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WHITE PAPER

How Do You Spell Relief?

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Many Financial Advisors (FAs) invest in municipal bonds for their clients in basically the same way they have for the past 30 years. When asked why they build their own portfolios and don't use an active manager, most FAs say, "The cost isn't worth the benefit. Besides, my clients prefer it this way." History suggests that this perspective may not be in the clients'—or the advisor's—best interests.

This paper is designed for FAs who are experiencing the challenges built in to the municipal bond marketplace. We begin with a historical look at what happens when blind spots are ignored. We then examine the highly fragmented and inefficient muni bond market and the implications for retail advisors. Finally, we offer FAs a solution: AllianceBernstein's technology-enabled active bond investing.

If History Is Any Guide…

In the early 1980s, Australian pathologist Dr. Barry J. Marshall noticed that many of the peptic ulcers he was analyzing via biopsy were infected with a type of bacteria called *H. pylori*. This didn't make sense at the time; conventional wisdom held that bacteria couldn't survive in the stomach. Marshall knew that *H. pylori* could be easily treated with a course of antibiotics and suspected that surgically removing the ulcers was unnecessary. He attempted to publish his findings, but his research was rejected.

Out of frustration, Marshall infected himself with *H. pylori* by drinking a broth of cultured bacteria. Within days he had severe gastritis, which he successfully treated with antibiotics. Even after Marshall published his results, he was nevertheless disregarded by mainstream practitioners for years. The surgeons who made their living operating on ulcers fought him every step of the way. It wasn't until 2005 that Marshall's groundbreaking research was recognized with the Nobel Prize in Physiology or Medicine.[1] Today, surgery is no longer indicated for ulcers because they can be treated quickly with a short course of antibiotics.

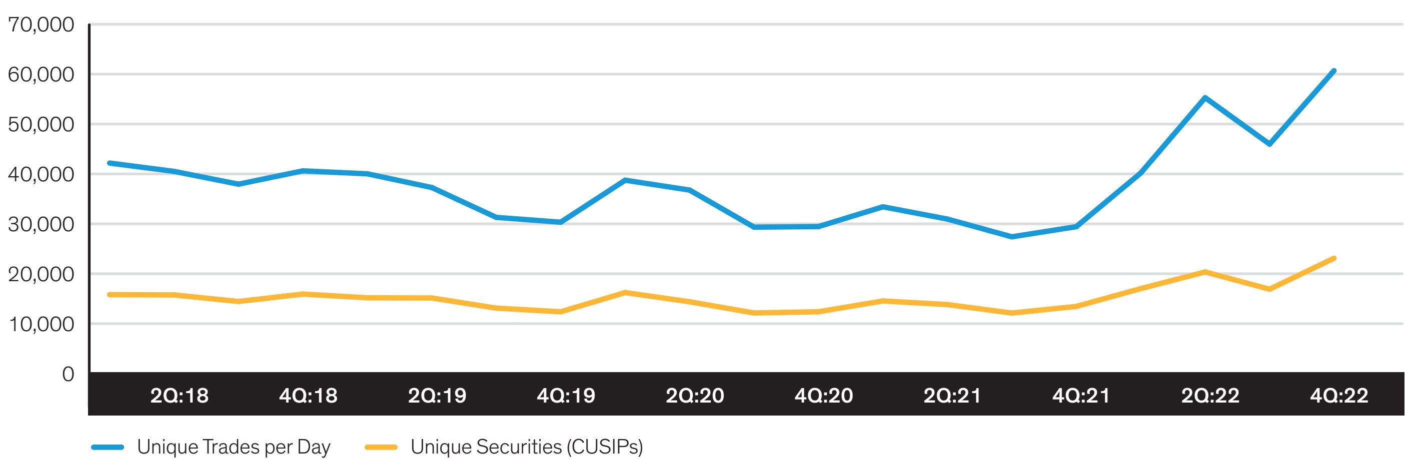
Many FAs have a similar blind spot when it comes to investing. Municipal bonds have been a familiar and highly attractive investment for successful investors for decades, but changes in the muni bond market have resulted in a number of hidden problems that most FAs are not aware of—or simply ignore. This means that many advisors still build muni portfolios the same way they did three decades ago, using antiquated and inefficient techniques that negatively affect their clients.

