

THE VANGUARD APPROACH

Municipal bond funds

Learn about Vanguard's hub-and-satellite approach and municipal bond team. Also, understand Vanguard's risk management process, and explore an overview of product offerings.

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Vanguard[®]

Who we are¹

- Vanguard Fixed Income Group manages more than \$1.3 trillion in assets.
- Those assets included \$161 billion in municipal bond funds and \$31 billion in municipal money market funds.
- A team-based approach uses the skills of a broad group that is directed by seasoned leaders. Our experienced municipal team of approximately 45 professionals includes portfolio managers, senior credit research analysts, research associates, and traders.

¹ Data as of December 31, 2018.

Overview: Funds and performance

Vanguard municipal bond funds

Money market		National		State-specific	
VMSXX* Municipal Money Market Fund	VCTXX* California Municipal Money Market Fund	VWSUX Short-Term Tax-Exempt Fund	VMLUX Limited-Term Tax-Exempt Fund	VCADX California Intermediate-Term Tax-Exempt Fund	VCLAX California Long-Term Tax-Exempt Fund
VNJXX* New Jersey Municipal Money Market Fund	VYFXX* New York Municipal Money Market Fund	VWIUX Intermediate-Term Tax-Exempt Fund	VWLUX Long-Term Tax-Exempt Fund	VNJUX New Jersey Long-Term Tax-Exempt Fund	VNYUX New York Long-Term Tax-Exempt Fund
VPTXX* Pennsylvania Municipal Money Market Fund		VWALX High-Yield Tax-Exempt Fund		VPALX Pennsylvania Long-Term Tax-Exempt Fund	VOHIX Ohio Long-Term Tax-Exempt Fund
			VTEB Tax-Exempt Bond ETF	VMATX Massachusetts Tax-Exempt Fund	

All ticker symbols for Admiral™ Shares, except for Massachusetts and Ohio, where only Investor Shares are available, and the money market funds.

*See page 9 for more information.

Expense ratio advantage—yield and quality

Our global scale and client-first culture give us the opportunity and impetus to keep costs low. This has resulted in an average asset-weighted expense ratio that is about one-fifth the industry average.² Vanguard's municipal bond funds are managed in the same manner. This cost advantage helps Vanguard's municipal bond funds provide competitive yields while delivering portfolios focused on high-quality, or investment-grade, securities. Because of our size, we also can trade at attractive prices to minimize the effect of transaction costs on fund performance.

² As of December 31, 2018, Vanguard's asset-weighted average expense ratio is 0.10% and the industry asset-weighted average expense ratio was 0.58%. Sources: Morningstar, Inc., and Vanguard. Industry average excludes Vanguard.

Consistent compelling returns

Percentage of Vanguard municipal bond funds whose returns beat their peer-group averages.³



³ Periods ended December 31, 2018.

Notes: For the one-year period, 22 of 22 Vanguard municipal bond funds outperformed their peer-group averages. For the three-year period, 22 of 22 Vanguard municipal bond funds outperformed their peer-group averages. For the five-year period, 22 of 22 Vanguard municipal bond funds outperformed their peer-group averages. For the ten-year period, 22 of 22 Vanguard municipal bond funds outperformed their peer-group averages. Results vary for other time periods. Only funds with a one-, three-, five-, and ten-year history were included in the comparison.

Note that the competitive performance data shown represent past performance, which is not a guarantee of future results, and that all investments are subject to risks. For the most recent performance, visit our website at vanguard.com/performance.

Source: Lipper, a Thomson Reuters Company.

This performance is influenced by our emphasis on the following diversified sources of alpha:

- Yield-curve positioning
- Rates structure
- Credit-quality allocation
- Security selection
- Sector allocation

Hub-and-satellite approach

The hub-and-satellite approach to managing the Vanguard Municipal Bond Funds allows for a team-oriented, consistent management process. This structure strives to produce superior investment results by combining satellite specializations with multiple, diversified sources of alpha, on a risk-controlled basis. The hub's goal is to provide a common operating framework through value-added strategic positioning, and it is composed of senior leaders of our investment management teams. The hub focuses on the strategic outlook and sets investment policies for the actively managed fixed income portfolios, including the macroeconomic outlook, duration and yield-curve positioning, credit-quality allocation, and broad sector-allocation weights versus the funds' benchmarks.



