2022 Robo-Advisor Landscape

Our take on the digital advice industry and the best options for individual investors.

Morningstar Manager Research
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Executive Summary

This industry landscape report evaluates 16 leading robo-advisors while providing data on up to 20. It focuses on the features and benefits that are most likely to help investors reach their financial goals: fees, quality of investment advice, financial planning tools, and other factors.

Our research found broad similarities among major retail-oriented U.S. digital advice providers in investor engagement and advice delivery. Nearly all start with a basic questionnaire geared toward understanding investors' goals, time horizons, and risk tolerance. The advice engine uses that information to pair investors with one of several portfolio options, typically consisting of low-cost, passively managed funds.

Providers differ more in how much they help with other aspects of financial planning. Most focus on digital investment management and add some basic features, but the top advice-oriented providers offer fairly comprehensive planning tools, ranging from online-only counsel to on-demand access to human financial advisors.

Cost is another key differentiator. The median advisory fee among robo-advisors we surveyed was 0.30% of assets per year—making them significantly cheaper than traditional financial advisors' typical 1% levy. But specific fee levels and how they are charged vary. The optimal fee structure depends on how much money clients invest and whether they want basic investment advice or more-comprehensive financial planning.

Of the 16 robo-advisors we evaluated, Vanguard and Betterment ranked first and second, respectively, thanks to their low costs, nuanced asset-allocation approaches, broad range of financial planning tools, and transparency. Titan and several wirehouse-affiliated providers were the least attractive, in our view, because of higher costs, poor transparency, and/or limited financial planning tools.

Key Takeaways

- Despite its growth potential, the digital advice industry still accounts for a small percentage of investable assets in the United States.
- Dedicated digital advice firms often struggle to reach profitable scale, while the large brokerage firms and wealth managers that acquire them often struggle to integrate their digital advice capabilities.

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- The typical robo-advisor playbook includes portfolios composed of passively managed, low-cost exchange-traded funds with a range of risk levels. But asset-allocation ranges vary, and many providers add quasi-active strategies, such as factor tilts, strategic beta, and direct indexing.
- Transparency can be an issue as robo-advisors often fail to provide prospective clients with basic data about portfolio holdings and asset-allocation percentages.
- Given their low required account balances, modest costs, and ease of use, robo-advisors are a compelling option for young investors with less complicated financial situations.
- Our assessments prioritized low, transparent fees; a robust risk-tolerance questionnaire; logical mapping to portfolios; sound portfolio diversification that steers clear of questionable asset classes and investment tactics; and a solid range of planning-related features.
- Betterment and Vanguard stood out as the best options, although we also assigned above-average scores to Fidelity Go, Schwab Intelligent Portfolios, SigFig, and Wealthfront.
- Titan Invest, E-Trade Core Portfolios, Merrill Edge Guided Investing, Morgan Stanley Access Investing, UBS Advice Advantage, and Wells Fargo Intuitive Investor scored poorly because of higher costs, limited planning features, and/or a lack of transparency.

Introduction

The robo-advisor industry is more than a quarter century in the making, but it remains a story of untapped potential, both for digital advice providers and the investors who stand to benefit. Indeed, industrywide assets of around $440 billion at year-end 2020 made up only a small fraction of the then-$27.9 trillion U.S. retail market, which Cerulli Associates defines as investors with $100,000 to $5 million of financial assets. Meanwhile, even as access to low-cost portfolios diversified by asset class and region has become the norm, leading robo-advisor providers have only recently added basic features, such as nonretirement goal planning, and formerly sophisticated services like tax-loss harvesting aren't standard yet.

As robo-advisors compete for new business by adding investing and planning capabilities, it can be hard to discern which ones are topnotch. Varied pricing models and often poor transparency into underlying investments, where conflicts of interest and outsize risks can lurk, complicate matters further.

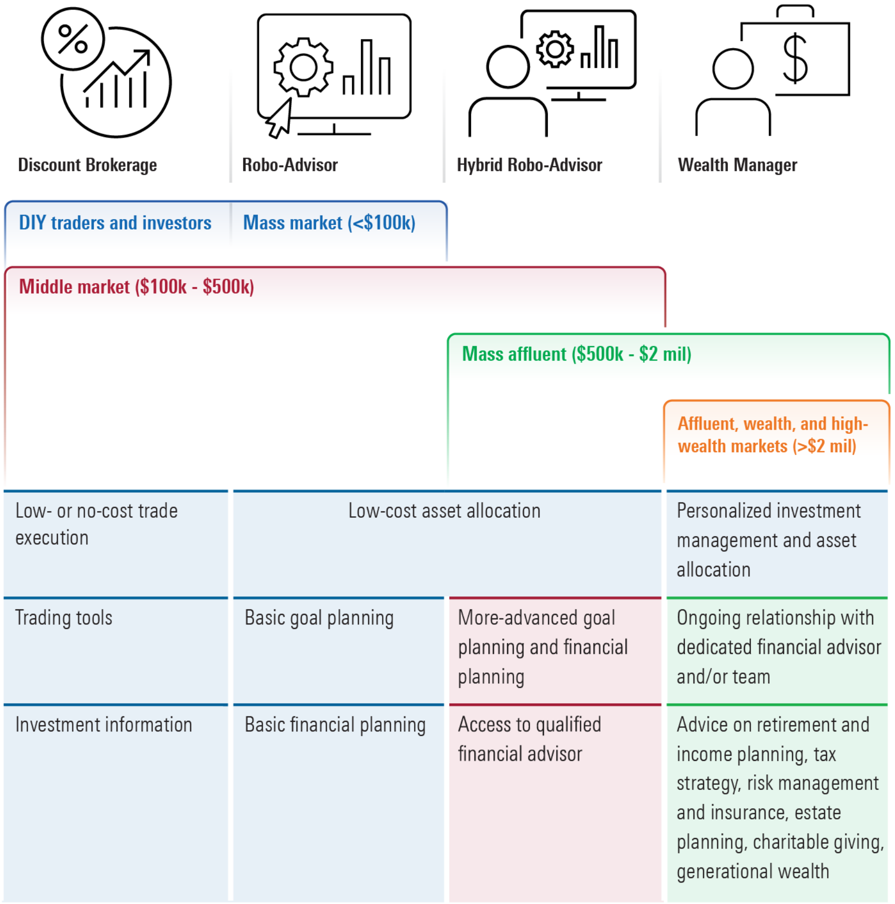
This paper surveys the industry landscape and assesses 16 major robo-advisor providers. Two stand out across the board for the quality of their portfolio construction and extensive planning tools. We consider four others above average, and some competitors aren't far behind. Several offerings, though, warrant caution, mainly because of above-average costs and/or transparency issues.

Definition

The birth of robo-advisors reflects the confluence of many trends, including the growth of the internet, the surge in popularity of ETFs and other low-cost investment options, the waning of defined-benefit pension plans, generally rising investor affluence, and a flood of private equity assets looking for disruptive players in financial technology. At the risk of oversimplifying, though, robo-advisors are the offspring of the marriage between Modern Portfolio Theory and advanced computing power. In fact, Nobel laureate William Sharpe, one of the fathers of the capital asset pricing model, founded in 1996 what would emerge as the first robo-advisor, Financial Engines. Initially an online advice provider whose recommendations investors had to implement on their own, the firm became a robo-advisor once it launched computer-based discretionary asset management.

Such algorithmic asset management is what separates robo-advisors from do-it-yourself trading platforms and advice providers, on the one hand, and higher touch, personalized wealth management, on the other. Morningstar's Michael Wong defines robo-advisors as platforms that offer automated, semitailored strategic asset-allocation investment portfolios directly to retail end customers.[1] Additional services and financial planning tools are common as is some degree of access to human advisors, the "robo" or "robot" moniker notwithstanding.

Exhibit 1 Robo-Advisors Fill Niche Between Discount Brokers and Traditional Wealth Management



	Discount Brokerage	Robo-Advisor	Hybrid Robo-Advisor	Wealth Manager
Clients	DIY traders and investors Middle market ($100k - $500k)	Mass market (<$100k)	Mass affluent ($500k - $2 mil)	Affluent, wealth, and high-wealth markets (>$2 mil)
Service	Low- or no-cost trade execution	Low-cost asset allocation		Personalized investment management and asset allocation
Tools	Trading tools	Basic goal planning	More-advanced goal planning and financial planning	Ongoing relationship with dedicated financial advisor and/or team
Benefits	Investment information	Basic financial planning	Access to qualified financial advisor	Advice on retirement and income planning, tax strategy, risk management and insurance, estate planning, charitable giving, generational wealth

Wealth tiers of mass market, middle market, and so on are based on research from Cerulli Associates.

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[1] Wong, M.W. 2015. "Hungry Robo-Advisors Are Eyeing Wealth Management Assets? We Believe Wealth Management Moats Can Repel the Fiber-Clad Legion." P. 2.

Scope

This research focuses on U.S.-based robo-advisors that are widely available to individual investors and excludes those limited to retirement assets. While it gives information on up to 20 providers, it assesses only 16. We didn't assess Capital One Investing (formerly United Income) and Ellevest because of Morningstar's previous and current ownership stakes in those firms. We also omitted J.P. Morgan Automated Investing from our assessments because some of the funds in which it invests track Morningstar indexes. However, while some of Betterment's sustainability-focused portfolios include three ETFs tracking Morningstar indexes, we did evaluate this robo-advisor because assets allocated to those funds accounted for a small fraction of total assets as of Dec. 31, 2021.

Our assessments draw on a combination of regulatory filings and online information, along with additional insights from robo-advisors' survey responses, follow-up interviews, and product demonstrations. In some cases, providers declined our survey request or would not grant an interview, but we proceeded with publicly available information, albeit with some adjustments for insufficient data (detailed below).

Methodology

We based our assessments on the factors most likely to help investors succeed. Our methodology draws on the Morningstar Analyst Rating for funds and other evaluations, such as our 529 college savings account and health savings account research, but it is tailored to robo-advisors.

Our assessments prioritized low, transparent fees; a robust risk-tolerance questionnaire; logical mapping to portfolios; sound portfolio diversification that steers clear of questionable asset classes and investment tactics; and a broad range of planning-related features.

We scored robo-advisors on a five-point scale along four dimensions: total price (30% weighting); the process used to select investments, construct portfolios, and match portfolios with investors (30%); the parent organization behind the digital platform (20%); and breadth of services (20%). We summed each weighted component to arrive at an overall score, which we then used to rank the robo-advisors.

Since information about the risk levels, asset mixes, and underlying funds is essential for consumers to make an informed decision before signing up, we assigned each provider that fell short a Quality of Investments/Portfolio Construction score of one out of five. The providers penalized for insufficient disclosure were E-Trade Core Portfolios, UBS Advice Advantage, and Wells Fargo Intuitive Investor.

Exhibit 2 Morningstar's Robo-Advisor Assessment Criteria

Category	Weighting %
Price	30
Quality of Investments/Portfolio Construction	30
Parent	20
Breadth of Services	20

Source: Morningstar. Data as of March 31, 2022.

Key assumptions and questions related to each of the four categories include:

Price (30%)

- Assumption:
    - All else being equal, lower fees are better, but we also looked for transparency and pricing models that align with investors' interests.
- Questions:
    - What is the total annual cost (including underlying fund expense ratios) for an account with a $15,000 balance, assuming no market fluctuations, and how does that cost change at smaller and larger asset levels?
    - Aside from asset-based fees, what other means does the platform use to monetize client assets and/or the client relationship?
    - What role, if any, do fee waivers play?

Quality of Investments/Portfolio Construction (30%)

- Assumption:
    - A seasoned team with strong resources selects investments and constructs portfolios that emphasize client results over sales of questionable proprietary products that do not align with investors' interests.
- Questions:
    - Who is in charge, and what are their qualifications?
    - Does the team select quality investments across a range of proven asset classes to build and maintain portfolios with sensible allocations?
    - How does the platform collect client-specific information on risk tolerance and other factors, and how does that information influence portfolio construction?
    - What drives investment changes?

Parent (20%)

- Assumption:
    - The organization behind the robo-advisor is aligned with clients while demonstrating a thoughtful approach, long-term commitment, and a track record of doing right by investors.
- Questions:
    - Are topnotch investment research leaders in charge of the platform?
    - Does the platform stand on its own, or is it integrated into the firm's broader suite of offerings?
    - Are there potential conflicts between the ultimate owners of the firm and its clients?
    - Have there been any regulatory missteps or other red flags?

Breadth of Services (20%)

- Assumption:
    - Tools and services support holistic financial planning for varied investing goals.
- Questions:
    - What is the breadth of investing and planning features available on the platform?
    - Does the program include key features, such as account aggregation, tax-loss harvesting, and planning for multiple goals?
    - Do tools and services consider investors' total assets and tax situation?
    - Do investors have access to humans, especially qualified financial professionals?