What Are These Negative Effects?

Municipal bonds represent a safe market, but one that is highly fragmented and inefficient. This fragmentation creates five impairments that are impossible for the traditional bond buyer to overcome.

1. There is a massive data problem in the municipal market. There are over 1 million CUSIPs and more than 50,000 issuers.[2] Even if all the information about these bonds were available in one place (which it isn't) and remained static (which it doesn't), advisors can't sort through this huge amount of information to find the best bonds currently available for their clients.
2. The problem is actually worse than just lots of information. What is available for sale is constantly changing, moment by moment. There are more than 80,000 line items available for an advisor to consider every day. The blue line in *Display 1* shows the 35,000 to 40,000 trades per day in the muni market; within that, 10,000 to 25,000 are unique securities, indicated by the yellow line, as some CUSIPs trade more than once. This is a massive moving target that is far too complex for a single FA or even a team to make sense of.

DISPLAY 1: MUNI TRADES ARE FRAGMENTED ACROSS THOUSANDS OF BOND ISSUES

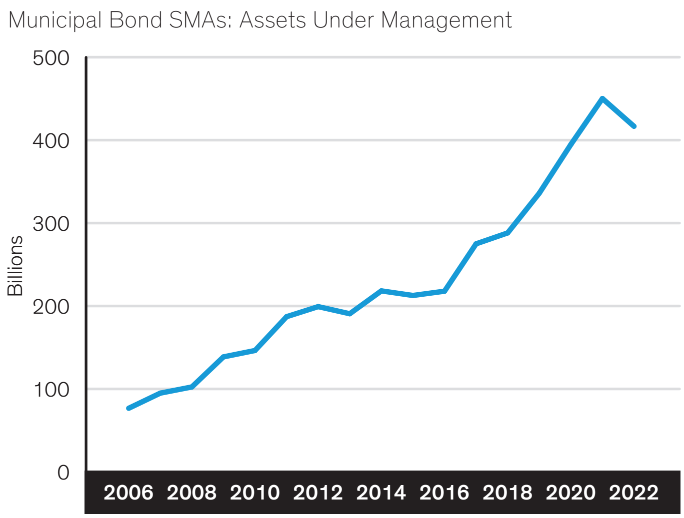


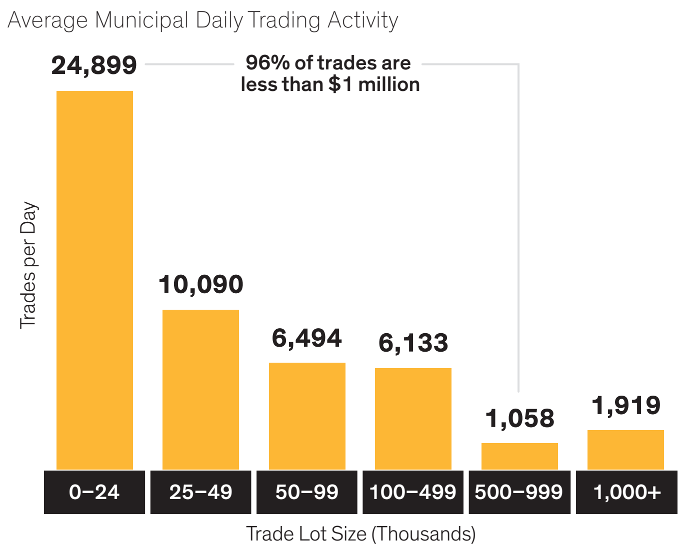
Past performance and historical analysis do not guarantee future results.

As of December 31, 2022 | **Source**: Municipal Securities Rulemaking Board and AB

1 Pamela Weintraub, "The Doctor Who Drank Infectious Broth, Gave Himself an Ulcer, and Solved a Medical Mystery," *Discover* (April 8, 2010)
2 Municipal Securities Rulemaking Board

DISPLAY 2: THE MARKET IS CONTINUING TO EVOLVE, LEADING TO MORE FRAGMENTATION





Past performance does not guarantee future results. There can be no assurance that any investment objectives will be achieved.

