers to lose out on trades if others can move faster and more efficiently.

- **What are you doing to adapt to changing liquidity in the muni market?** When liquidity is fleeting and scarce, seconds can matter. Managers who aren't addressing liquidity conditions with a tech-powered solution could find themselves in the desert when markets dry up. They're also leaving alpha on the table.

- **Can you dynamically screen the market in real time based on my individual needs and preferences?** Finding bonds is only half the battle—they must also be priced appropriately and fit each client's specifications. When optimizing portfolios, muni managers must bring together portfolio manager intelligence, unique client preferences, fundamental research and real-time liquidity analysis into a trade list for hundreds of portfolios and positions.

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