How This Report Is Organized

We have organized the rest of this report into two sections. The first provides the results of our research and a summary of each robo-advisor we assessed. The second addresses various topics relevant to robo-advisors: industry trends, pricing, risk-tolerance questionnaires, portfolio construction, financial planning services, program features and benefits, as well as a comparison of robo-advisors and traditional financial advisors.

Results: Vanguard Tops the List, but Betterment Is Not Far Behind

Vanguard Digital Advisor, and its premium sibling, Vanguard Personal Advisor Services, was the only program to receive a High overall assessment, while Betterment, Fidelity, Schwab, SigFig, and Wealthfront each came in at Above Average.

Vanguard didn't receive the top mark in every category. None of the offerings had a High assessment in Quality of Investment/Portfolio Construction, for example. It was hard to stand out in this category as most robo-advisors use low-cost ETFs from either Vanguard or iShares and rely on standard risk tiers (conservative, moderate, moderate growth, growth, aggressive) with a diversified mix of stocks, bonds, and cash. Because this overall approach is sound, we consider it a baseline expectation for the type of portfolios robo-advisors should provide.

Vanguard did, however, set itself apart on Price as the only robo-advisor with a High category assessment. At 0.20% per year for advisory and underlying fund fees, Vanguard Digital Advisor isn't the cheapest entry-level offering, but it is most likely to serve new investors well for its cost in relation to value. The same is true of Vanguard Personal Advisor Services for those with more-complicated needs or preferences. Its advisory fee starts at 0.30%, which is relatively cheap for a higher-end service that combines automated features with human financial advisors.

Although Schwab Intelligent Portfolios and SoFi Wealth appear to be bargains, concerns about each led to Above Average and Average Price assessments, respectively. Schwab Intelligent Portfolios comes with no advisory fee for accounts with at least $5,000 but allocates a significant portion of client assets to low-yielding, in-house cash accounts. That drags on returns in up markets while generating revenue for Schwab, which receives the spread (or difference) between the revenue it earns on asset balances and the yield it pays investors.

SoFi Wealth will be hard-pressed to maintain its current pricing, and it suffers from other weaknesses. SoFi charges no advisory fee and has waived the expense ratios for its two proprietary funds that together make up nearly two thirds of each portfolio’s equity allocation. The service, however, seems as much designed for monetization through cross-selling as for serving investment needs. Meanwhile, its two SoFi ETFs track growth benchmarks, which could create opportunity costs if value stocks continue to regain popularity.

These concerns regarding Schwab and SoFi illustrate the importance of Parent considerations and in this category, too, Vanguard receives the only High assessment. Owned by its U.S. funds and indirectly their shareholders, Vanguard has historically provided them with strong investment options for fees that keep dropping as the firm grows. Its advice business has become increasingly central to its growth plans, and Vanguard continues to add robo-advisor capabilities while hiring advice personnel.

Still, the one category in which competitors have a current edge on Vanguard is Breadth of Services. Here, Betterment and Schwab have the only High assessments. They both include key features that Vanguard also has, such as aggregation of outside accounts and access to certified financial planners, but Betterment and Schwab distinguish themselves by including tax-loss harvesting as well. Overall, Betterment ranks second on our list.

Exhibit 3 Morningstar's Robo-Advisor Assessments

Provider	Price[1]	Score	Quality of Investments/ Portfolio Construction	Score	Parent	Score	Breadth of Services	Score	Overall	Score
Acorns	Above Average	4	Average	3	Average	3	Below Average	2	Average	3.1
Ally Invest	Average	3	Average	3	Average	3	Average	3	Average	3.0
Betterment/Betterment Premium	Above Average	4	Above Average	4	Average	3	High	5	Above Average	4.0
E-Trade Core Portfolios	Average	3	Insufficient Data	1	Average	3	Low	1	Below Average	2.0
Fidelity Go/ Fidelity Personalized Planning & Advice	Average	3	Above Average	4	Above Average	4	Average	3	Above Average	3.5
Marcus Invest	Average	3	Average	3	Average	3	Below Average	2	Average	2.8
Merrill Edge Guided Investing	Below Average	2	Average	3	Average	3	Low	1	Below Average	2.3
Morgan Stanley Access Investing	Below Average	2	Low	1	Below Average	2	Below Average	2	Below Average	1.7
Schwab Intelligent Portfolios/ Schwab Intelligent Portfolios Premium	Above Average	4	Below Average	2	Above Average	4	High	5	Above Average	3.6
SigFig	Above Average	4	Above Average	4	Below Average	2	Above Average	4	Above Average	3.6
SoFi Wealth	Average	3	Below Average	2	Below Average	2	Average	3	Average	2.5
Titan	Low	1	Low	1	Low	1	Low	1	Low	1.0
UBS Advice Advantage	Low	1	Insufficient Data	1	Average	3	Below Average	2	Below Average	1.6
Vanguard Digital Advisor/ Vanguard Personal Advisor Services	High	5	Above Average	4	High	5	Above Average	4	High	4.5
Wealthfront	Above Average	4	Average	3	Average	3	Above Average	4	Above Average	3.5
Wells Fargo Intuitive Investor	Average	3	Insufficient Data	1	Average	3	Average	3	Below Average	2.4

Source: Morningstar. Data as of March 31, 2022.
1. High and Above Average Price ratings indicate more-modest and thus attractive fees, while Low and Below Average signify the opposite.
X Insufficient portfolio data resulted in a score of 1.
NR Not Rated

To facilitate further comparison between the 16 robo-advisor offers we evaluated, we provide a brief overview of each, arranged alphabetically below.

Acorns | Average

Partially owned by BlackRock, along with several high-profile venture capital and angel investors, Acorns is a competent offering geared toward beginning investors. It focuses on micro savings through features that help investors round up spending on everyday purchases to build an investment balance. Its Earn program also enables individuals to get rebates on certain purchases made through more than 200 participating companies. With no investment minimum and a straightforward investment approach, it is accessible to a wide range of investors.

Acorns’ subscription-based pricing model is relatively cheap for investors who start with the entry-level Personal plan, which includes access to a single investment account, retirement account, and checking account. Investors pay only $3 per month regardless of the account size, which translates into about 0.24% per year for a $15,000 balance. However, the Family plan, which adds additional accounts for children, comes with fees of $5 per month, which increases the charge on a $15,000 balance to 0.40%. Underlying fund fees are about 12 basis points, on average, which is in line with most other robo-advisors.

Although fees are generally competitive, Acorns' features are a bit lacking. It offers automatic rebalancing but no tax-loss harvesting. An affiliated website (Acorns Grow) includes a few financial calculators, but the program is light on planning-related features.

Acorns offers a small number of portfolios corresponding to different risk levels (five core portfolios and four sustainable portfolios). The program sticks with mainstream asset classes, but some of its asset mixes are less conventional: The most aggressive portfolio allocates 100% of its assets to stocks, and the most conservative 100% to short-term bonds. Acorns offers UTMA/UGMA accounts for the Early program, but these accounts lack tax benefits, and account owners have full access to the funds when they reach the age of 21 in most states (18 in a few). Acorns also defaults these accounts into the Aggressive portfolio, which is less than ideal for kids approaching college age.

Despite these asset-allocation quibbles, the quality of the underlying investments (mainly from iShares, Vanguard, JP Morgan, and Goldman) is above average.

Ally Invest | ● Average

Ally Invest is a solid and improving offer that is especially attractive to parent Ally Financial's ALLY banking customers.

The April 2016 acquisition of TradeKing paved the way for its May 2017 rebranding as Ally Invest. Mitesh Patel, who had worked at Ally from 2009 to 2014, then rejoined in May 2018 to develop the service. He now works as part of a five-person investment committee whose members each have at least a decade of industry experience.

Patel and his team have added investment options and planning capabilities while lowering the service's minimum investment to $100 from $2,500. Ally's current suite of 32 portfolios relies on inexpensive Vanguard and iShares ETFs and comes in two basic types: Market Focused (2% cash allocation) for a 0.30% annual advisory fee and Cash Enhanced (30% cash allocation), which has no advisory fee. Each type has a core, tax-optimized, and ESG version. All three versions have five different allocations based on one's risk profile (conservative, moderate, moderate growth, growth, aggressive growth). There is also an income version of each type.

The portfolios include domestic size tilts and varied regional exposures. For example, the Market Focused Core Aggressive portfolio's 93% equity stake is divided among U.S. large-cap (33%), mid-cap (17%), and small-cap (6%) stocks as well as non-U.S. developed (30%) and emerging (7%) markets. A tiered rebalancing approach is distinctive: The thresholds are smaller for asset classes with single-digit allocations and larger for those with double-digit allocations, though Ally does not disclose its thresholds.

In 2022, Ally will launch a new offering for clients that includes a dedicated human advisor alongside the digital advisor for a premium fee. But those planned premium fees, which were shared with

Morningstar, are relatively steep, and Ally has other weaknesses to address. Tax-loss harvesting isn't yet an option. Investors are defaulted into the Cash Enhanced portfolios, whose 30% cash allocation may earn a competitive rate relative to other high-yield savings accounts but won't keep up with inflation. Investors might do better in an ultra-short-term bond fund like Vanguard Ultra-Short Bond ETF VUSB even after a modest advisory fee. It is also unclear what would draw an investor who doesn't already bank at Ally to the service, when more competitive options exist.

Betterment/Betterment Premium | 🟢 Above Average
Betterment's transparency and value set it apart. Since its May 2010 launch, it has cut fees and added investment options and features to make investing and retirement planning easier for a retail audience. It also introduced in October 2014 a digital platform for financial advisors who want to manage client assets using Betterment's tools and advice. These gradual improvements help explain its position as the largest and most successful stand-alone robo-advisor launched in the previous decade.

Betterment publicly documents on its blog how it builds and maintains various target risk portfolios while also attempting to maximize their tax efficiency. It is one of the few robo-providers that employs a glide path, which gradually adjusts the portfolio's asset mix to become more conservative over time. Portfolio construction is sensible and well-thought-out: The main Core Portfolios series offers a mix of low-cost ETFs with exposure to several major asset classes, such as U.S. stocks, international stocks in both developed and emerging markets, investment-grade bonds, world bonds, and Treasury Inflation-Protected Securities. Within the U.S. equity allocation, Betterment tilts the portfolio toward value and smaller-cap stocks as part of an optimization process meant to generate higher expected returns. Beyond its core offering, Betterment offers smart-beta portfolios, target income portfolios, and sustainability-focused portfolios with specific investing styles. It also offers thematic versions of its sustainability-focused and, more recently, core portfolios through adding exposure to thematic ETFs.

Betterment bases its allocation guidance on a relatively simple risk-tolerance questionnaire. Unlike some firms, which attempt to quantify a client's risk tolerance as a portfolio construction input, Betterment focuses on the amount and timing of the money a client needs when advising on allocation.

Betterment has a wide range of services, especially given its below-average price tag. It charges a 0.25% asset-based annual fee for automated portfolio management. Advice is part of the offer, too, and investors who aggregate their outside banking and investment accounts can get holistic help with retirement investing, goal planning, and prioritizing various accounts. Although on-demand access to an investment advisor is locked behind a steeper 0.40% fee for Betterment Premium, Betterment is one of the few robo-advisors that lets clients pay hourly for advice on specific situations, such as retirement planning, general financial advice, college savings, marriage planning, and other topics.

E-Trade Core Portfolios | 🔴 Below Average
E-Trade Core Portfolios meets industry standards in some respects, but a lack of transparency renders it inferior to most robo-advisors.

The program’s 0.30% annual asset-based advisory fee is in line with most competitors’, but it does not include the underlying ETFs’ expense ratios. Because the firm doesn’t divulge which ones it uses or their relative weightings, it is impossible to calculate total costs. Those could add another 5 to 25 basis points of fees, depending on whether investors choose a standard, sustainable, or smart-beta portfolio.

Insight into portfolio construction could be better. There is little public information about what the program invests in or the rationale for the portfolios’ allocations and investment selections. The portfolios currently use third-party ETFs exclusively, although the wrap fee program brochure notes that E-Trade reserves the right to expand the universe of portfolio managers to include products affiliated with Morgan Stanley, which acquired E-Trade in October 2020. Lockwood Advisors serves as an investment advisor to the program and is responsible for selecting ETFs based on a quantitative screening methodology that incorporates historical performance, expenses, tracking error, and liquidity.

The program offers both retirement-focused portfolios and tax-sensitive portfolios that invest in municipal-bond ETFs. In addition, investors can opt into smart-beta or ESG-focused portfolios. E-Trade uses a standard drift rebalancing methodology, which involves making portfolio shifts whenever the portfolio floats away from its target allocation. It also employs a calendar rebalancing feature whereby accounts enrolled for at least six months are automatically rebalanced semiannually.