Right-hand chart is average daily trading volume for all of 2022.

As of December 31, 2022 | **Source**: Electronic Municipal Market Access, Morningstar and AB

This means that if advisors use a traditional approach to buying bonds, they are considering only a tiny part of the entire market. Their human limitations force them to simplify the problem, so they inevitably miss opportunities.

3. There are multiple platforms on which bonds are traded, and they are increasingly transacted digitally. Today there are five main platforms that municipal bonds trade through: Bloomberg, Tradeweb, MarketAxess, the Muni Center and bonds sourced directly from dealer balance sheets. No human advisor can monitor every platform at once and sort out the constantly changing stream of data. And as trading becomes more digitalized and as the speed of change on the platforms increases, opportunities will appear and vanish faster and faster.

   Ironically, these platforms are intended to make investing in bonds more efficient. But this can only happen if the buyer has the access, computing power and expertise to analyze the constantly changing market. Digital platforms massively increase opportunities; consider the difference between selling a car on Facebook Marketplace and posting an ad on the bulletin board in your apartment building. Digital platforms bring buyers and sellers together more efficiently.

   Unfortunately, as helpful as they are, these platforms have also fundamentally changed the way information about bonds can be accessed, and the traditional bond buyer is effectively cut off from most of these opportunities. There is just too much information in too many places changing too quickly.

   In some cases, advisors can only select from the inventory at their firm, which represents only a tiny fraction of the bonds currently available in the market. These bonds already have an additional cost by virtue of being held in inventory. This means that the traditional bond buyer is unable to access the entire market and that the available bonds are more expensive.

4. As the number of municipal bond separately managed accounts (SMAs) has grown over time, investors' need for liquidity has created a huge amount of smaller transactions (*Display 2*). It is quite common for investors to liquidate some of their bond holdings in order to make a major purchase. They need their money quickly, and some bonds are sold from their SMA. These smaller transactions create a pricing opportunity for a bond buyer *if he can see this small transaction in a blizzard of other information*. The number of municipal bond SMAs is continuing to grow, and these liquidity-based transactions will increase with that growth.

5. The economic cycle has shifted; we are now investing in a rising-rate environment. This represents an increased challenge that most current muni bond investors have never experienced: we have not seen these conditions in more than 40 years, since the early 1980s.

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No individual human brain can sort out and understand 40,000 transactions a day. Even a team cannot grapple with this much information. Using technology is the only way this problem can be solved.

Ken Haman—Managing Director,
AllianceBernstein Advisor Institute

In the past we have seen rising-rate environments, but nothing as severe at this, since rates started at 0%. It's only recently that traditional bond buyers have generally enjoyed a falling or sideways interest-rate environment. This means they could hold a bond for several years and expect its value to increase as rates continued to drop. At the very least, the value would stay mostly stable over time, and clients could clip their coupon and roll the proceeds from maturing bonds back into the market.

Today, conditions are completely different; 2020 and 2022 were the most volatile years for municipal bonds in the past 40 years. Traditional bond buyers saw meaningful losses in their bond portfolios, many for the first time in their lives. As volatility continues, clients will eventually question the approach their advisor is using.

Importantly, as interest rates continue to rise, it is not in a client's best interests to hold. In a rising-rate environment, a bond purchased a year ago is far less valuable than a bond purchased today at a much higher rate. In this way, when things change and rates go up, the portfolio must change with it, or the client is the one who loses.

As markets have changed, the traditional "set it and forget it" approach has become as obsolete and ineffective as ulcer surgery. Even short periods of time can represent huge challenges for investors in a rising-rate environment.

For example, a 10-year municipal bond purchased in January 2022 had a yield of 0.78%. Just one year later, that same 10-year bond had a yield of 2.64%.[3] In these conditions, buying a bond and throwing it in a box create a situation where the client loses out on potential higher levels of income because she is holding the lower-yielding security—that is, unless something changes.

What Does This Mean to a Financial Advisor?

These changes have four serious implications for retail FAs. Clients don't care how you invest for them *unless they experience unexpected losses in their "safe" investments*.