The satellites

Even though each of the Vanguard municipal bond funds has a portfolio manager responsible for oversight, the funds are managed through a team approach that combines the skills of 45 specialists.

Portfolio managers, traders, and credit and quantitative analysts are all assigned to a satellite team. Each satellite team conducts bottom-up research in its assigned area of bond valuation. The satellite teams are: Money markets, Rates, General obligation bond (G.O.) Tax-backed, Revenue, and Spread credit.

Satellite teams may include traders and analysts who specialize in particular sectors, quantitative analysts, and in-house counsel. The teams are led by a portfolio manager and a senior credit analyst.

The Money markets, G.O./Tax-backed, and Revenue teams evaluate sectors and issuers across 14 U.S. geographic regions. Each team member is assigned to cover certain sectors and large issuers.

Credits analysts first form an independent recommendation on each issuer, then discuss their rationale with their respective satellite teams and portfolio managers. Together they provide a final recommendation on whether to purchase bonds from a particular issuer, or whether to over or underweight certain issuers or sectors.

The Rates and Spread credit teams use market and quantitative valuation techniques. For example, the Rates team makes recommendations for bond duration, yield-curve positioning, and rate structures.

These teams can recommend investment themes based on macroeconomic factors. For example, a team may consider how a recession could affect a portfolio and recommend changes in advance of an economic downturn. Additionally, teams could consider a topical strategy, such as avoiding a troubled issuer like Puerto Rico or offering a long-term vision based on economic fundamentals. Those themes are ultimately implemented in the portfolio.

The portfolio managers, using parameters set by the hub, then construct assigned portfolios using recommendations from the satellite teams.

Generally, the system works as follows:

When a new issue is coming to market, credit analysts examine the creditworthiness of the issuer, assign a rating, and formulate an opinion if Vanguard should purchase. The credit analysts then work with a trader who is assigned to that particular sector to assess the market environment and determine a price at which the bonds could appear attractive to buy. Portfolio managers take a broader view and evaluate the bonds' structure, convexity, and risk premiums. They then overlay parameters and recommendations issued by the satellites on various factors, such as the future direction of interest rates, before determining where to allocate capital across each of our actively managed portfolios.

Credit research

Research is one of the main pillars of the investment process. Credit analysts, in particular, are the first line of defense in identifying problems and opportunities among any bond issues we own or are considering. Their research leads them to develop opinions— independent of the rating agencies—that are used in conjunction with the bond traders' knowledge of market trends to determine appropriate prices for specific bonds.

With regard to the securities that are ultimately chosen for investment, a fund's credit analysts perform an objective, thorough, and independent analysis of the

issuers' overall creditworthiness. The research process may include analysis of an issuer's recent and historical financial statements, sensitivity testing on projected cash flows, discussions and meetings with officials from municipalities or other issuers and/or credit-rating agency analysts, and road-show presentations.

Certainly, we also look to the established credit-rating agencies for input. Published ratings can, after all, influence bond prices. But for each of the bonds we trade at Vanguard, we rely primarily on our own independent analysis. And that work doesn't end with the decision to buy; there is continual monitoring afterward to maintain an up-to-date opinion on the credit.

Hub team profile

The hub comprises the following seven investment leaders:

John W. Hollyer, CFA, is a principal and global head of Vanguard Fixed Income Group, which manages over \$1 trillion in assets. He is responsible for the group's portfolio management, strategy, credit research, trading, and planning functions. He joined the company in 1989 and previously served as head of the Risk Management Group, which focuses on global investment and operational risk issues for Vanguard Investment Management Group. Hollyer also served as portfolio manager for a number of Vanguard's bond and money market funds. Hollyer, who has nearly 30 years of investment management experience, is a CFA® charterholder and has a B.S. in economics from The Wharton School of the University of Pennsylvania.