Breadth of services is lacking. Investors can only invest toward a single goal, and there is no tax-loss harvesting feature or tax location guidance. Investors also do not have access to advisors or benefit from account aggregation. Proactive client communication seems to be limited to monthly email updates, though clients do have access to other E-Trade communications and educational materials.

It is not clear what Morgan Stanley’s October 2020 acquisition of E-Trade means for this service. So far, though, E-Trade’s offering does not stand out.

Fidelity Go/Fidelity Personalized Planning & Advice | ● Above Average
Fidelity Go stands out for its simple, straightforward approach that draws on Fidelity’s strong global research and asset-allocation team. Many key executives within the Fidelity Strategic Advisors unit overseeing this program have spent at least 15 to 20 years with the firm. Fidelity Go is free for accounts with balances up to $10,000 and charges $3 per month for accounts between $10,000 and $50,000. Investors with balances above $50,000 pay 0.35% per year.

The program starts with a relatively thorough risk-tolerance questionnaire. Questions cover the investor’s investment goals, time horizon, household income, risk tolerance, investment experience, investment knowledge, reaction to falling markets, emergency fund, spending as a percentage of income, likelihood of unexpected future expenses, household financial situation including job security, and value of total assets. Fidelity then uses this information to map investors to a taxable or retirement-focused portfolio, with each spanning seven different risk levels. The portfolios all focus on a short list of core asset classes, such as U.S. stocks, international stocks, and intermediate core bonds; esoteric asset classes or ESG-focused strategies aren’t part of the offer.

Although Fidelity Go’s investment advisory fees are slightly above the peer median for higher account balances, it invests in a streamlined list of zero-expense ratio Fidelity Flex funds, which keeps total costs slightly below average.

The program also offers ongoing support. Text alerts and other communications let customers know how they are progressing with their goals, as well as provide behavioral nudges to encourage long-term investing. Like Vanguard Digital Advisor, however, Fidelity Go does not currently offer tax-loss harvesting.

Fidelity’s premium Personalized Planning & Advice service (available for accounts with at least $25,000) charges 0.50% of assets and offers additional financial planning services. Participants have access to unlimited advice and planning calls and can choose from a menu of coaching solutions focused on different topics, including retirement planning, budgeting, and debt management. In contrast to Betterment and Schwab, though, not all its financial advisors hold the CFP designation, which makes its 0.50% price tag comparatively steep.

Marcus Invest | ● Average
Goldman’s ambitions for its Marcus platform of consumer investing and banking services haven’t yet translated into a materially differentiated product. Marcus Invest offers clients a satisfactory suite of diversified target risk portfolios, but it lacks features like financial planning advice and tax-loss harvesting that come with top robo-advisors, leaving users with a straightforward target-risk portfolio and only educational materials to consult.

Clients can choose from three investment styles: Core, ESG, and Smart Beta. Each style has the same asset class allocations but differs in the ETFs chosen to populate the portfolios. Established Goldman Sachs teams, such as the Investment Strategy Group and Alternative Investments and Manager Selection, design and execute the portfolios, which range from 100% fixed income to 100% equity and come in increments of 10 equity percentage points. As for which portfolio allocation within those styles is best for an investor, a recommendation tool determines that based solely on one’s stated investment time horizon and risk tolerance for each advisory account. Once investors receive a recommended portfolio, they can choose that portfolio or one directly above or below it on the risk spectrum. They can also opt to start over again for a new recommendation.

Marcus Invest's 0.35% advisory fee is 5 basis points more than the median of robo-advisors we surveyed. However, Marcus' lack of subsequent guidance and financial planning tools following the signup process renders the service even more costly than its headline advisory fee suggests. Investors are in effect paying for the initial allocation to Goldman-designed portfolios but get little otherwise. Goldman will refund the advisory fee to investors with Goldman Sachs ETFs in their portfolios, but that only applies to the Smart Beta portfolios and it is capped at the 0.35% advisory fee all investors pay.

Merrill Edge Guided Investing | ● Below Average

Launched in 2017, Merrill Edge Guided Investing is a pricey bridge between Bank of America's legacy self-directed investing platform and Merrill Lynch's full-service financial advisors. It also offers a limited feature set, and there are cheaper and better options elsewhere, in our view.

Clients with total assets of $20,000 or less can expect to pay the offering's full 0.45% advisory fee, which is 15 basis points more than the median of robo-advisors we surveyed. Those in the bank's Preferred Rewards program pay less as they accrue assets, but fees only level off at the 0.30% median for balances of $100,000 or more.

Portfolio construction appears fairly standard, but there are a few sticking points. The firm offers five levels of risk tolerance, with tax-aware and tax-free options as well as an ESG suite for each of these risk levels. However, the firm's risk-tolerance questionnaire is less detailed than most. Indeed, time horizon and starting/ending money goals appearing to be one of the major inputs to determine an investor's target risk portfolio, which can't be overridden.

Merrill Edge tilts its portfolios—composed almost exclusively of low-cost ETFs—toward certain asset classes, such as value stocks, and away from others based on firmwide capital market assumptions. These active asset-class decisions add uncertainty as they could help or hurt in any given year. In addition, riskier high-yield munis are used as a supporting allocation, and the Impact/Sustainability portfolios do not have a tax-aware version, making their suitability for a taxable portfolio questionable.

Service breadth is also an issue. While Merrill Edge's broader brokerage platform allows for integrating external accounts for portfolio analysis, this data isn't aggregated into the robo-advisor itself and must be manually inputted. More-complicated features like tax-loss harvesting aren't available, and access to an advisor is locked behind a significantly more expensive premium tier, which starts at 0.85% per year and drops to 0.70% for accounts with at least $100,000.

Ultimately, this robo-advisor seems like an afterthought within Merrill Lynch's wealth-management empire. The firm's self-directed brokerage platform offers educational resources (ranging from college savings calculators to in-depth market reports from Bank of America Global Research), but these aren't directly available in the robo-advisor area of the site, which has only a few basic articles about saving and investing. Worse still, features that are available elsewhere within Merrill's purview are not available here: Merrill offers its self-directed clients the option to open a 529 account, for example, but not through its robo-advisor program.

Morgan Stanley Access Investing | ● Below Average

Morgan Stanley Access Investing is a complicated service with an uncertain future.

At first glance, the program looks reasonable enough. The 0.30% investment advisory fee is in line with its typical rival, but the firm tarnishes its offering by providing access to high-cost mutual funds without waiving their underlying fees. The Market Tracking ETF portfolios use a standard mix of low-cost ETFs for their portfolios, but both the Impact and especially the Performance Seeking portfolios include higher-cost options. The Frontier Markets theme, for example, invests in a mix of funds with a steep 0.57% average expense ratio, thanks in part to a heavy investment in Harding Loevner Frontier Emerging Markets HLFMX at the cost of 1.62%.

The program's portfolio options may also be too complex for investors to use effectively. The firm provides three different types: Market Tracking portfolios are made up of low-cost, passively managed ETFs; Impact are composed of slightly more expensive ESG-branded ETFs and funds; and Performance Seeking consist of a mix of active and passive funds across sectors. Investors who opt for the Impact and Performance Seeking portfolios can choose niche funds focusing on certain themes, such as data, artificial intelligence, and clean water. Such funds have been in vogue lately but have questionable utility for long-term investors.

The program's five risk tiers (aggressive to conservative) are standard, but portfolio allocations can be counterintuitive for investors who opt for various themes. Inflation-conscious investors, as one example, get high TIPS allocations for more-aggressive portfolio risk levels and smaller allocations for conservative risk levels. Further, there doesn't appear at first glance to be a separate taxable or tax-free allocation; all portfolios default to options that appear, in some cases, subject to potentially high capital gains.

Morgan Stanley's investment management resources are substantial, but it is not apparent if they are applied well here; the firm declined to provide details about this offering. More important, the firm purchased E-Trade in February 2020, which has its own suite of brokerage and robo-advisor services. It is not clear how this service may change as the two firms continue to integrate their operations.

Schwab Intelligent Portfolios/Schwab Intelligent Portfolios Premium | ● Above Average
Problematic cash allocations hold back Schwab's otherwise excellent robo-advisor program.

The portfolio construction process has several strengths. It uses an extensive risk-tolerance questionnaire to match investors with portfolios from one of 12 different risk levels. The portfolios provide comprehensive asset-class exposure, including both U.S. and international large- and small-cap stocks, REITs, corporates, mortgages, high yield, muni bonds, world bonds, emerging-markets debt, Treasuries, TIPS, and gold. The underlying investments are solid, while Schwab's approach to portfolio construction, rebalancing, and tax management is thoughtful.

Although Schwab Intelligent Portfolios does not charge an advisory fee, the underlying funds' average expense ratio is slightly above average at 0.20%. In addition, the portfolios all include allocations to low-yielding in-house cash allocations that weigh down returns and diminish purchasing power amid resurgent inflation and low bond yields. Cash allocations range from 6% of assets for the most aggressive portfolios to 29.4% for the most conservative.

The transparency of those cash accounts in relation to Schwab's fee model is a key issue, though. While the portfolios are nominally "free" for investors with at least $5,000, those enticed by getting digital investment management without paying for it may not realize that Schwab is using the cash portion of their assets to generate revenue. Schwab receives the spread (or difference) between the revenue it earns on asset balances in Schwab Bank and the yield it pays investors. The SEC is investigating Schwab's previous disclosures related to its use of cash, and the company set aside $200 million in 2021's second quarter to cover potential settlement costs.

Schwab Intelligent Portfolios Premium suffers from the same cash issue but otherwise has considerable merit. Investors with at least $25,000 have unlimited access to a financial planner holding the CFP designation. The service offers a range of online tools for advice on income, expenses, investments, college savings, retirement planning, and other issues. It is also one of the only robo-advisors to provide comprehensive retirement income advice.[2] The program helps investors determine how much they can afford to withdraw from their portfolios and schedule recurring withdrawals from both taxable and tax-deferred accounts, such as IRAs.

The premium service's flat fee structure allows customers to benefit from economies of scale as their asset balances grow. Following a $300 planning fee for year one, investors pay just $360 annually thereafter. That's pricey for smaller accounts, but individuals with balances of $90,000 or more would pay less than they would for similar offerings from Betterment and Fidelity.

SigFig | ● Above Average

SigFig is a lean offering that doesn't sport the same scale of resources as some of its competitors, but it checks all the right boxes for a robo-advisor.

SigFig's evolution since its 2006 start as Wikinvest, an online forum for sharing investment ideas, has helped it develop capabilities that still put it ahead of most peers. After pivoting toward automated investment advice in 2011, the firm curated a group of financial advisors to provide in-person consultations. It also introduced tax-advantaged and taxable portfolios as well as tax-loss harvesting.

SigFig's overall fee is below the median of robo-advisors we surveyed. The program is free for accounts less than $10,000 and charges 0.25% for accounts at and above that size. It uses a suite of low-cost ETFs for its portfolios (the ETFs differ depending on which custodian the customer chooses for the account) but does not waive or return fees on these holdings.

SigFig's portfolio construction approach is simple but sensible. Allocations are strategic and updated periodically depending on the market environment and SigFig's capital markets assumptions. They are generally reasonable, with equity allocations for taxable portfolios ranging from 26% to 90% of assets, depending on the risk level, and 13% to 85% for retirement portfolios. Regardless of risk tolerance, however, all the tax-deferred portfolios allocate at least 7% of assets to emerging-markets debt (which could be considered slightly aggressive) as well as 5% to REITs. In addition, the portfolios rely on one broad index for U.S. stock exposure, with no granularity for separate allocations by style or market cap.

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[2] Capital One Investing also offers advice on retirement drawdown strategies but is much smaller. Morningstar was previously a minority owner of Capital One Investing predecessor United Income, which Capital One acquired in 2019.

The firm’s executive team appears well-resourced, although a few senior leaders have left in recent years. The CEO and chief technology officer have both been with the firm since 2011. Chief investment officer Terry Banet, who also joined the firm in 2011, has extensive experience in investment research and asset-allocation roles at J.P. Morgan and other firms. The firm’s size peaked in 2019, however, and appears to have shrunk significantly since.

The service has some weaknesses. It does not provide advice for multiple investment goals and lacks more dedicated educational resources that could help clients make SigFig their “one-stop shop.” In addition, the privately held firm’s focus on partnering with larger corporations like UBS and Wells Fargo raises questions about whether it will remain a stand-alone robo-advisor. Many stand-alone robo-advisor firms have been acquired (witness Wealthfront’s recent agreement to join forces with UBS), and SigFig’s small size and limited revenue base could make it a more likely acquisition target than some of its peers.