1. If you don't have the data-processing ability to observe, analyze and understand the huge amount of information that is constantly changing in the muni marketplace, you cannot find all the opportunities, you cannot exploit inefficiencies, and you will be leaving money on the table.

   No individual can even begin to tackle this data-sorting problem; not even a team of people can handle it. There is simply so much information available that it overwhelms a person's ability to process it. Investing in bonds has become a huge "needle in a haystack" proposition.

   The natural reaction of the human brain faced with a complex problem is to automatically and unconsciously simplify it. Behavioral economists call this narrow framing. Since there are a massive number of muni bonds available, buyers revert to a universe of securities that is significantly limited. This simplifies the problem and protects the buyer from being overwhelmed, but it also ignores many opportunities outside of this available universe of bonds. While the buyer may find the process more manageable, the investor pays a steep price in missed opportunities.

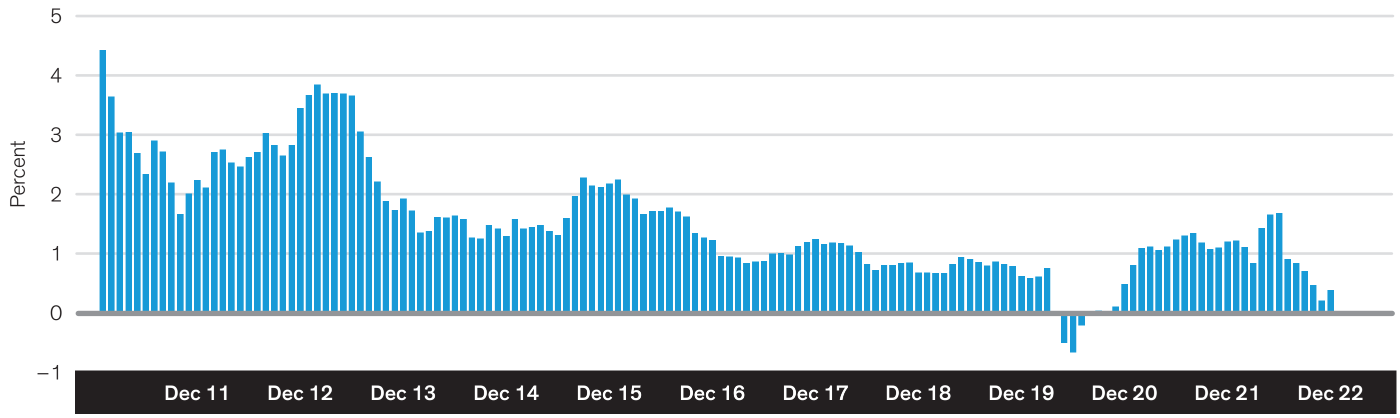
2. Tax management can be another problem for advisors. Increasingly, clients expect their advisor to reduce the impact of taxes; in fact, the capability to manage tax implications has become the core value proposition of many advisors and a firm expectation of investors. The traditional "put a bond in a box" approach doesn't allow for effective tax-loss harvesting in a rising-rate environment.

3. Traditional approaches lack customization, another feature of actively managed SMAs that clients expect. Without the ability to assess all of the opportunities present in the market at any given time, the advisor simply cannot create a portfolio that perfectly conforms to a client's specific needs.

4. Having the ability to explore and assess the entire bond market, target unique pricing opportunities, customize her clients' portfolios, and harvest losses in a rising-rate environment can make an advisor more referable in the eyes of CPAs and other professionals. Being able to explain the challenges of investing in bonds and showing a center of influence how it can be done are the keys to a powerful way to differentiate and elevate the value of a practice.

DISPLAY 3: ACTIVE MANAGERS OUTPERFORM THEIR PASSIVE PEERS 98% OF THE TIME

Rolling Two-Year Average Outperformance



Past performance and historical analysis do not guarantee future results.

Rolling returns are cumulative. Analysis is from January 2009 to December 31, 2022. The returns presented above are gross of fees. The results do not reflect the deduction of investment-management fees; the client's return will be reduced by the management fees and any other expenses incurred in the management of its account. Passive returns are defined as the average of all laddered strategies within the Morningstar US SA Muni National Intermediate category. Active returns are defined as the average return of all active strategies within the Morningstar US SA Muni National Intermediate category. January 2009 is the start date for performance because that is when the first municipal ladder strategy appears within Morningstar.