Christopher W. Alwine, CFA, is a principal and global head of credit in Vanguard Fixed Income Group. Alwine joined Vanguard in 1990 and has more than 25 years of investment experience. Alwine has served in multiple roles throughout his career in Vanguard Fixed Income Group. His experience includes trading, portfolio management, and credit research. Alwine earned a bachelor of business administration from Temple University and an M.S. in finance from Drexel University. He holds the Chartered Financial Analyst® certification.

Joseph H. Davis, Ph.D., is a Vanguard principal and global head of the Investment Strategy Group, whose research and client-facing team develops asset allocation strategies and conducts research on the capital markets, the global economy, portfolio construction, and related investment topics. As Vanguard's global chief economist, Davis is also a key member of the senior portfolio management team for Vanguard Fixed Income Group. Davis earned his B.A. *summa cum laude* from Saint Joseph's University and his M.A. and Ph.D. in economics from Duke University.

Sara Devereux is a principal and global head of rates in Vanguard Fixed Income Group. Her team manages all active rates and money market portfolios and rates-related strategies across our active taxable fixed income franchise. This includes mortgages, agencies, governments, and Treasury Inflation-Protected Securities. She also oversees foreign exchange and derivatives-trading activities. Before joining Vanguard, Sara was a partner at Goldman Sachs, where she spent more than 20 years in mortgage-backed securities and structured product trading and sales. Earlier in her career, Sara worked at HSBC in risk management advisory and interest rate derivatives structuring. She started her career as an actuary at AXA Equitable Life Insurance. Sara earned a B.S. in mathematics from the University of North Carolina at Chapel Hill and an M.B.A. from the Wharton School of the University of Pennsylvania.

Manish Nagar, is a principal and head of the Risk Management Group, which focuses on global investment and operational risk issues for Vanguard Investment Management Group. Before this role, Nagar was global head of investment risk; prior to that, he was head of risk management in Europe, where he was responsible for investment and operational risk oversight of the U.K. and Irish fund range. Nagar earned a bachelor's degree in electronics and communication engineering from Bangalore University, in India, and an M.B.A. from Rutgers University, in the United States.

Paul Malloy, CFA, is head of municipal investment at Vanguard. Previously, he was head of Vanguard Fixed Income Group, Europe. In this role, Malloy managed portfolios that invested in global fixed income assets. He also oversaw Vanguard's European Credit Research team. Malloy joined Vanguard in 2005 and the Fixed Income Group in 2007. He has held various portfolio management positions in Vanguard's offices in the United Kingdom and the United States. In past roles, he was responsible for managing Vanguard's U.S. fixed income ETFs as well as overseeing a range of fixed income index mutual funds. Malloy earned an M.B.A. in finance from the Wharton School of the University of Pennsylvania and a B.S. in economics and finance from Saint Francis University. He is a CFA charterholder.

Anne N. Mathias, CFA, is a senior strategist in Vanguard Fixed Income Group, with a focus on global macro rates and foreign currency. She is responsible for analyzing interest rates, currency valuations, economic developments, and political risks for Vanguard's portfolio managers and investment staff. Mathias earned a B.A. from the University of Maryland and an M.S. in international affairs from Georgetown University's School of Foreign Service. She is a CFA charterholder and a member of the CFA Society of Los Angeles and the CFA Institute.

As one of the largest municipal fund managers in the marketplace, Vanguard has developed strong relationships with credit-rating agencies and individual issuers. Vanguard's credit research team uses unaudited versions of municipal financial statements in addition to the official audited releases. This allows us to begin our credit research before the release of the audited documents, which are not as timely. The team also uses other public documents to construct a view on any given issuer. Ultimately, an issuer is not added to a portfolio until the team has developed a comfort level based on multiple inputs.

The research team is aligned in a matrix structure, with sector and state-specific responsibilities. For example, while one credit analyst covers Ohio, a different analyst may be responsible for public power bonds in the Midwest. With this structure, several senior analysts and associates may review a new issue coming to market. This team approach ensures consistency in exposure across similar portfolios as well as continuity in the case of personnel turnover.