SoFi Wealth | ● Average
SoFi Wealth clients with as little as $1 can start an account and for no advisory fee can talk with a CFP to plan their financial lives. While those attributes are attractive, the service’s potential shortcomings are cause for concern.

Parent company SoFi Technologies SOFI was originally a student loan refinancing business that later expanded into personal loans, credit cards, and mortgages. It launched SoFi Wealth in May 2017 to provide members with low-cost ETF portfolios. The offering now includes taxable or tax-advantaged fixed-income allocations that can be blended with an equity allocation according to five standard risk tiers.

The service, however, seems as much designed for monetization through cross-selling as for serving investment needs. The company’s strategy emphasizes increasing product adoption to spur firm profitability in what it calls its “Financial Services Productivity Loop.” As a publicly traded firm since June 1, 2021, SoFi is now under pressure to generate earnings, but it has lost money each year since 2019 for a total of $947.7 million. That raises concerns about SoFi’s client acquisition strategy in comparison to loss-leader approaches used by profitable firms like Fidelity.

Despite its losses, SoFi has waived the 0.19% expense ratios for its proprietary SoFi Select 500 ETF SFY and SoFi Next 500 ETF SFYX, which together account for about two thirds of the model portfolios’ equity exposure. Should those waivers expire, the ETFs’ expense ratios would no longer be in line with SoFi’s low-cost aims. Moreover, the current tax-advantaged fixed-income allocation includes a pricey iShares high-yield corporate ETF that charges 0.48% per year, more than 3 times a similar iShares high-yield ETF’s cost.

SoFi offers clients access to financial advisors by phone, virtual meetings, and electronic messages at no extra charge. SoFi’s advisors must have Series 65 licenses and either have the CFP designation or be actively working toward it. SoFi provides a broad range of advice, including advice on goals, saving, investing, budgeting, debt repayment, home buying, and insurance.

SoFi's advice comes with potential hidden costs, though. As mentioned, its business model is based on cross-selling various services that generate additional revenue, such as student loan refinancing, personal loans, private student loans, home loans, and estate planning referrals.

There are other disconcerting signs. Despite names suggesting core exposure, both proprietary SoFi ETFs track growth benchmarks and thus introduce style bias into the portfolios' equity exposure. The portfolios also tilt more toward U.S. stocks than broad global benchmarks. These two biases together enhanced recent back-tested results, which, as of mid-2021, SoFi marketing material used to promote its offer's performance versus a blended benchmark that also includes a 0.48% management fee, even though benchmark-tracking passive options are available for a fraction of that fee.

Titan | ◉ Low

Titan's aggressive investment platform, narrow focus, and relatively unproven management render it the least attractive robo-advisor among those we surveyed.

Titan is defined as much by what it isn't as by what it is. It is not a holistic financial planner, nor does it intend to be. It does not provide tax advice, nor does it typically manage its portfolios with regard for tax consequences, which means rebalancing portfolio allocations among its volatile equity and crypto strategies can result in big tax bills for clients investing in taxable accounts.

To the extent Titan proffers advice, it is in using client information to place them in aggressive, moderate, or conservative stock portfolios, distinguished only by the percentage of assets each hedges: 0%, 5%, and 10%, respectively, when not in a market downturn, and 5%, 10%, and 20% during one. It is not clear how Titan differentiates a hedge-worthy downturn from normal volatility or avoids selling at a low to increase the hedge when it should be buying. The notorious challenge of market-timing—an approach that often fails—only raises further questions.

Titan portfolios' long exposure comes from four concentrated, actively managed options. Its three equity strategies invest in 15 to 25 stocks each, with Flagship focusing on U.S. large caps, Opportunities on U.S. small- and mid-caps, and Offshore on non-U.S. companies. Crypto, which holds five to 10 digital currencies, rounds out the offer.

Titan doesn't disclose much detail about its investment team, but depth of investment management experience seems wanting. The two cofounders with investing experience each have less than five years of experience as long-short generalists for hedge funds, and the third cofounder has worked at early-stage growth companies for the past decade. Only in July 2022 will CIO Clayton Gardner hit a decade in the industry.

Investors could do worse than Titan. Compared with the long-short equity Morningstar Category's 1.73% median expense ratio, it is cheap: charging $60 per year for accounts with less than $10,000 and 1% of assets for accounts with more. But compared against robo-advisors, the latter fee is the highest in our survey.

Titan's problematic marketing also stands out. Some aspects, such as daily investing insights, are helpful. Others, like branding itself as a pocket hedge fund and likening mutual funds to VHS, obscure Titan's lack of innovation: It offers little more than aggressive, concentrated portfolios, which are not new and tend to be difficult to use well.

UBS Advice Advantage | 🔴 Below Average

Hefty costs, steep account minimums, and poor transparency are significant negatives for UBS Advice Advantage.

The program's 0.75% annual fee makes this offering among the priciest robo-advisors we evaluated. Those fees are in addition to expense ratios for the underlying funds used in the program, which are difficult to determine because UBS does not disclose which funds are used in the portfolios. In addition, high account minimums of $10,000 make this program less accessible to entry-level investors.

UBS Advice Advantage debuted in 2018 as a standard robo-advisor that provides access to a financial advisor and leverages SigFig's algorithm. The program offers investment advice, custody, trading/execution, and performance reporting. Investors can choose from five different portfolio risk levels based on a standard risk-tolerance questionnaire. UBS is responsible for the development and maintenance of the model portfolios and uses the algorithm for ongoing monitoring, rebalancing, and tax-loss harvesting. Portfolio allocations are based on UBS' capital market assumptions, strategic asset allocations, and covariance estimates. However, key executives listed in the Form ADV are all part of UBS' larger Wealth Management platform, so it is unclear whether this program has a dedicated investment management team. In addition, UBS does not publicly disclose which asset classes and underlying funds are used in the program.

On the positive side, UBS Advice Advantage includes access to financial advisors as well as portfolio diagnostics that incorporate outside holdings. However, it seems to play a secondary role within the larger UBS universe and serves partly as a funnel for higher-cost advisory services. With a disappointing amount of public information available and no details disclosed about underlying funds, little credit can be given to this offering. Additionally, with UBS Group's UBS early 2022 agreement to acquire the well-respected robo-advisor Wealthfront, the future of this service is uncertain.

Vanguard Digital Advisor/Vanguard Personal Advisor Services | 🟢 High

Vanguard Digital Advisor, or VDA, and its hybrid sibling Vanguard Personal Advisor Services, or PAS, which combines automation with human expertise, are not the best in every respect of the robo-advisors we surveyed, but they are the best overall.

Vanguard has been in the advice business since 1996, but it did not move into discretionary asset management until the respective May 2015 and May 2020 launches of PAS and VDA. Aiming to transform advice in the same way it revolutionized investment management with index funds, Vanguard continues to invest heavily in both services through adding capabilities and hiring personnel. In 2022, Vanguard plans to add ESG options to VDA and tax-loss harvesting to PAS. The two services at present otherwise have numerous features associated with top robo-advisors. VDA, for example, offers outside account aggregation, custom goal planning, debt planning, a rainy-day tool, and a next-dollar optimizer that helps investors choose between competing financial priorities.

VDA’s $3,000 minimum makes the service less accessible than some. But its 0.20% annual asset-based charge, including advisory and underlying ETF fees, is very competitive and is not reliant on waivers that might expire.

VDA’s approach to portfolio construction combines simplicity with customization. Using four broadly diversified ETFs focusing on U.S. and non-U.S. stocks and U.S. and non-U.S. bonds, VDA draws on the Vanguard Life-Cycle Model to create more than 300 glide paths based on an investor’s age, goal(s), and risk tolerance. The risk-tolerance assessment was not created in-house, however, but uses third-party Capital Preferences’ well-researched scenarios. VDA then evaluates portfolios daily and rebalances when any asset class is off target by more than 5 percentage points. The glide paths are updated annually as model inputs change.

The premium PAS offer has a $50,000 investment minimum and starts at a 0.30% annual advisory fee. Clients receive unlimited access to a pool of CFPs until their assets exceed $500,000, at which point Vanguard assigns them a dedicated CFP who touches base at least twice a year. PAS typically uses the same four total market ETFs to build portfolios; however, clients can also invest in Vanguard’s three new Advice Select active strategies, which are run by proven managers from two of Vanguard's most trusted subadvisors, as well as many other options not available within VDA.

As investors’ financial lives become more complicated, the ability to transition to PAS is a strength. In addition, PAS offers access to holistic, tailored financial planning advice at a cheaper price than any competing offering.

Wealthfront | ● Above Average
Wealthfront has considerable merits, although some strategic shifts and questionable allocations hold it back.

The merits start with attractive fees. Its 0.25% annual advisory charge is cheaper than most, and expense ratios are reasonable for most of the underlying funds used in the portfolios. The quality of the underlying funds is also generally strong; the majority used in Wealthfront’s portfolios receive Morningstar Analyst Ratings of Gold or Silver. The program includes a thorough questionnaire that incorporates behavioral economics research to evaluate both risk tolerance (an investor’s subjective willingness to take risk) and risk capacity (their objective ability to take risk given their financial assets and other resources).

Wealthfront uses the responses to slot investors into a portfolio matching one of 20 risk levels spanning three account types: taxable, retirement, and socially responsible investing. Customers also have access to financial planning tools (though not to human financial advisors) for spending, savings, income growth, inflation, Social Security, taxes, college planning, and home equity. The website provides information on a wide range of planning-related questions, as well as numerous methodology papers and transparent performance disclosures.

Still, some of Wealthfront's strategic pivots seem driven by popular but not necessarily prudent investment trends. Many of its portfolios are on the aggressive side; for example, its retirement portfolios allocate up to 14% to emerging-markets stocks, 15% to real estate, and 10% to emerging-markets debt. It previously opted investors into a risk parity strategy that has consistently disappointed; Wealthfront now lets them invest up to 10% of their assets in cryptocurrency through Grayscale Bitcoin Trust (BTC) GBTC and/or Grayscale Ethereum Trust (ETH) ETHE, which are high-cost vehicles whose grantor trust structure leads to significant tracking error.

Its early 2022 agreement to be acquired by UBS is ironic given that this Swiss banking giant is the kind of firm Wealthfront originally sought to disrupt. However, Wealthfront says UBS has committed to letting Wealthfront continue to operate under its own brand as a stand-alone business.

Wells Fargo Intuitive Investor | ● Below Average

With uncompetitive fees, limited disclosure on underlying portfolio holdings, and an average breadth of services, Wells Fargo Intuitive Investor is not compelling.

Designed for customers who are already banking clients, the program's 0.35% asset-based fee is 5 basis points higher than the median for robo-advisors we surveyed. The $5,000 investment minimum, while in line with traditional brokerage robo-offerings, is also a bit higher than most. Because Wells Fargo does not provide details about the underlying ETFs used, it is difficult to assess the total costs associated with the program.

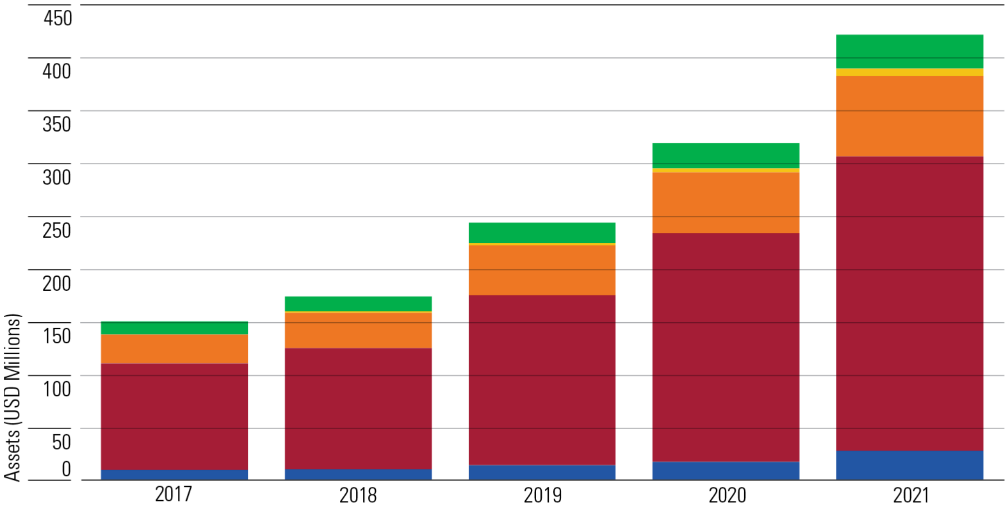
Like UBS, Wells Fargo uses the proprietary portfolio management algorithm from SigFig for ongoing monitoring, rebalancing, and tax-loss harvesting. Investors can choose from Wells Fargo's nine investment portfolios based on their answers to a risk-tolerance questionnaire. The suggested asset-allocation strategies are proprietary to Wells Fargo and include a series of nine portfolio risk levels, with each composed of seven to 11 ETFs. Portfolio allocations look reasonable, with minimal cash allocations and adequate exposure to major asset classes.

