

# BRINGING TRANSPARENCY TO ROBO INVESTING

EDITION 22

## *The Robo Report*<sup>®</sup> Fourth Quarter 2021



**W**e are proud to publish the 22nd edition of the *Robo Report*<sup>®</sup> covering the fourth quarter of 2021, and the eighth edition of the *Robo Ranking*<sup>®</sup>. This *Report* is a continuation of an ongoing study that monitors well known robo advisors. We strive to provide a reliable resource for both investors and professionals interested in the digital advice industry.

### *Highlights:*

- *Thanks to strong performance, an undeniably strong suite of products and services, as well as little to no management fees, SoFi has maintained its spot as the Best Overall Robo Advisor (pg. 7)*
- *Consistent performance, a competitive fee structure, and useful digital planning tools are the hallmark of a good robo advisor and why Fidelity Go is ranked runner-up for Best Overall Robo (pg. 7)*
- *Betterment is a great choice for first-time investors due to its intuitive user experience and simplicity (pg. 9)*
- *Domestic bias defined winning portfolios in 2021; Schwab, Zacks, and Marcus benefit (pg. 15)*
- *The winning long term fixed income portfolios held some mix of extended duration or high-yield bonds (pg. 17)*

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*All supporting data can be found online at [backendbenchmarking.com/data](https://backendbenchmarking.com/data)*

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## *Executive Summary*

This edition of the *Robo Report*® tracks 58 accounts at 35 different providers and includes the *Robo Ranking*®, the most comprehensive analysis of robo advisors available. The *Ranking* includes both qualitative factors, such as access to advisors and financial planning features, as well as the performance metrics of our accounts held at each provider.

### *Industry Update: The Decline of Independent Robos*

2021 was a year of continued consolidation and maturation within the digital advice market. The robo advisor first emerged in the wake of the financial crisis. In 2015, Schwab and Vanguard both launched robo advisors and were followed by the largest banks and brokerages in the country in the following years. What used to be a niche product has become a standard option at most of the major consumer financial firms in the country. Many early entrants to the market were acquired by larger firms looking to quickly add a robo advice product. Meanwhile, many smaller firms never reached the scale necessary to operate profitably in this business due to tight margins and have since closed.

This quarter, UBS announced the acquisition of Wealthfront, leaving only a small handful of successful robo firms that remain independent. This acquisition is indicative of how the industry has matured and how founders and investors are looking for their exit.

Betterment remains independent but saw its founder Jon Stein leave the company earlier this year. SoFi, a neo-bank with a robo advisor offering, went public through a SPAC earlier this year. Meanwhile, Acorns announced an

acquisition by a SPAC, but later abandoned the deal. Personal Capital sold to Empower in 2020. This leaves Betterment, micro-investing apps Acorns and Stash, Sallie Krawcheck's Ellevest, and SoFi as the few remaining major independents in the space. Robo advisors have fundamentally changed financial advice by making professional advice available to anyone and making quality financial plans widely available at little or no cost. In the end, robo advice is a story of adoption at major firms, not one of disruption by independent start-ups.

### *SoFi Maintains the Top Spot as Best Overall Robo*

Thanks to strong performance, an undeniably strong suite of products and services, as well as little to no management fees, SoFi has maintained its spot as the Best Overall Robo Advisor. Fidelity Go, a perennially strong performer, backed by strong digital planning capabilities and the option to upgrade to a live-advisor option with Fidelity Personalized Planning and Advice, achieved the runner-up position for Best Overall Robo.

### *Over Five Years: Fidelity Go, SigFig, and Axos Reward Investors with Strong Equity Returns*

When looking at the 5-year period ending December 31st, 2021, Fidelity Go, SigFig, and Axos were the top performers for the half-decade. Common themes amongst these advisors include a bias towards large-cap stocks over mid- and small-cap names, an overweight to growth stocks, and, not surprisingly, a healthy U.S. bias. One interesting note is that when expressing this growth bias, it is not so much that these advisors had specific growth-oriented funds, but rather

that by holding the standard market-cap weighted ETFs, they enjoyed significant returns compared to those robo advisors who deliberately added

value-oriented ETFs to bring portfolios to a more balanced position.