Stability in the team structure and composition is critical to ensure consistent management of these funds. Vanguard's senior municipal credit analysts average 10 years at Vanguard and more than 15 years of industry experience. Vanguard strives to achieve a balance between internally developed talent and externally hired experts with extensive backgrounds of covering municipal issuers.

Life of a trade

Managing bond funds at Vanguard is team-oriented and dynamic. The portfolio managers and traders share the same desks and communicate through both formal meetings and informal discussions.

The entire team understands the targeted duration, convexity, and yield-curve positioning, and, through formal meetings, it decides what sectors are attractive to underweight or overweight. Both portfolio managers and traders are on the phone with counterparties, discussing offers and bids.

Through participation on satellite teams, traders look for bonds that are deemed attractive, for example, an A-rated hospital issuer. As the trader with coverage in hospitals locates issues he or she feels would benefit a portfolio manager, the trader presents the idea to the portfolio manager to engage in a dialogue surrounding

the overall impact of the issue on the fund's duration and credit profile. Because the traders have sector and region coverage, they have a strong understanding of what issues are offered and at what prices.

The portfolio manager trades bonds to change the positioning of the fund to the desired profile, and once realized, trades take place to optimize portfolio characteristics, such as convexity or call dates. Besides understanding the needs of his or her own funds, each portfolio manager is aware of what types of bonds other portfolio managers are looking for. In the example of the A-rated hospital issuer, if it doesn't fit the manager's needs, he or she may suggest the trader present the idea to other managers, who may decide to work together and divide the issue among several funds.

So while the fixed income team is compartmentalized through separate roles for portfolio manager, trader, and analyst, there is continuous dialogue among the team members as issuers are evaluated and trades are executed.

Understanding Vanguard Municipal Bond Funds and their benchmarks

The Vanguard Municipal Bond Funds are designed to provide investors with style-pure exposure to the municipal bond market. The actively managed municipal bond funds do not attempt to replicate their benchmarks' holdings. While the Barclays municipal benchmarks have proved to be a reasonable barometer for comparing fund performance and positioning, Vanguard manages the portfolios relative to proprietary custom indexes that were created to represent the maturity distribution of our funds and practical ownership considerations (for example, the need to maintain liquid positions to meet shareholder transaction activity).

Because of the structural differences (liquidity, issuer size) in how we manage the municipal funds versus the Bloomberg Barclays benchmarks, we believe that clients should employ multiple lenses to evaluate the funds. This would include reviewing a fund's performance versus the performance of its benchmark, large competitors, and the average Lipper peer. Further, understanding the differences in philosophy and positioning is necessary since investment styles—particularly for high-quality versus low-quality bonds—oscillate between being in and out of favor.

Liquidity

Liquidity can change quickly and will be driven by investors' perception of investment value. Postcrisis regulations have lowered dealers' return on capital and worsened the risk/reward ratio for actively trading bonds. Dealers will hesitate to commit capital when their profit potential is limited because of tight bid-offer spreads, but they will become more active when valuations cheapen and bid-offer spreads widen.

Vanguard Fixed Income Group has a long history of maintaining liquidity reserves in its municipal bond funds. We view liquidity management as a core responsibility of portfolio managers that requires careful thought and a well-designed plan before a challenging event occurs.

Vanguard's liquidity management involves six critical components:

1. **Market analysis.** We assess the underlying liquidity and the projected rate of outflows for each product type.
2. **Investor analysis.** We estimate projected redemptions for each fund and client channel.
3. **Dealer relationships.** Strong ties with dealers help us gain access to securities in stressed markets and minimize market-impact costs during dislocations.
4. **Robust policies and controls.** We require all large transactions to have a one-year commitment and clients must prenotify us of large trades. In addition, we have a frequent-trading policy that reduces turnover rates. Moreover, we produce intraday cash reports every 30 minutes as we monitor our liquidity position.
5. **Portfolio construction with strategic reserves.** Vanguard has three reserve tiers: Tier 1 is cash (up to 4% of the portfolio); Tier 2 is very high-quality, noncallable bonds with less than 5 years stated maturity (up to 4%); and Tier 3 is very high-quality, generic structures with greater than 5 years stated maturity (greater than 10%). These tiers are composed of only highly liquid securities.
6. **Provisions for exceptional circumstances.** Vanguard may conduct interfund lending, and it holds a line of credit with a consortium of banks that can provide additional liquidity tools.