Access to a financial advisor at no cost seems to be the only feature that stands out as a clear advantage. The offering seems to play a strategic role within the larger Wells Fargo universe to bring in new investors for other opportunities. Although information provided about the program's approach to portfolio construction has improved in recent months, the service remains anything but intuitive, with no information available on the underlying funds or holdings prior to enrolling.

Industry Trends

Long-standing expectations for robo-advisor industry growth have started to materialize. Of the 10 offerings for which we have data from year-end 2017 through 2021, the median annualized growth rate was 53.4%. Fidelity's estimated 170.7% growth was the highest following Fidelity Go's mid-2016 debut. While growth typically slowed as assets under management increased, Vanguard still grew at a 28.9% annualized rate over the period, even though its assets under management in late 2021 were 8.7 times more than its next biggest competitor, Betterment.

Exhibit 4 Asset Growth Trends for Selected Robo-Advisors



	2017	2018	2019	2020	2021
🟩 Betterment	12,415.8	14,240.1	19,352.7	23,861.6	32,116.6
🟨 Fidelity[1]	133.0	1,290.1	2,247.7	3,875.8	7,137.2
🟧 Schwab	27,300.0	33,400.0	47,200.0	57,900.0	76,100.0
🟥 Vanguard	101,000.0	115,000.0	161,000.0	216,400.0	279,100.0
🟦 Wealthfront	8,866.5	9,407.5	13,484.5	16,627.0	27,000.0

Source: Morningstar. Data as of Dec. 31, 2021.

[1] Estimates based on the underlying assets for the Fidelity Flex funds used in the program.

Industry leaders are now in an arms race when it comes to building robo-advisor capabilities. Vanguard, for example, plans to introduce automated tax-loss harvesting to its premium offering in 2022, but introducing that feature to its basic service is not yet on the horizon. Vanguard plans to add ESG portfolios to the basic service soon, but that is something many other services have already done, including Ally Invest.

Exhibit 5 Robo-Advisor Historical Milestones (2007-22)

	Date		Activity
Startups create the robo-advisor market	**2007**	Feb	Wealthfront predecessor KaChing raises Series A funding
		Mar	SigFig predecessor Wikinvest raises Series A funding
	2008	Jan	Betterment's parent company founded in New York
	2010	May	Betterment officially launches at TechCrunch Disrupt New York
		Nov	Betterment raises Series A funding
	2011	Jun	SoFi created by four Stanford students to disrupt student-loan market
		Dec	Wealthfront launches new online financial advice service
	2012	Jan	Acorns launched by father-and-son team with focus on micro-investing
		May	Wikinvest rebrands as SigFig and shifts focus to digital portfolio allocation and rebalancing
	2014	Nov	Ellevest[1] co-founded by Sallie Krawcheck and Charlie Kroll
Incumbents enter	**2015**	Mar	Charles Schwab introduces Schwab Intelligent Portfolios
		May	Vanguard launches Vanguard Personal Advisor Services, a hybrid advice offering
		Sep	BlackRock acquires FutureAdvisor
	2016	Jun	Ally Financial acquires robo-advisor platform by purchasing TradeKing
		Jul	Fidelity Investments introduces Fidelity Go
	2017	Feb	Bank of America/Merrill Lynch introduces Merrill Edge Guided Investing service
		May	SoFi introduces SoFi Wealth service
		Nov	Wells Fargo launches Intuitive Investor service with technology from SigFig
		Dec	Morgan Stanley introduces Morgan Stanley Access Investing platform
	2018	Feb	Titan Invest launches as a robo-advisor with a self-styled hedge fund focus
		Apr	UBS launches UBS Advice Advantage designed with SigFig technology
Acquisitions, IPOs, and further launches	**2019**	Aug	Capital One Financial acquires United Income[2]
	2020	May	Vanguard introduces Vanguard Digital Advisor platform
		Oct	E-Trade Financial is acquired by Morgan Stanley
	2021	Feb	Goldman Sachs introduces robo-advisor Marcus Invest after delaying its planned 2020 launch by one year
		May	SoFi goes public through a reverse merger and begins trading on the Nasdaq
		Dec	SageView Advisory Group acquires $900 million of client portfolios from Capital One Investing
	2022	Jan	Wealthfront agrees to be acquired by UBS Group for $1.4 billion

Source: Morningstar research, PitchBook, online articles. Data as of March 31, 2022.

1 Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management LLC to provide certain services, including licensing the Wealth Forecast Engine.

2 Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.

Since robo-advisor providers first began multiplying around 15 years ago, client acquisition has been a major challenge, especially for stand-alone firms. Moreover, the pursuit of clients has pushed most providers toward portfolios composed primarily of low-cost ETFs, even if they did not start out that way.

Consider Wealthfront predecessor KaChing. After raising funds from outside investors in early 2007, this Palo Alto, California-based startup first became widely known in 2008 through directing Facebook users to its stock-picking site. There, akin to a fantasy football tournament, members of the public could compete on paper to beat the market and one another. The firm then recruited the winners, dubbed them "geniuses," and ranked them according to their "Investing IQs." It later allowed clients to invest real money alongside these top stock-pickers.

Despite founder Dan Carroll's confidence that he could disrupt the mutual fund industry by helping investors beat the market, KaChing's original business model did not last. Between October 2010 and November 2012, KaChing rebranded as Wealthfront, transitioned to a full-fledged robo-advisor—initially offering six asset-class-specific ETFs optimized according to risk tolerances—and hired as its chief investment officer Burton Malkiel, the well-known author of *A Random Walk Down Wall Street* and advocate of low-cost passive strategies.

Consolidation and the challenge of integration is another trend. Even when stand-alones like Wealthfront reach a viable range for profitability, which in 2015, Morningstar's Michael Wong estimated at $16 billion to $40 billion in assets under management, they are still acquisition targets. Indeed, on Jan. 26, 2022, Swiss banking giant UBS announced plans to acquire Wealthfront, which currently has about $27 billion in assets, even though UBS had launched its own robo-advisor in 2018.

Prior acquisition efforts have not always been successful, and examples of firms unable to integrate purchases abound. In mid-2012, LPL Financial Holdings' LPLA then newly created subsidiary, Nestwise, acquired the hybrid service Veritat Advisors to serve middle-class households with the financial ability to save. The venture did not work, though, and by Sept. 1, 2013, LPL closed the business. John Hancock's 2015 acquisition of robo-advisor Twine (from Guide Financial) did not work and ceased in December 2021. LearnVest, which had launched to much acclaim in 2008, was bought by Northwestern Mutual in 2015 but shut down three years later. Principal Financial Group's 2018 acquisition of digital advice startup RobustWealth closed in September 2021.

More recently, Capital One agreed in December 2021 to sell its Capital One Investing portfolios and employees to SageView Advisory Group, a Registered Investment Advisor that focuses on retirement plans. Capital One had just acquired the business in 2019.[3]

Acquisitions have continued but with mixed results. BlackRock bought and added FutureAdvisor to its product lineup in 2015, but the service now appears dormant as it is no longer onboarding new clients. Morgan Stanley's 2020 acquisition of E-Trade still seems to be in the integration phase with Morgan Stanley's own robo-advisor, Morgan Stanley Access Investing. As mentioned, Wealthfront recently agreed to be acquired by UBS Group for $1.4 billion; the deal is expected to close in the second quarter.

A final trend is the combination of automation with a personal touch. Although fully automated robo-advisors can serve more clients at a lower cost, several of the robo-advisors we surveyed offer at least some access to financial advisors (see Exhibit 11). Most, however, only provide access with their pricier premium services or as an add-on to subscription-based services. There is a tension between keeping a

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[3] Morningstar was previously a minority owner of United Income, the business Capital One acquired in 2019.

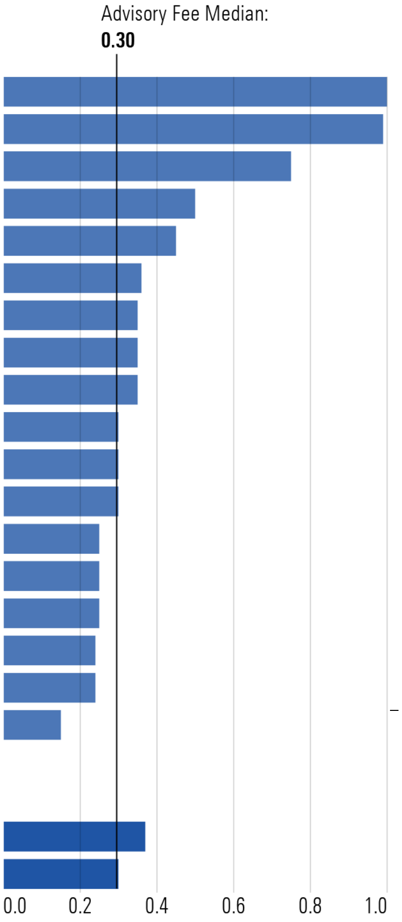
service as cheap as possible and enhancing its range of services by letting investors talk to human beings.

Pricing

Price gets a 30% weight in our robo-advisor rankings. The price assessment carries this much weight for good reason. One of the few investing certainties is that the less investors pay for asset management and advice, the more they keep for themselves.

Exhibit 6 Annual Advisory Fees for Selected Robo-Advisors

	Minimum Investment Amount (USD)	🟦 Annual Advisory Fee % for $15,000 balance[1]
Titan	100	1.00
Capital One Investing[2]	100,000	0.99
UBS Advice Advantage	10,000	0.75
FutureAdvisor	5,000	0.50
Merrill Edge Guided Investing	1,000	0.45
Ellevest[3]	none	0.36
J.P. Morgan Automated Investing	500	0.35
Marcus Invest	1,000	0.35
Wells Fargo Intuitive Investor	5,000	0.35
Ally Invest	100	0.30
E-Trade Core Portfolios	500	0.30
Morgan Stanley Access Investing	5,000	0.30
Betterment	none	0.25
Wealthfront	500	0.25
SigFig	2,000	0.25
Fidelity Go	none	0.24
Acorns	none	0.24
Vanguard Digital Advisor	3,000	0.15
Schwab Intelligent Portfolios	5,000	0.00
SoFi Wealth	1	0.00
Advisory Fee Average		**0.37**
Advisory Fee Median		**0.30**



Source: Company surveys, Form ADV and 13-F filings, and Morningstar research. Data as of Dec. 31, 2021.

[1] Does not reflect potential fluctuations due to account appreciation or depreciation.

[2] Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.

[3] Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.

Exhibit 7 Additional Fee Details (Excluding Premium Offerings)

	Fee Waiver Credit for Underlying Funds?	Additional Details
Acorns	No	$3/month regardless of investing or retirement account size, but fee increases to $5/month for a family plan with additional accounts (for example, UTMA); annual fee would be 0.40%.
Ally Invest	No	Advisory fee is for "Market Focused" portfolios. "Cash Enhanced" portfolios do not charge an advisory fee since they allocate 30% to an Ally high-yield savings account.
Betterment	No	—
Capital One Investing[1]	No	0.99% for $0 to $1 million. The fee then begins to scale down: 0.89% for next $1 million; 0.79% for next $3 million; 0.69% for next $5 million; 0.59% for above $10 million.
Ellevest[2]	No	Monthly subscription plans: Essential ($1/month), Plus ($5/month or $54/year), and Executive ($9/month or $97/year). The Plus plan would be 0.36% of assets for a $15,000 account.
E-Trade Core Portfolios	No	—
Fidelity Go	Yes	Free up to $10,000, $3/month for $10,000-$50,000, 0.35% thereafter. Underlying funds are free.
FutureAdvisor	No	—
J.P. Morgan Automated Investing	No	—
Marcus Invest	Limited	Credit for accrued fees on proprietary ETFs within the Marcus Invest portfolios.
Merrill Edge Guided Investing	No	0.45% for accounts with less than $20,000 (inclusive of linked Bank of America and Merrill Lynch assets), 0.40% for $20,000-$50,000, 0.35% for $50,000- $100,000, and 0.30% for more than $100,000.
Morgan Stanley Access Investing	No	—
Schwab Intelligent Portfolios	No	Requires keeping a significant portion of portfolio assets in a low-yielding cash sweep option.
SigFig	No	No fee for accounts with less than $10,000.
SoFi Wealth	Limited	Proprietary ETF fees waived until mid-2022; no waiver or credit for nonproprietary ETF fees.
Titan	No	$5/month for accounts with less than $10,000, 1% fee thereafter.
UBS Advice Advantage	No	—
Vanguard Digital Advisor	Yes	Vanguard Digital Advisor's 0.20% gross advisory fee comes with a 0.05% credit for underlying fund fees of 0.05%. Thus, the net advisory fee is 0.15%.
Wealthfront	No	If a client gets a friend to open an account, they both get $5,000 managed free for life. If a client gets two friends to open an account, all three get $10,000 managed free for life, and so on.
Wells Fargo Intuitive Investor	No	Fee lowered to 0.30% if robo-advisor account is linked to an existing Wells Fargo bank account within 90 days of robo-advisor account opening.