As of December 31, 2022 | **Source**: Morningstar

Traditional Active Management Can Help, but It Isn't Enough

Comparing active management with passive approaches reveals that active managers outperform their passive peers 98% of the time[4] (*Display 3*). In the same way a patient with a stomach ulcer would never opt for surgery if a course of antibiotics would work, a well-informed client would never elect for buy-and-hold over an active approach. In both cases, the obsolete method is just too painful.

Importantly, even traditional active managers are capturing only a fraction of the value that is available in the marketplace: there is just too much information for a human brain—even a team of brains—to process, comprehend and undertake. Just like their passive peers, active teams are overwhelmed by the amount of information they must digest. This has several important implications.

- Portfolios take longer to fully invest.
- Investment opportunities get overlooked.
- The manager can't be active in the market at scale.
- Tax management is limited or nonexistent.
- There is little to no transparency around trading activity.
- Managers can't exploit price inefficiencies.

Each of these implications has a direct detrimental effect on client portfolios. Clients expect and deserve to receive the best execution possible. Unfortunately, even a traditional active manager cannot deliver superior results with an inferior approach.

There Is a Better Way: AB Technology-Enabled Active Bond Investing

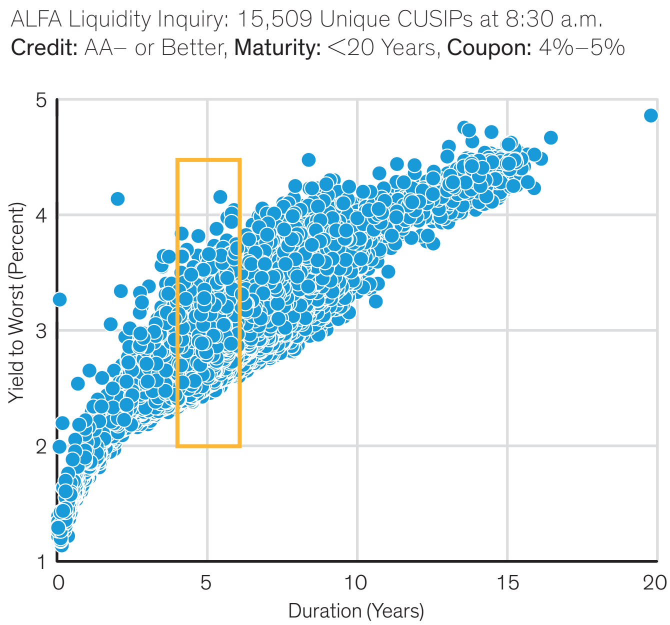
Until recently, if you were a retail FA, you had three choices: build portfolios yourself out of your firm's (limited and expensive) inventory, hire a passive manager to babysit a portfolio of bonds, or hire an active manager and outsource the difficult task of finding the right bonds.

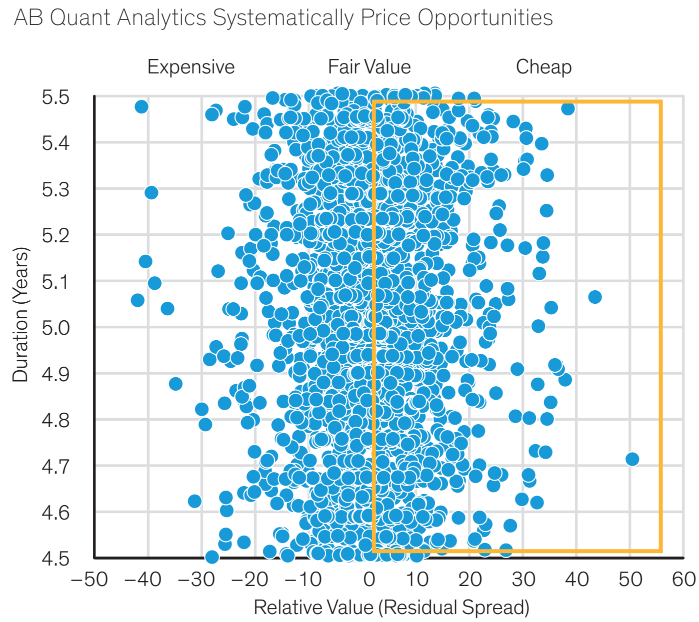
Today, you have a fourth option: a *technology-enabled* active approach intentionally designed to overcome the challenges built in to the municipal bond marketplace. This one-of-a-kind capability, combined with AB's long-standing expertise in municipal bond investing, offers a truly elevated approach.