Risk management strategies

With individual investors holding a large share of the municipal market, the muni investor base tends to be more homogeneous than that of other fixed income sectors. Muni investors are generally more conservative and look to municipal bonds for capital preservation, for municipal income, and as a portfolio stabilizer and diversifier. This homogeneity makes the muni market more prone to short-run volatility. Because of the thinner muni market liquidity and the tendency for trading to lean in one direction, individuals reacting to headlines or short-term price movements can create imbalances in the market that may cause bonds to overshoot toward cheap or rich levels on a relatively short-term basis. This is one reason we recommend to our clients that they tune out short-term noise and maintain balance, diversification, and a long-term perspective when investing.

While the municipal bond investor tends to be fairly homogeneous, the market itself—the securities—is heterogeneous and, therefore, should not be painted with broad strokes. There are roughly \$3.8 trillion in assets and more than 80,000 issuers. A majority of the market is high-quality, AA-rated or above by S&P and Aa3 or above by Moody's, with only a small percentage of the universe rated below investment grade.⁵

The fiscal mismanagement that led to various bankruptcy filings (San Bernardino, Vallejo, and Detroit) over the past few years, and the recent default by Puerto Rico, occurred over long periods of time. Bankruptcy filings and defaults are typically predictable because these entities have been in trouble for years, if not decades. Municipal credit quality will continue to be at the top of investor concerns as states such as Illinois and New Jersey, and cities such as Chicago, struggle to make pension payments and fulfill other obligations.

Our active managers will continue to work to avoid credit-related losses on bonds for issuers that face dire circumstances. For example, bonds issued by Puerto Rico and its agencies were almost eliminated from our funds well in advance of the problems reaching crisis level there. Vanguard prefers to side with caution when it comes to less creditworthy issuers. Nonetheless, certain bonds may be attractive because of their price, the presence of default insurance, a dedicated revenue stream, or legal guarantees.

⁵ Investment-grade bonds are those rated BBB– or Baa or higher by credit-rating agencies.

Investors should remember that municipal defaults remain rare. *Governing* magazine reported that only 13 cities or towns (about 0.06%) declared bankruptcy between 2008 and 2013.⁶ There is the potential that bankruptcy filings could increase more than in the past, but we think the risk of a substantial increase in filings remains very low.

Vanguard manages the risk of a ratings downgrade to any specific issuer by limiting the overall exposure at the complex and fund level. Specifically, risk in our funds is mitigated through broad diversification, with no more than 5% invested in one issuer for our active national municipal mutual funds. Furthermore, about 70% of the funds are invested in AA-rated debt or better. Most important, Vanguard relies on the credit research team to carefully analyze municipal bonds both before and after their purchase by a fund. Because of the team’s diligence, we would not be a forced seller of the debt we own if the economic situation of a state or municipality were to result in downgrades of any of the fund’s holdings. The credit analyst team, together with portfolio managers and traders, would evaluate the situation and determine an appropriate course of action.

To provide style-pure exposure to the market, Vanguard does not attempt to move the duration of its funds significantly from that of the benchmark, allowing investors to adjust their duration profiles based on their own risk tolerance and goals. As an example, our funds’ duration exposures generally fall within 0.5 year of their internal benchmarks.