Source: Company surveys, Form ADV and 13-F filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Does not reflect potential fluctuations due to account appreciation or depreciation.

2. Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.

Our price assessment is holistic and accounts for varied pricing models. We first consider advisory fees, calculating the annual cost for an investor with a hypothetical $15,000 balance. These fees range from zero to 1% annually, with a 0.30% median. Most providers charge clients a fixed percentage of assets under management, with some providers scaling that charge so that accounts exceeding certain thresholds pay less. Others, like Acorns and Titan, charge fixed monthly fees. Titan’s fee structure changes from $5 per month to an asset-based 1% annual fee for clients investing more than $10,000.

We then consider other ways that client assets might be monetized. The next layer of costs is typically the expense ratios levied by the funds that the robo-advisor recommends to clients. In some cases, fund fees may be the first and only layer of fees. For example, Schwab Intelligent Portfolios invests client assets primarily in proprietary funds run by Charles Schwab Investment management, an affiliate of the platform. In other cases, like Fidelity Go and SoFi Wealth, some or all the underlying funds are free. But in most cases, the fees charged by the underlying funds are incremental to the program advisory fees.

Other costs may be less apparent. For example, asset allocation and fund selection choices may result in opportunity costs. Allocations to cash or money market funds could weigh on long-term returns. For example, Schwab Intelligent Portfolios allocates a portion of client assets to a proprietary deposit account. In another example, SoFi has allocated assets to novel, proprietary funds that have underperformed more mundane third-party offerings. For example, from their April 2019 inclusion in SoFi’s offering through March 1, 2022, SoFi Select 500 ETF SFY and SoFi Next 500 ETF SFYX have lagged Vanguard Growth ETF VUG and Vanguard Mid-Cap ETF VO (low-cost, cap-weighted alternatives from the same Morningstar Categories) by 3.4 and 2.7 annualized percentage points, respectively. In these instances, the robo-advisors are typically far more likely to benefit than their clients.

Robo-advisors may also stand to monetize their clients’ trading activity. Many receive payment for order flow. This practice typically involves sending ETF trades to third parties to be executed. The third party will pay the platform for sending trades its way. The amounts are typically trivial—just a sliver of a penny per each share. But the practice can create incentives to increase trading activity.

There are also qualitative criteria we fold into our assessment of price. Transparency is chief among them. Investors should be able to easily understand how much they are paying, exactly what they are paying for, and whether their assets or trading activity are being monetized in ways that are not reflected in headline fees. SoFi clients pay no advisor fee but face cross-selling. Schwab Intelligent Portfolios clients also pay no advisory fee, but the program puts a disproportionate amount of their assets in low-yielding in-house cash accounts that generate revenue for Schwab. Vanguard, on the other hand, provides a model of fee transparency. It offers a simple fee calculator and plain-English explanations of how it charges investors, what it charges them for, and what potential conflicts of interest it faces in serving them.

Fairness is another, more-subjective input. The economics of the platform should scale to investors’ benefit. The more they invest, the less they should pay (as a percentage of assets) and the more they should get (in terms of level of service). As it stands today, this sort of investor-friendly practice is not standard—likely because the offerings themselves have yet to achieve sufficient scale to share the benefits with their investor clients.

Risk-Tolerance Questionnaires

The process for most new robo-advisor clients starts with a risk-tolerance questionnaire—a series of questions that attempt to discern the "target risk" potential clients' can endure to achieve their investment goals. This risk-tolerance questionnaire functions as a check on typical retirement need calculations. Such calculations try to simulate how much money a client will require at retirement to support ongoing withdrawals. As a rule of thumb, robo-advisors typically steer younger clients who do not need their money for several years toward portfolios with more stocks and other volatile assets and older investors (or those who need their money sooner) toward portfolios heavier in bonds and other less volatile asset classes. The risk-tolerance questionnaire also attempts to quantify "abandonment risk"—the likelihood of a client selling in a market drawdown. A handful of services, including Acorns and Betterment, skip the risk-tolerance questionnaire and recommend portfolios based largely on the client's investing horizon and ultimate investment needs. Services like these generally focus on limiting abandonment risk through behavioral coaching.

The questionnaires of robo-advisors that do offer them vary in depth and breadth. Merrill Edge Guided Investing asks only five questions about clients' comfort with market turmoil and their desire to sell assets that have suffered losses; the service, like several others in our report, also allows clients to override their risk-tolerance questionnaire and pick a target-risk portfolio outright. Other services, like UBS Advice Advantage, E-Trade Core Portfolios, and Marcus Invest, also ask only a handful of questions, but some services' inquiries go much deeper. Schwab Intelligent Portfolios asks more than a dozen questions that branch depending on the prospect's responses—asking, for example, what clients do when their investments declined by at least 20% in a single year, if applicable. Although Fidelity Go defaults to allowing clients to pick their own risk tolerance, it offers a series of 10 additional questions that may recommend a different risk-tolerance level.

Vanguard stands out for its research-based approach, thanks to its use of third-party provider Capital Preferences. It presents investors with six scenarios of varying upside potential to gauge their risk aversion, loss aversion, and decision consistency. Based on responses to these scenarios, Vanguard assigns each investor a decision consistency score between 1 and 100 and a risk score between 1 and 100 and utilizes these inputs along with others, like age and goals, to create personalized glide paths.

Portfolio Construction

Robo-advisors tend to follow similar portfolio construction strategies. Some prominent exceptions aside, most focus on building a balanced portfolio that offers broad, low-cost exposure to major asset classes. Portfolios typically span at least five major risk levels, ranging from equity-focused portfolios for younger or more aggressive investors to bond-focused portfolios for older or more conservative investors.

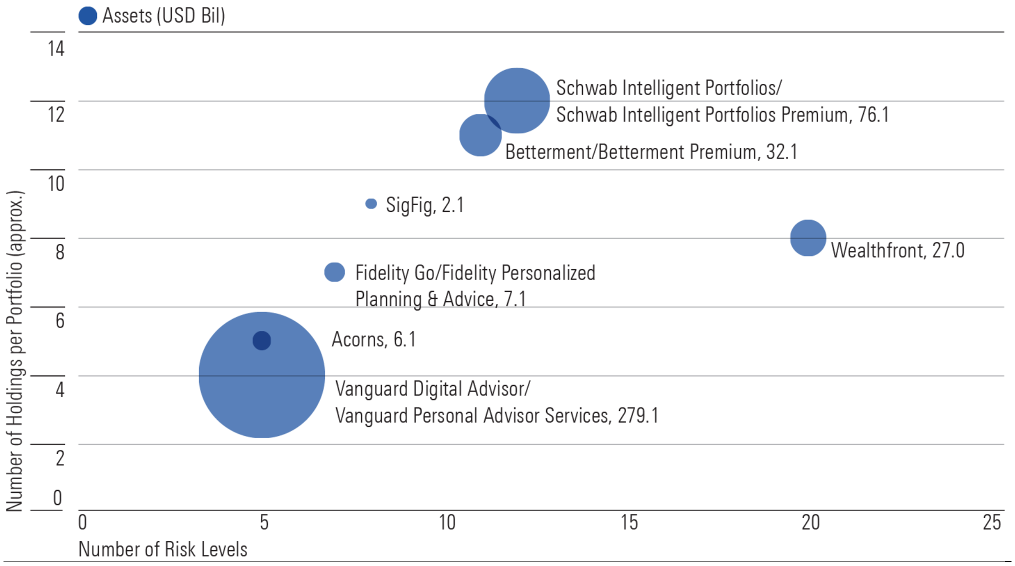
Despite these similarities, the robo-advisor market is not monolithic. Nuances in the way each program approaches fund selection, asset-class exposure, and portfolio maintenance can lead to different results.

Our analysis doesn't prescribe the best way to tackle these topics; instead, we look for a clearly articulated investment thesis that draws on rigorous research and steers clear of problematic strategies such as market-timing.

Simple vs. Complex

Some providers stick with a handful of funds representing broad asset classes. For example, Vanguard Digital Advisor holds just four ETFs, focusing on U.S. stocks, U.S. bonds, international stocks, and international bonds. At the other end of the spectrum, Schwab Intelligent Portfolios draws on more than 50 different funds pulled from as many as 20 Morningstar Categories—including gold, commodities, real estate, emerging-markets debt, and fundamental index funds that favor value-priced stocks in a wide range of asset classes.

Exhibit 8 Simple vs. Complex: Number of Holdings per Portfolio and Risk Levels for Selected Robo-Advisors



Source: Company surveys, Form ADV filings, and Morningstar research. Data as of Dec. 31, 2021.

There is no right answer to how many asset classes one should include in a diversified portfolio. However, most robo-advisors' target clientele leans toward younger investors with smaller account balances. Investors fitting that profile can often benefit from simplicity and shouldn't feel compelled to get exposure to every single asset class.

Exhibit 9 Asset Classes Used as Underlying Holdings

✓ Has capability or attribute, blank if not ⊗ Insufficient portfolio data disclosed to determine asset class exposure

	Bank-Loan Funds	Commodities	Dividend Yield	Gold	High-Yield Corp	International Bond	Mortgage-Backed Securities	Muni Bonds	REITs	TIPS
Acorns										
Ally Invest			✓				✓	✓		
Betterment/Betterment Premium				✓		✓		✓		✓
Capital One Investing[1]			✓			✓		✓		✓
E-Trade Core Portfolios	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Ellevest[2]			✓	✓				✓	✓	✓
Fidelity Go/ Fidelity Personalized Planning & Advice								✓		
FutureAdvisor			✓	✓	✓	✓		✓	✓	✓
J.P. Morgan Automated Investing									✓	
Marcus Invest					✓			✓	✓	
Merrill Edge Guided Investing					✓	✓	✓	✓		
Morgan Stanley Access Investing									✓	✓
Schwab Intelligent Portfolios/ Schwab Intelligent Portfolios Premium	✓		✓	✓	✓	✓	✓	✓	✓	✓
SigFig						✓		✓	✓	✓
SoFi Wealth			✓		✓			✓		✓
Titan										
UBS Advice Advantage					✓	✓				
Vanguard Digital Advisor/ Vanguard Personal Advisor Services						✓				
Wealthfront	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wells Fargo Intuitive Investor	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

Source: Company surveys, Form ADV filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.

2. Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.

X E-Trade and Wells Fargo do not disclose sufficient portfolio data to determine their asset-class exposures.

Static vs. Dynamic

The typical robo-advisor defaults investors into a portfolio that provides a static stock/bond split to match the investor's risk tolerance. The portfolios often come in increments of 10 percentage points, with portfolio weightings of 90% stocks and 10% bonds, 80% stocks and 20% bonds, or 60% stocks and 40% bonds, for example. Managers of those portfolios—if there are even any named—run them as stand-alone funds and hew tightly to the prescribed stock/bond split. The onus falls to investors to derisk their portfolios over time, either by manually opting into more-conservative options or by retaking the investment risk questionnaire. (To their credit, some robo-advisors such as Betterment and Fidelity Go automatically prompt investors to retake the risk-tolerance questionnaire at least once per year.)

A few providers—notably Betterment and Vanguard Digital Advisor—also offer "glide paths" to move their clients from more aggressive to more conservative allocations as they age, similar to a target-date fund. Vanguard maps each client to more than 300 possible glide path options tailored to personal circumstances, taking multiple variables into consideration (risk attitude, loss aversion, current age, retirement age, marital status, and single-stock exposure) to optimize the asset allocation and glide path. Similarly, Betterment starts with recommended portfolio allocations for different types of goals and levels of risk tolerance. As a given goal's time horizon shortens, it gradually reduces the portfolio's risk level. In most other programs, though, investors may see their asset allocations shift suddenly (with potential tax implications) should they choose to change their risk-tolerance level.

Active, Passive, and Customized Offerings

Although low-cost index-tracking ETFs reign supreme across most portfolios, a few offer exposure to actively managed open-end funds, individual stocks, or even closed-end funds. At one extreme, Titan only offers three concentrated, actively managed equity strategies and a cryptocurrency fund. Morgan Stanley Access Investing provides clients with a wide variety of investing portfolios, many of which use pricey and gimmicky thematic investments that have dubious value to an investor saving for retirement. The Performance Seeking portfolios, though they include a suite of traditional low-cost ETFs, otherwise offer specific "thematic tilts" that provide exposure to niche funds like EMQQ Emerging Markets Internet & E-Commerce ETF EMQQ and Global X Robotics & Artificial Intelligence ETF BOTZ.