- Superior results start with access. We have the size, the expertise, and the electronic connection to all major platforms and broker-dealers, which gives us a transparent and holistic view into municipal market liquidity and trading activity on a daily basis.

DISPLAY 4: AB'S DATA AGGREGATION SOLVES TODAY'S MARKET COMPLEXITIES

AB's proprietary liquidity aggregation system, ALFA, centralizes all municipal bond offerings into one location. Then, AB's quant model screens the market for attractive relative value opportunities, sorting the market by expensive, fair value and cheap.





Past performance does not guarantee future results. For informational purposes only. There can be no assurance that any investment objectives will be achieved.

As of December 31, 2022 | **Source**: Bloomberg and AB

- Our technology aggregates the entirety of the investable universe in one centralized location. This provides an organized view of the wide range of securities to choose and add value from, similar to how services like Expedia work for the airline industry. Every day we scrape hundreds of thousands of messages and bond offerings from different platforms into a centralized digital database. Embedded in this mass of information are inherent and persistent inefficiencies that our managers can take advantage of *because they know where to look*.
- We now have the ability to analyze, price and execute on every attractive opportunity in the marketplace (*Display 4*). By leveraging our digitalized credit research database and quantitative pricing model, we have the unique ability to analyze every opportunity that is available for sale on a daily basis. We can decide which bonds are attractively priced and which bonds are not good fits for portfolios. This capability has a quantifiable benefit to advisors in the form of trading and speed advantages that we can measure in basis points of additional return.
- We can directly connect real-time market opportunities to the underlying needs of our customized municipal bond SMA portfolios. AB's one-of-a-kind patented portfolio-management engine, AbbieOptimizer, creates a seamless ecosystem by digitally connecting all of our investment systems. It's the key to generating alpha through trading and speed in AB's municipal bond portfolios. Our proprietary portfolio construction engine integrates liquidity, pricing, research and portfolio-management inputs to build customized client portfolios.

This digital ecosystem allows us to take a custom client portfolio from inception to execution faster and with better results than traditional processes.

DISPLAY 5: AB TECHNOLOGY-ENABLED BOND INVESTING ADDS, ON AVERAGE, 79–119 BASIS POINTS TO A PORTFOLIO

Trading Advantage: Digital and more efficient trading is required to execute on mispriced bonds in the market. AB drives additional performance through achieving best execution in the muni marketplace.

Trading Alpha
+20 to 40 basis points

Speed Advantage: Advancements in technology have enabled us to fund portfolios more quickly and efficiently. The benefits of speed are straightforward: assets invested faster begin earning carry sooner.

Speed Alpha
+10 to 30 basis points

Tax Optimization: Tax-loss harvesting is often left until year-end. Our sophisticated tax optimization screening tool incorporates each client's unique cost basis, transaction cost analysis, and replacement bond evaluation.

Tax Alpha*
+49 basis points

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AB calculates three types of technology-driven alpha—trading, speed and tax—from additional performance generated by AbbieOptimizer. Trading alpha is the average of AB's execution price less the bond's end-of-day evaluation price on that day divided by the account AUM. Speed alpha is additional income accrued from investing portfolios faster than the industry average of 50 days and at higher yields. Yield used for proxy is the Bloomberg Intermediate Managed Money Index versus the composite statistic of AB SMAs. Tax alpha is based on a back-tested simulation of a representative index (Bloomberg Municipal Bond Index) applying AB's production tax-optimization algorithm. The back test was applied to calendar years 2018–2021. The tax alpha, speed alpha and trading alpha achieved will differ between strategies and portfolios.