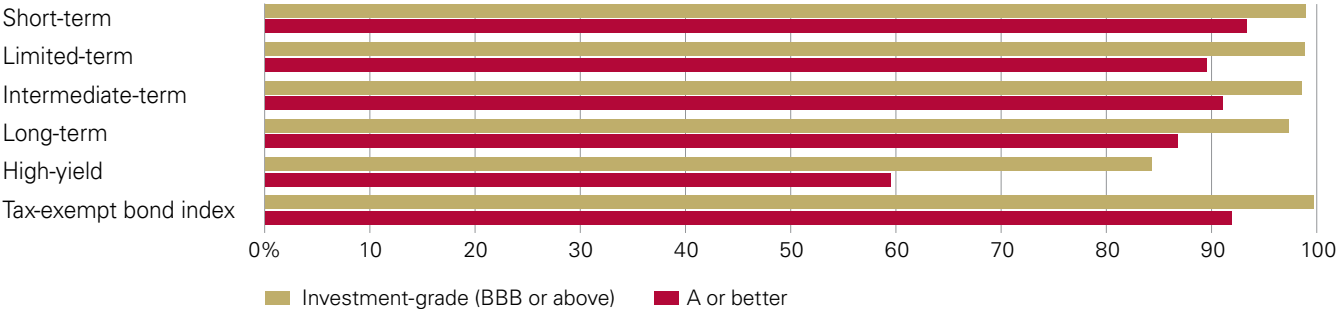
The management team is supported by Vanguard Risk Management Group (RMG), which seeks to proactively add value to the investment process by working in concert with the Fixed Income Group.

RMG is responsible for managing the internal benchmarks of the municipal funds, defining and reporting on the municipal investment risk framework, and performance attribution. As mentioned earlier, the internal custom benchmarks were created to reflect the funds’ investable universe by making adjustments to the public benchmark for liquidity and maturity. In addition, the benchmarks employ issuer capping to ensure they meet IRS diversification requirements. RMG produces daily reports to assess a fund’s liquidity versus its target liquidity, as well as its various risk factors versus those of the benchmark. These include issuer concentration, duration, yield-curve positioning, credit allocation, and projected tracking error. RMG meets monthly with the members of the hub to review fund risk positioning and performance attribution, the primary feedback loop that explains how portfolio construction decisions affect fund performance.

Other considerations, such as tax management, derivative exposure, and securities lending, differentiate the Vanguard municipal bond funds. The portfolio managers are sensitive to minimizing capital gains distributions, but their first priority is maximizing returns for shareholders. With the exception of the muni money market portfolios and Vanguard High-Yield Tax-Exempt Fund, there is no exposure to alternative minimum tax (AMT) private activity bonds. In the funds, the derivative exposure is typically limited to U.S. Treasury futures, which are used for duration management and are less than 20% of assets. In the money market funds, the derivative exposure is typically limited to tender option bonds. The funds do not participate in securities lending.

⁶ Mike Maciag, 2013. How rare are municipal bankruptcies? *Governing*. Accessed June 6, 2018, at <http://www.governing.com/blogs/by-the-numbers/municipal-bankruptcy-rate-and-state-law-limitations.html>.

Credit ratings of Vanguard municipal bond funds’ holdings



Note: Data as of December 31, 2018, for Admiral™ Shares.
Source: Vanguard.

Product overviews

Vanguard emphasizes credit quality and municipal income in its six national and seven state-specific municipal bond funds. All Vanguard municipal funds keep the vast majority of their holdings in investment-grade bonds. Four of the actively managed municipal national funds—the short-term, limited-term, intermediate-term, and long-term funds—hold 95% of their assets in investment-grade bonds. The High-Yield Tax-Exempt Fund invests 80% of its assets in investment-grade bonds. Vanguard Tax-Exempt Bond Index Fund is not actively managed, but it is focused on investment-grade bonds, and it tracks an investment-grade index. Further details about our products are below: (All data as of September 30, 2019, except for the expense ratio, which is as of the most recent prospectus.)

Vanguard Short-Term Tax-Exempt Fund

The fund seeks to provide a higher return than money markets with limited price volatility. The fund is managed with a duration profile between 1.0 and 1.5 years. The fund is structurally biased toward securities with shorter maturities compared with its benchmark, which only includes securities with maturities between 1 and 2 years. About 40% to 50% of the holdings have maturities of less than 1 year, approximately 15% to 30% overlap the benchmark's yield-curve exposure, and the remaining portion is invested primarily in securities with maturities between 2 and 5 years.