Less extreme are Betterment and Wealthfront, which give customers the option of building customized portfolios. Wealthfront customers can change the recommended asset mix and/or add individual ETFs to their accounts. Investors with at least $100,000 in taxable money can opt for direct indexing or a risk parity strategy, while those with a balance of at least $500,000 can opt for a smart-beta strategy. Similarly, Betterment investors can use the recommended portfolio as a starting point but then adjust the individual asset-class weights or underlying holdings. Before making any changes, Betterment provides customers with feedback on the potential impact on portfolio diversification and risk.

Exhibit 10 Overall Investment Approach and Options Available

✓ Portfolio ⊗ Insufficient portfolio data disclosed to determine investment approach

	Actively Managed or Thematic Funds	Custom/Flexible Portfolios	Growth Tilt	Index Funds	Risk Parity	Strategic Beta	Sustainable/ ESG	Value Tilt	Primary Fund Providers Used
Acorns				✓			✓		iShares
Ally Invest				✓			✓		iShares, Vanguard
Betterment/Betterment Premium	✓	✓		✓		✓	✓	✓	iShares, Vanguard
Capital One Investing[1]	✓		✓	✓		✓	✓	✓	iShares, Vanguard
E-Trade Core Portfolios				✓		✓	✓		⊗
Ellevest[2]				✓			✓	✓	iShares, Vanguard
Fidelity Go/ Fidelity Personalized Planning & Advice				✓					Fidelity
FutureAdvisor				✓		✓	✓	✓	iShares, Vanguard, SPDR
J.P. Morgan Automated Investing				✓		✓	✓		J.P. Morgan
Marcus Invest				✓		✓	✓	✓	iShares, Vanguard, Goldman Sachs
Merrill Edge Guided Investing				✓			✓		iShares, Vanguard, SPDR
Morgan Stanley Access Investing	✓			✓			✓		iShares, SPDR, TIAA-CREF, others
Schwab Intelligent Portfolios/ Schwab Intelligent Portfolios Premium		✓		✓				✓	Schwab, Vanguard
SigFig				✓					iShares, Vanguard, Schwab
SoFi Wealth			✓	✓					SoFi, iShares, Vanguard
Titan	✓		✓						n/a
UBS Advice Advantage	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Vanguard Digital Advisor/ Vanguard Personal Advisor Services	✓	✓		✓			✓		Vanguard
Wealthfront	✓	✓	✓	✓	✓	✓	✓	✓	Vanguard, iShares, Schwab
Wells Fargo Intuitive Investor	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

Source: Company surveys, Form ADV filings, and Morningstar research. Data as of Dec. 31, 2021.

[1] Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.

[2] Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.

k UBS does not disclose sufficient portfolio data to determine its investment approach. E-Trade and Wells Fargo do not disclose information about their underlying fund holdings.

Value vs. Growth

Providers also differ in the extent to which they favor value- or growth-oriented strategies. SoFi, in particular, has a pronounced growth bias. Its model portfolios include growth ETFs for its large- and mid-cap exposure; these two funds together account for nearly two thirds of equity exposure in the model portfolios. Several other providers, including Schwab and Betterment, lean more toward value. Within each major asset class, Schwab includes both a basic market-cap-weighted index ETF and a fundamentally weighted ETF. Because their allocations are based on measures such as revenue, cash flow, and dividends, fundamentally weighted ETFs tend to have a value tilt. Wealthfront previously included value factor attributes as part of its smart-beta strategy but recently announced that it is dropping this in favor of a greater focus on companies with strong operating profitability.

ESG Gains Ground

Investors, especially the younger ones who make up robo-advisors' main target audience, have increasingly expressed interest in investment options that incorporate environmental, social, and governance considerations. As a result, just over half of providers surveyed either currently offer an ESG-themed option or are planning to launch one in 2022. IShares ETFs are the predominant, if not the exclusive, building block of almost every ESG-themed portfolio in our robo-advisor survey. One fund in particular, iShares ESG Aware MSCI USA ETF ESGU, makes up a significant portion of equity exposure for all but one robo-advisor in our survey that offers an ESG investing option. Individual results may vary, but ESG funds and sustainability-themed portfolios tend to be more expensive than non-ESG funds and portfolios with similar investment mandates.

U.S. vs. Non-U.S.

At year-end 2021, non-U.S. stocks made up about 40% of global market capitalization. However, most robo-advisors display some sort of home-country bias, which is not uncommon among U.S. investors. Acorns and Merrill target weights of 70% U.S. equity and 30% non-U.S., which is a split often used by larger asset managers in their target-date funds. This weighting acknowledges the diversification benefits of non-U.S. stocks but also recognizes that many investors prefer to hold more U.S. equities. The Schwab Intelligent Portfolios program takes this a step further and offers U.S.-focused options that investors can opt into, though these portfolios still offer international equity exposure between 5% and 15% of total assets.

Offerings from SigFig and Ally Invest hew more closely to the global market cap, with each maintaining a 60/40 U.S./non-U.S. split. Vanguard Digital Advisor takes it a step further and does an even 50/50 split, which in effect overweights non-U.S. stocks, though this dynamic would flip if non-U.S. stocks became more prominent in the global market cap. Morgan Stanley Access Investing's 55% non-U.S. equity stake is even more aggressive.

The take-home point for investors is that nearly all robo-advisors offer some degree of international diversification, but the amount varies significantly by provider.

Municipal Bonds

Tax management is another key difference. As discussed elsewhere, some but not all robo-advisors offer tax-loss harvesting, but providers also differ in the degree to which tax considerations impact portfolio construction. Acorns and Vanguard Digital Advisor do not include municipal-bond options in their portfolios, making them a better fit for investors in lower tax brackets and/or those saving in tax-deferred retirement accounts. Most other providers offer different portfolios of the same risk level tailored to taxable or tax-free accounts. SigFig, for example, only adds dividend-oriented REITs to tax-advantaged accounts while reserving municipal bonds for taxable portfolios. Similarly, most other providers lean heavily on municipal-bond funds in portfolios geared toward investors in taxable accounts. In almost every case, investors opting for these accounts will get municipal-bond allocations regardless of their tax brackets, which may not be ideal for every situation.

Cash Is Trash?

Whether conservative, moderate, or aggressive, robo-advisor portfolios typically allocate 3% of assets or less to cash. Paltry nominal and negative real returns from cash have pushed some robo-advisors toward bond substitutes even in conservative portfolios. SigFig allocates up to 15% of assets to short-term Treasuries, SoFi holds up to 30% in a short-term bond fund (plus an additional 5% to a short-term TIPs fund), and Acorns makes liberal use of ultrashort-term bond funds in its conservative portfolio, though its moderate and aggressive portfolios do not include cash.

Along with Schwab Intelligent Portfolios, Ally Invest is one of the few robo-advisors with large cash allocations. It offers both Market Focused portfolios, which allocate 2% to cash and have a 0.30% annual advisory fee, and Cash Enhanced portfolios, which allocate 30% to cash but have no advisory fee. The cash-heavy portfolios primarily target Ally's risk-averse customers who already have most of their assets at the bank. The cash portion provides ballast while earning a competitive annual rate (0.50% to 0.55% recently) versus other high-yield savings accounts, albeit not enough to beat inflation at present.

Schwab Intelligent Portfolios' hefty cash allocations are more problematic. Even the lowest cash allocation (6% of assets) is out of step with other managed investment portfolios. The typical fund in the allocation—50% to 70% equity Morningstar Category holds less than 5% of its assets in cash, while most target-date funds hold about 3.5% in cash across their vintages. In addition, Schwab Bank currently pays an annual percentage yield of just 0.05%, compared with about 0.50% for Ally Invest.

Granted, higher-than-average cash allocations can pay off at times. Schwab's portfolios likely held up better than those of most other robo-advisors during the coronavirus-driven bear market in 2020's first quarter, as well as other periods of market jitters, such as late 2021 and early 2022.

Those periods are exceptions, though. More often, cash is a drag on returns that detracts from investors' long-term results, especially in an era of low interest rates and resurgent inflation.

FOMO on Cryptocurrencies

With cryptocurrencies moving more into the mainstream, many robo-advisors are taking a close look at whether they should include them as an option for clients' portfolios. Not coincidentally, cryptocurrency is a huge area of interest for the younger investors who make up the core audience for most robo-advisors.

Most of the robo-advisors we interviewed are actively considering adding cryptocurrency exposure to their platforms, but at this point Wealthfront is the only major one to include a cryptocurrency option. (Titan Invest, which is much smaller, offers an actively managed cryptocurrency portfolio that seeks to outperform the Bitwise 10 Large Cap Crypto Index over a three- to five-year time horizon.) Wealthfront started offering crypto exposure in July 2021 and now gives customers the option of investing up to 10% of their assets in bitcoin and/or two of the largest and most established cryptocurrencies.

In addition, Betterment recently announced plans to acquire Seattle-based cryptocurrency manager Makara. After the acquisition closes, Betterment will offer customers access to diversified, actively managed cryptocurrency portfolios alongside the traditional investments on its platform. Similarly, Acorns now allows clients to invest up to 5% of assets in a bitcoin ETF.

While investor interest in cryptocurrency has soared, it is among the most volatile asset classes in Morningstar's database and has been subject to both dizzying highs and sudden drawdowns of 20% or more. Bitcoin, for example, dropped nearly 50% between November 2021 and January 2022. This extreme risk profile can pay off over time for investors willing to HODL (hold on for dear life), but robo-advisor investors should think carefully about whether they can tolerate the risk before adding cryptocurrency to their portfolios.

Financial Planning Services

Whereas digital investment management is limited to algorithmic-driven portfolio management, a true advisory offering should also include key financial planning features, such as helping customers set savings goals like planning for retirement while managing their debts and minimizing taxes, and then later providing advice on how best to draw down assets during retirement.

However, few robo-advisors live up to this ideal. The majority focus on digital investment management with a few financial planning features added to the mix. The offers from Acorns and Ally Invest are typical. Ally provides various savings calculators and allows users to designate savings "buckets" for specific goals, while Acorns has some basic calculators for retirement savings, debt reduction, and compound interest.

Exhibit 11 Financial-Planning Services Offered

	Limited (registered reps and/or basic online tools)	**Extended** (extensive online tools and calculators)	**Comprehensive** (Access to CFPs)
Acorns	✓		
Ally Invest	✓		
Betterment		✓	
Betterment Premium		✓	✓
Capital One Investing[1]	✓		
E-Trade Core Portfolios	✓		
Ellevest[2]		✓	✓
Fidelity Go	✓		
Fidelity Personalized Planning & Advice[3]		✓	✓
FutureAdvisor	✓		
J.P. Morgan Automated Investing	✓		
Marcus Invest	✓		
Merrill Edge Guided Investing	✓		
Morgan Stanley Access Investing	✓		
Schwab Intelligent Portfolios	✓		
Schwab Intelligent Portfolios Premium		✓	✓
SigFig[3]		✓	
SoFi Wealth[3]		✓	✓
Titan	n/a		
UBS Advice Advantage	✓		
Vanguard Digital Advisor		✓	
Vanguard Personal Advisor Services		✓	✓
Wealthfront		✓	
Wells Fargo Intuitive Investor	✓		

Source: Company surveys, Form ADV Part II filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.
2. Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.
3. Not all of the provider's financial advisors have earned the CFP designation.

The most advice-oriented providers offer more comprehensive financial planning tools, ranging from online-only counsel (such as Wealthfront's) to on-demand access to human financial advisors (Betterment, Fidelity Personalized Planning & Advice, SoFi Wealth, Schwab Intelligent Portfolios Premium, and Vanguard Personal Advisor Services). However, the degree of access and advisors' qualifications vary.

In most cases, comprehensive financial planning is only available for investors who pay up for premium-level services. SigFig and SoFi Wealth are two exceptions. As part of its basic paid service, SigFig offers both on-demand phone support and access to an advisor for more complicated requests (with no additional paid tier for that offering). However, its advisors are only required to hold Series 65 licenses;

not all of them hold the CFP designation. SoFi offers clients access to financial advisors by phone, virtual meetings, and electronic messages at no extra charge. SoFi's advisors must have Series 65 licenses and either have the CFP designation or be actively working toward it.

Among paid premium services, asset-based advisory fees are the most common pricing structure. Fees range from 0.30% of assets for Vanguard Personal Advisors Services (which requires at least $50,000 in assets) to 0.50% for Fidelity Personalized Planning & Advice (which is more accessible with a $25,000 minimum). Betterment lands in the middle with a 0.40% asset-based fee (albeit with a steeper minimum of $100,000). However, investors who do not have enough assets to qualify for this service have the option of purchasing on-demand financial planning packages (typically priced at $399 per hour).