Adapt or Become Obsolete

As market conditions change, each portfolio needs to actively adapt. In today's rising-rate environment, bonds that were attractive two years ago are very different from those that are attractive now. A manager needs to adapt client portfolios based on future expectations. There are traditional methods that managers have employed, but without technological tools, it is often too little, too late. AB's technology-enabled approach allows us to proactively manage portfolios as conditions change and efficiently add value in seven unique ways.

1. **Duration/interest-rate management.** By adjusting a portfolio's duration based on expectations of rising or falling rates, we can better protect client capital or increase returns.
2. **Yield-curve positioning.** Based on the shape, slope and expectations for future movements, active managers can switch between various yield-curve structures such as concentrated, barbell or laddered yield-curve approaches to add value.
3. **Credit selection and risk management.** Because of its extremely low historical default rates, allocating to municipal credit can increase portfolio income and provide the added upside in price performance, especially when spreads are wide, as they are today.
4. **Flexible investing in taxable bonds if it makes sense on an after-tax basis.** A portfolio of municipal bonds makes sense most of the time for high-tax-bracket investors. But occasionally, taxable securities can offer the benefit of increased after-tax yield and reduced volatility when municipals become expensive. AB's flexible mandate takes advantage of these occasional dislocations to supplement returns.
5. **Inflation protection.** Inflation has become an increasing concern given today's macro backdrop. AB's technology-enabled approach can add to tax-efficient inflation protection within portfolios to add value.
6. **Tax management.** Proactive tax management adds to after-tax returns through tax alpha. This is only possible with a technology-enabled approach.
7. **Technology.** Our digital innovations create measurable advantages in trading and speed that are quantifiable at an account level. For example, in 2022 we purchased bonds at a 72-cent discount: if a bond was priced at $105 on average, we bought it for $104.28, providing additional execution savings for every client.[5]

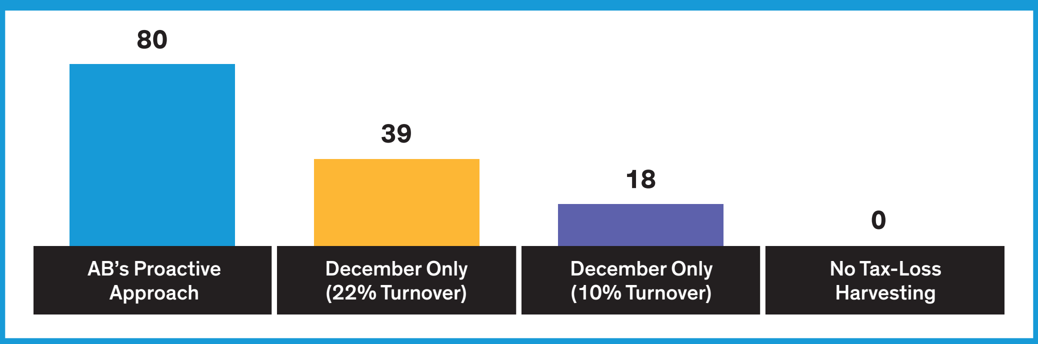
Why Tax-Loss Harvesting Is Important

Case Study: 2022 was one of the worst years of performance in the history of the municipal market. The silver lining to a poorly performing municipal bond market is the ability to harvest tax losses, which effectively increases a portfolio's yield and creates a tax asset for clients that never expires. Unfortunately, given the inefficiencies of the municipal market, the vast majority of bond managers provide only limited, manual and unsystematic tax management. Some provide no tax management at all. This leaves significant after-tax dollars on the table.

AB Utilizes Technology to Deliver Enhanced Tax Outcomes: AllianceBernstein provides a holistic tax-loss harvesting program. Our tax-loss harvesting process leverages technology to systematically screen for attractive tax-loss sale candidates across all our client SMA portfolios. Our process takes into account clients' bespoke cost basis at the tax-lot level as well as their tax rate, paired with a comprehensive analysis on current market liquidity, estimated transaction costs, and the expected return of the replacement security. By proactively optimizing accounts to screen for opportunities to harvest tax losses, technology-enabled tax management maximizes after-tax results compared to other approaches.