Admiral Shares ticker	VWSUX
Benchmark	Bloomberg Barclays 1 Year Municipal Bond Index
Expense ratio	0.09%
Total net assets	\$16.8 billion
Number of bonds	2,612
Average duration	1.1 year
Inception date	
Admiral Shares	February 12, 2001
Investor Shares	September 1, 1977

Portfolio manager: Justin A. Schwartz, CFA, head of Vanguard's municipal money market funds

- Has managed the fund since February 2016 and has been with Vanguard since 2004.
- B.S. in finance and marketing from the University of Richmond's Robins School of Business and is a CFA charterholder.

Vanguard Limited-Term Tax-Exempt Fund

The fund seeks to provide investors access to high-quality short-term municipal bonds. The fund is managed with a duration profile between 2 and 3 years. About 20% to 30% of the fund's holdings have maturities less than 1 year, approximately 50% of the holdings overlap the benchmark's 1–5 year credit exposure, and the remaining portion is largely invested in maturities between 5 and 7 years.

Admiral Shares ticker	VMLUX
Benchmark	Bloomberg Barclays 1–5 Year Municipal Bond Index
Expense ratio	0.09%
Total net assets	\$28.8 billion
Number of bonds	5,771
Average duration	2.5 years
Inception date	
Admiral Shares	February 12, 2001
Investor Shares	August 31, 1987

Portfolio manager: Adam M. Ferguson, CFA

- Has managed the fund since 2017 and has worked in investment management since 2004.
- B.S., Wilmington University, and is a CFA charterholder.

Vanguard Intermediate-Term Tax-Exempt Fund

The fund seeks to provide high-quality core exposure to the municipal bond market, balancing income and interest rate risk. The fund is managed with a duration profile between 4 and 6 years. About 10% of the fund is invested in high-quality short-term issues to serve as a liquidity bucket, with the majority of the portfolio's holdings having maturities between 5 and 20 years.

Admiral Shares ticker	VWIUX
Benchmark	Bloomberg Barclays 1–15 Year Municipal Bond Index
Expense ratio	0.09%
Total net assets	\$70.6 billion
Number of bonds	9,144
Average duration	4.7 years
Inception date Admiral Shares Investor Shares	February 12, 2001 September 1, 1977

Portfolio manager: **James M. D'Arcy, CFA**

- Has managed the fund since 2013 and has worked in investment management since 1996.
- B.A., University of Colorado, and is a CFA charterholder.

Vanguard Long-Term Tax-Exempt Fund

The fund seeks to provide absolute return through exposure to high-quality long-term municipal bonds. The fund is managed with a duration profile between 6 and 8 years. About 10% of the fund's holdings are invested in high-quality short-term issues to serve as a liquidity bucket. In general, the fund holds about one-third of its assets in bonds with maturities greater than 20 years.

Admiral Shares ticker	VWLUX
Benchmark	Bloomberg Barclays Municipal Bond Index
Expense ratio	0.09%
Total net assets	\$12.7 billion
Number of bonds	2,084
Average duration	5.9 years
Inception date Admiral Shares Investor Shares	February 12, 2001 September 1, 1977

Portfolio manager: **Mathew M. Kiselak, principal and head of the municipal bond desk**

- Has managed the fund since 2010 and has worked in investment management since 1987.
- B.A., Pace University.

Vanguard High-Yield Tax-Exempt Fund

The fund seeks to provide a high level of income to investors by investing in securities of lower credit quality. The fund is managed with a duration profile between 6 and 8 years. About 10% of the fund's holdings are invested in high-quality short-term issues to serve as a liquidity bucket. In general, the fund holds about one-third of its assets in bonds with maturities greater than 20 years. The fund's positioning is consistent with that of the Long-Term Tax-Exempt Fund in most ways with two exceptions: It has a bias toward lower-quality investment-grade (Baa-rated) and below-investment-grade (those rated Ba and lower) issuers, and it can hold up to 20% in private activity bonds (the Long-Term Tax-Exempt Fund does not own such bonds).

Admiral Shares ticker	VWALX
Benchmark	Bloomberg Barclays Municipal Bond Index
Expense ratio	0.09%
Total net assets	\$15.9 billion
Number of bonds	2,565
Average duration	6.0 years
Inception date	
Admiral Shares	November 12, 2001
Investor Shares	December 27, 1978

Portfolio manager: **Mathew M. Kiselak**, principal and head of the municipal bond desk

- Has managed the fund since 2010 and has worked in investment management since 1987.
- B.A., Pace University.