Exhibit 12 Annual Advisory Fees for Selected Premium Offerings

	Minimum Investment Amount	Annual Advisory Fee (%)	Additional Details
Betterment Premium	$100,000	0.40%	Investors who don't meet the asset minimum required for Premium service also have the option of purchasing on-demand financial planning packages (typically priced at $399 per hour).
Ellevest[1]	n/a	n/a	Various coaching packages are available as a supplement to subscription-based packages. Coaching packages generally range from about $150 to $300 per session. Subscription customers can pay an additional fee ranging from about $1,000 to $1,600 per year for unlimited access to a financial planner with the CFP designation.
Fidelity Personalized Planning & Advice	$25,000	0.50%	
Schwab Intelligent Portfolios Premium	$10,000	n/a	$300 one-time planning fee plus ongoing fees of $30 per month
Vanguard Personal Advisor Services	$50,000	0.30%	

Source: Company surveys, Form ADV and 13-F filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Morningstar is a minority owner of Ellevest, Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.

Similarly, Ellevest also offers various coaching packages as a supplement to its subscription-based packages.[4] The coaching packages range in price from about $150 to $300 per session and cover topics such as budgeting, career planning, entrepreneurship, debt repayment, homebuying, and retirement planning. In addition, Ellevest offers subscription customers unlimited access to a financial planner with the CFP designation for an additional fee ranging from about $1,000 to $1,600 per year.

Schwab Intelligent Portfolios Premium stands out for its flat fee structure, which includes a $300 one-time planning fee plus ongoing fees of $30 per month. That would translate into a relatively high fee for smaller accounts, but it is a better deal for investors with higher account balances.

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[4] Morningstar is a minority owner of Ellevest.

Human access aside, robo-advisors' digital investment advice is broadly similar in most cases, as discussed in the Portfolio Construction section above. The range of financial planning services offered, on the other hand, varies widely. Investors should therefore think carefully about what type of financial planning services might add the most value to their own situations, as well as how much they are willing to pay for premium services.

Finally, investors should keep in mind that there is no standard licensing or educational requirement for financial advisors. Thus, it is worth digging into the qualifications that each robo-advisor requires for its human advisors. Those with the CFP designation are the most reliable bet for comprehensive, well-informed financial advice.

Features and Benefits

At the most basic level, individuals who sign up for a robo-advisor can expect to get digital investment management, which typically takes the shape of a diversified portfolio made up of low-cost, passively managed mutual funds or ETFs. Nearly every robo-advisor offers a range of portfolios with different risk levels.

Automatic rebalancing is an essential feature—without it, investors would have to manually adjust their portfolio holdings to keep their asset allocations in line with the original targets. Except for Titan Invest, which offers actively managed stock-only and cryptocurrency portfolios, every robo-advisor we looked at provides automatic rebalancing as a core part of its service offering. Most robo-advisors use a threshold for rebalancing, meaning they buy and sell a portion of underlying holdings to bring the portfolio back in balance if a major asset class drifts either higher or lower than its original target by a certain amount (such as 5 percentage points).

Exhibit 13 Key Features and Benefits

	Aggregation of Outside Accounts	Automatic Rebalancing	Drawdown/ Retirement Income Advice	Multiple Goal Planning	Tax-Loss Harvesting
Acorns		✓			
Ally Invest		✓		✓	
Betterment/Betterment Premium	✓	✓		✓	✓
Capital One Investing[1]	✓	✓	✓		✓
E-Trade Core Portfolios		✓			
Ellevest[2]	✓	✓		✓[3]	
Fidelity Go/ Fidelity Personalized Planning & Advice	✓	✓			
FutureAdvisor	✓	✓			✓
J.P. Morgan Automated Investing		✓			
Marcus Invest		✓			
Merrill Edge	✓	✓			
Morgan Stanley Access	✓	✓			✓
Schwab Intelligent Portfolios/ Schwab Intelligent Portfolios Premium	✓[4]	✓	✓	✓[4]	✓[5]
SigFig	✓	✓			✓
SoFi Wealth		✓		✓	
Titan		n/a			
UBS Advice Advantage	✓	✓		✓	✓
Vanguard Digital Advisor/ Vanguard Personal Advisor Services	✓	✓		✓	
Wealthfront	✓	✓		✓	✓
Wells Fargo Intuitive Investor		✓			✓

Source: Company surveys, Form ADV filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.
2. Morningstar is a minority owner of Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.
3. Multiple goal planning only available for Executive members.
4. Account aggregation and multiple goal planning only available for Premium members.
5. Tax-loss harvesting only available for accounts of $50,000 and above.

Tax-loss harvesting, which involves selling securities to realize capital losses that can be used to offset realized gains, is another popular feature. To implement this strategy, robo-advisors typically need to designate more than one underlying holding that can be used for each asset class. If the program sells one holding to take advantage of tax losses, it can then replace it with a similar fund in the same asset class. (To avoid running afoul of wash-sale rules, the replacement fund can't be substantially identical to the sold holding, though.)

The need for a stable of similar but not substantially identical funds in the same asset class highlights the drawbacks of relying only on proprietary funds. Fidelity Go and Vanguard Digital Advisor are two of the larger players that do not currently offer tax-loss harvesting. Not coincidentally, both programs rely on a limited lineup of inhouse funds. Fidelity uses a list of nine Fidelity Flex funds as building blocks for portfolios of various risk levels, while Vanguard uses only four Vanguard funds to build an infinite number of customized portfolios and glide paths. The lack of tax-loss harvesting capabilities is a significant drawback to these otherwise competitive programs, although Vanguard plans to add this feature to its premium service later this year.

One key need that most robo-advisors do not currently fill is helping investors figure out how to draw down assets during retirement. To be sure, their target audience tends to be younger investors. But with more individuals reaching retirement age each year, this will become increasingly critical.

Schwab Intelligent Portfolios is currently the only major robo-advisor that offers comprehensive advice on retirement income.[5] Its program helps investors determine how much they can afford to withdraw from their portfolios and schedule recurring withdrawals from both taxable and tax-deferred accounts, such as IRAs. The program also incorporates required minimum distributions, which apply to investors age 72 and older, who must withdraw a certain amount each year from accounts such as IRAs and 401(k)s based on standard life-expectancy formulas. Schwab's program also considers the order of withdrawals from various types of accounts to minimize taxes.

Account aggregation, which involves setting up digital links to assets held outside the robo-advisor, is another feature that most investors would probably find useful. Customers can typically set up this feature by providing information for the outside account, allowing the program to pull in updated account values and asset-allocation levels for all their assets, not just those managed by the robo-advisor. Having access to this information can help robo-advisor programs provide more accurate advice on savings needed, appropriate asset allocations, and progress toward investment goals.

Finally, some robo-advisors offer a variety of other bells and whistles, such as cash management, career coaching, and spending rebates. These features can be useful but should probably play a secondary role for investors trying to determine which provider to use.

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[5] Capital One Investing also offers advice on retirement drawdown strategies but is much smaller. Morningstar was previously a minority owner of Capital One Investing predecessor United Income, which was acquired by Capital One in 2019.

Exhibit 14 Other Features and Benefits

	Asset Location Advice	Career Coaching	Cash Mgmt or Savings Account	Checking Account	College Savings/ 529 plan	Cash-Back Credit Card	Debit Card	Health Savings Account	Loans (margin or other)	Micro-Savings/ Spending Roundups	Portfolio Review	Rebate Program
Acorns		✓[1]		✓	✓[2]		✓			✓		✓
Ally Invest			✓	✓			✓					
Betterment	✓		✓	✓				✓				
Capital One Investing[3]			✓	✓			✓					
E-Trade Core Portfolios			✓	✓			✓					
Ellevest[4]	✓	✓	✓	✓			✓			✓		✓
Fidelity Go/PP&A			✓			✓						
FutureAdvisor			✓	✓							✓	
J.P. Morgan Automated Investing			✓	✓			✓					
Marcus Invest			✓									
Merrill Edge Guided Investing			✓									
Morgan Stanley Access Investing												
Schwab Intelligent Portfolios/ Schwab Intelligent Portfolios Premium			✓	✓							✓[5]	
SigFig											✓	
SoFi Wealth		✓	✓	✓					✓			
Titan												
UBS Advice Advantage					✓						✓	
Vanguard Digital Advisor/ Vanguard Personal Advisor Services	✓		✓									
Wealthfront	✓		✓	✓	✓		✓		✓			
Wells Fargo Intuitive Investor			✓						✓			

Source: Company surveys, Form ADV filings, and Morningstar research. Data as of Dec. 31, 2021.

1. Offers access to job finder tool from Zip Recruiter.
2. Offers UTMA and UGMA accounts.
3. Morningstar was previously a minority owner of United Income, which was acquired by Capital One in 2019.
4. Morningstar holds a minority ownership position in Ellevest Inc. Ellevest has separately engaged Morningstar Investment Management to provide certain services, including licensing the Wealth Forecast Engine.
5. Portfolio review only available for Premium members.

Robo-Advisors vs. Traditional Advisors

Digital investment advice can be a compelling option for many investors, particularly those with smaller account balances. There are some key differences in the types of services each provides, though.

The most obvious difference is whether an actual person mediates the investment advice—albeit with varying degrees of reliance on algorithms—or if the algorithm exclusively provides it. In the traditional model, financial advisors provide customized investment management and financial planning services. They also meet with clients on a regular basis, typically at least once or twice a year. More informally, they are often available for impromptu calls to advise on key investment decisions or to provide reassurance during periods of market turbulence.

With the advent of digital investment advice, though, many investors may not feel the need to meet with a human financial advisor. In fact, younger generations who grew up with social media and the internet at their fingertips often prefer not to meet with anyone in person.

Many robo-advisors have tried to bridge the gap between digital and human investment advice by incorporating real-time behavioral nudges via text or email to encourage their users to stick with their investment plans and continue taking the steps needed to meet their goals.

Another obvious difference between robo-advisors and traditional advisors is the degree of customization and hands-on investment management. Decades ago, financial advisors focused on adding value by picking stocks or actively managed mutual funds for their clients. With the shift toward fee-based advisory models, however, hands-on investment management is no longer a primary part of the value proposition for most financial advisors. Instead, financial advisors can add the most value by helping clients sort through other complex financial issues, such as insurance planning, estate planning, stock-based compensation programs, and comprehensive tax planning.

However, many investors at the lower end of the mass affluent tier (which Cerulli Associates defines as those with investable assets from $500,000 to $2 million) may not need this scope of advice. For those who do not need complex financial planning, cost is a key differentiator, and robo-advisors have a significant cost advantage. An investor with a $500,000 portfolio, for example, might pay about 1% of assets per year to a traditional financial advisor, which translates into $5,000 per year. An investor with the same $500,000 portfolio who paid a typical level of fees for a robo-advisor (about 0.30% of assets), in contrast, would pay only $1,500 per year. Moreover, many financial advisors will not accept new clients unless they have a higher level of investable assets.

Another way to frame the price of digital advice versus more traditional advice is to compare it with the average cost for a stand-alone financial plan, which is a comprehensive analysis of a client's goals, income, assets, debts, planned expenses, retirement savings, and anticipated retirement spending. Advisors often use sophisticated financial planning software to enter detailed information and assumptions, which are then translated into a year-by-year projection of the client's financial information. This type of software also typically incorporates Monte Carlo analysis, a statistical model that simulates thousands of different potential outcomes to estimate the probability of success or failure for a given plan. Based on research from Kitces.com, advisors in 2019 typically charged $2,400 for a comprehensive financial plan along these lines.

Several robo-advisors (including Betterment, Schwab, Wealthfront, and Vanguard) allow customers to create similar projections but at a much lower cost. Investors might still be willing to pay up for a human financial advisor but should keep an eye on whether the value of the services they are receiving is worth the cost.

Conclusion

The robo-advisor industry may be more than a quarter century in the making, with many leading providers today getting their start around 15 years ago, but the industry is just now maturing. Services are adding new, valuable features each year, if not each quarter, and competing on cost. Room for improvement remains, though. A few robo-advisors are still pricey, transparency is often lacking, and some portfolio options are better than others.

The trend toward adding a human touch to robo-advisor offerings suggests the future will be far from exclusively digital. Sound investing, withdrawals, and holistic financial planning are as much art as science. In that sense, there will always be a role for traditional advisors, especially with clients whose needs are complicated. New investors, however, whose modest assets precluded them from receiving financial advice in the past, now have excellent options for getting started through robo-advisors.

Editor's Note: This paper has been updated to explain Ally's upcoming offering.

Disclosures

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