PROACTIVE TAX-LOSS HARVESTING GENERATES BETTER AFTER-TAX OUTCOMES THAN WAITING UNTIL DECEMBER

Calendar Year 2022: Tax Alpha Estimates



Past performance and historical analysis do not guarantee future results. This analysis is for illustrative purposes only and is subject to change.

AB's proactive approach is a measure of realized tax alpha across AB's municipal SMA suite in 2022. December only (22% turnover) is the average turnover of the Morningstar US SA Muni National Intermediate category, assuming a –6.50% average loss, 80% in long-term losses and 20% in short-term losses. December only (10% turnover) is the third quartile of turnover of the Morningstar US SA Muni National Intermediate category, assuming a –6.50% average loss, 80% in long-term losses and 20% in short-term losses.

As of December 31, 2022 | **Source**: Bloomberg and AB

A Choice That Matters for You and Your Clients

As you think about moving your practice forward, creating meaningful value for clients and differentiating your services, here are some things to consider.

- AB is the only provider of technology-enabled active muni bond management through our patented optimization engine.
- The only way to successfully navigate the complexity of today's marketplace is with a technology-based solution. AB's technology-enabled active investing proactively adapts to changing liquidity trends in the muni marketplace.
- The technology massively expands the investment universe to provide a much wider range of opportunities to exploit pricing inefficiencies.
- The approach adds 20 to 40 basis points of trading alpha, on average, to each portfolio (*Display 5*).
- The average SMA takes 50 to 90 days to fully invest a portfolio; our technology-enabled approach does it in a fraction of that time. This "speed alpha" adds another 10 to 30 basis points, on average, to each portfolio, if market conditions warrant it.
- SMAs that do offer tax-loss harvesting often wait until year-end. Our technology-enabled approach *systematically* incorporates each client's unique cost basis, transaction cost analysis, and replacement bond evaluation and can bolster an investors after-tax return through tax alpha.

For the past 30 years, industries have evolved by utilizing new technologies that create disruptive efficiencies and add value. In many cases, when the idea for a new solution is proposed that will shift a dominant paradigm, the big, established players become threatened and push back, like the doctors who built their livelihood on treating stomach ulcers with surgery. Others react with skepticism: "It'll never work" or "It's too good to be true!"

The fact is that when the right technology is paired with human expertise and applied to an existing problem, the solution can be so powerful that it is hard to accept at first. Only a small number of early adopters embrace brand-new technologies: a short course of antibiotics instead of surgery, Amazon delivering an enormous array of goods to your door overnight, Netflix providing on-demand movies and programs at the click of a button, and Expedia aggregating airlines into one easy-to-view list. Each of these now-familiar solutions applied digital technology to a problem and eventually redefined its industry. Today these are commonly accepted tools that we take for granted *because they work better than what came before*.

For a deeper dive into how AB's technology-enabled active bond investing can benefit your practice and your clients, and for more on how to use this approach to stimulate referrals from centers of influence, talk to your AB Regional Manager.

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INVESTMENT RISKS TO CONSIDER

The value of an investment can go down as well as up and investors may not get back the full amount they invested. Capital is at risk. Past performance does not guarantee future results.

Important Information

Market Risk: The market values of the portfolio's holdings rise and fall from day to day, so investments may lose value. **Interest Rate Risk:** Fixed-income securities may lose value if interest rates rise or fall—long-term securities tend to rise and fall more than short-term securities. The values of mortgage-related and asset-backed securities are particularly sensitive to changes in interest rates due to prepayment risk. **Credit Risk:** A bond's credit rating reflects the issuer's ability to make timely payments of interest or principal—the lower the rating, the higher the risk of default. If the issuer's financial strength deteriorates, the issuer's rating may be lowered and the bond's value may decline. **Inflation Risk:** Prices for goods and services tend to rise over time, which may erode the purchasing power of investments. **Foreign (Non-US) Risk:** Investing in non-US securities may be more volatile because of political, regulatory, market and economic uncertainties associated with such securities. These risks are magnified in securities of emerging or developing markets.

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