Vanguard Tax-Exempt Bond Fund

The fund seeks to track the S&P® National AMT-Free Municipal Bond Index, a broad, comprehensive, market-value-weighted index designed to measure the performance of the investment-grade, municipal bond market. Bonds issued by U.S. territories, including Puerto Rico, are excluded from this index.

ETF Shares ticker	VTEB (Admiral Shares ticker: VTEAX)
Benchmark	S&P® National AMT-Free Municipal Bond Index
Expense ratio	0.08% (both Admiral and ETF Shares)
Purchase fee	0.25% (for Admiral Shares)
Total net assets	\$5.9 billion
Number of bonds	4,243
Average duration	5.2 years
Admiral, ETF, and Investor Shares inception date	August 21, 2015

Portfolio manager: **Adam M. Ferguson, CFA**

- Has managed the fund since its inception in 2015 and has worked in investment management since 2004.
- B.S., Wilmington University, and is a CFA charterholder.

Vanguard state-specific portfolios

The state-specific municipal funds reflect the same risk factor exposures as the national municipal funds, after taking into account sector and quality differences driven by the concentrated nature of the universe. Vanguard California Intermediate-Term Tax-Exempt Fund is similar to Vanguard Intermediate-Term Tax-Exempt Fund, whereas the other state funds are similar to Vanguard Long-Term Tax-Exempt Fund. (All ticker symbols are for Admiral Shares, except for Massachusetts and Ohio, where only Investor Shares are available.)

- California Intermediate-Term Tax-Exempt Fund (VCADX)
- California Long-Term Tax-Exempt Fund (VCLAX)
- Massachusetts Tax-Exempt Fund (VMATX)
- New Jersey Long-Term Tax-Exempt Fund (VNJUX)
- New York Long-Term Tax-Exempt Fund (VNYUX)
- Ohio Long-Term Tax-Exempt Fund (VOHIX)
- Pennsylvania Long-Term Tax-Exempt Fund (VPALX)

Vanguard money market portfolios

(Investor Shares only)

- Municipal Money Market Fund (VMSXX)*
- California Municipal Money Market Fund (VCTXX)*
- New Jersey Municipal Money Market Fund (VNJXX)*
- New York Municipal Money Market Fund (VYFXX)*
- Pennsylvania Municipal Money Market Fund (VPTXX)*

***The Fund is only available to retail investors (natural persons). You could lose money by investing in the Fund. Although the Fund seeks to preserve the value of your investment at \$1.00 per share, it cannot guarantee it will do so. The Fund may impose a fee upon sale of your shares or may temporarily suspend your ability to sell shares if the Fund's liquidity falls below required minimums because of market conditions or other factors. An investment in the Fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The Fund's sponsor has no legal obligation to provide financial support to the Fund, and you should not expect that the sponsor will provide financial support to the Fund at any time.**



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For more information about Vanguard funds or Vanguard ETFs, visit our website or call 800-997-2798 to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information are contained in the prospectus; read and consider it carefully before investing.

Vanguard ETF Shares are not redeemable with the issuing Fund other than in very large aggregations worth millions of dollars. Instead, investors must buy and sell Vanguard ETF Shares in the secondary market and hold those shares in a brokerage account. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

All investing is subject to risk, including possible loss of principal.

Past performance is no guarantee of future returns.

Bond funds are subject to interest rate risk, which is the chance bond prices overall will decline because of rising interest rates, and credit risk, which is the chance a bond issuer will fail to pay interest and principal in a timely manner or that negative perceptions of the issuer's ability to make such payments will cause the price of that bond to decline. High-yield bonds generally have medium- and lower-range credit-quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit-quality ratings.

Although the income from a municipal bond fund is exempt from federal tax, you may owe taxes on any capital gains realized through the fund's trading or through your own redemption of shares. For some investors, a portion of the fund's income may be subject to state and local taxes, as well as to the federal Alternative Minimum Tax.

Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility.

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