# *The Robo Ranking*<sup>®</sup>

## Bringing Transparency to Robo Investing



**W**e are excited to publish the 8th edition of the *Robo Ranking*<sup>®</sup>. The *Robo Ranking* is the only comprehensive ranking of robo advisors. It examines not only the features and services but also portfolio performance that is sourced from real accounts tracked by Backend Benchmarking. Robo advisors have taken the advice industry by storm, with the larger independent providers continuing to show strong growth and innovative features, and robo advice technology being adopted across banks, brokerages, and other traditional advice firms. Robo advice providers are proving attractive to individual investors in large part due to their significantly lower minimums and costs. Since these products are relatively new to the investment landscape, there is little information available to investors. Here at Backend Benchmarking, our goal is to bring transparency to the digital advice industry to empower investors to seek the best products and services.

### *Introduction*

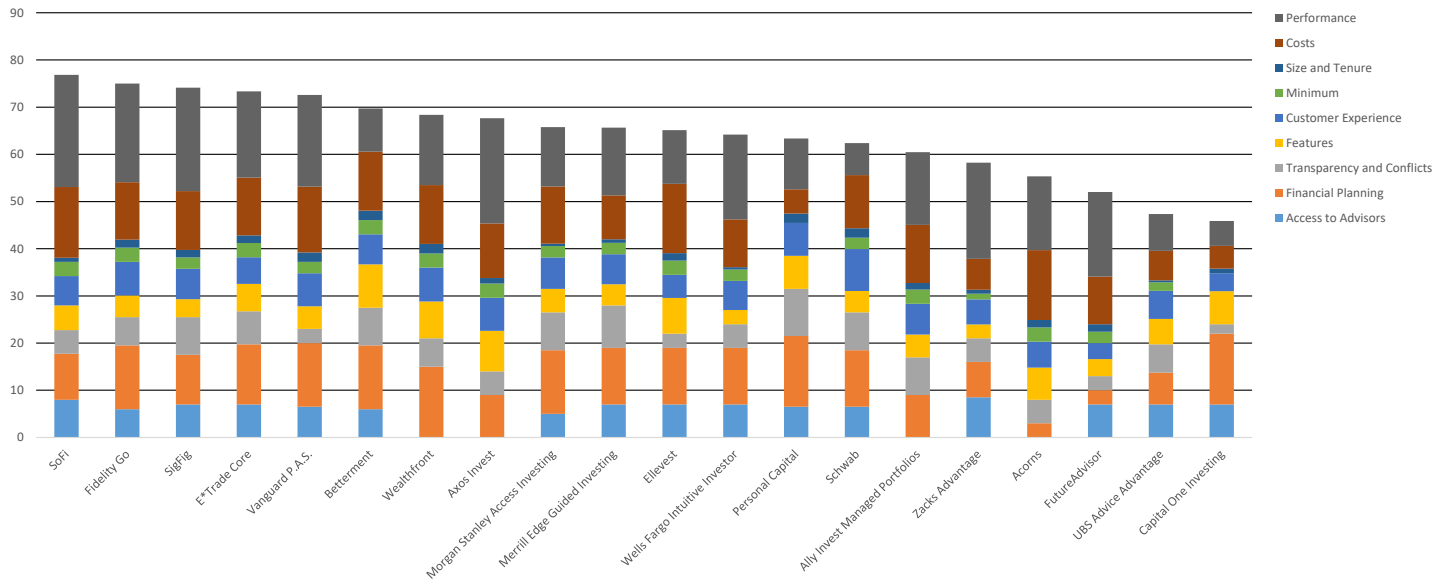
The *Robo Ranking* grades robo advisors across more than 45 specific metrics and is the only examination that includes real and reliable performance data. We scored each robo on various high-level categories, such as features, financial planning, customer experience, access to live advisors, transparency and conflicts of interest, size and tenure, account minimums, costs, and performance. Each metric that we grade is specific and unambiguous.

The *Robo Ranking* is a powerful tool to help those investors who are considering using a digital advisor. Although we rank and give each robo an overall score, we also acknowledge the differences

in individual investors and their situations. To help investors find a product that is right for them, we created sub-rankings to highlight where different products excel. Once investors have identified their needs, the category rankings can help them select a provider that stands out in the areas that are most important to them.

The performance score is partly based on Backend Benchmarking's innovative method to compare globally diversified portfolios called Normalized Benchmarking. A methodology of Normalized Benchmarking can be found on our [website](#). The details of how we created the scores and *Ranking* can also be found on our [website](#).

# Robo Ranking Scores



| Robo Name                       | Access to Advisors | Financial Planning | Transparency and Conflicts | Features | Customer Experience | Minimum | Size and Tenure | Costs | Performance | Total |
|---------------------------------|--------------------|--------------------|----------------------------|----------|---------------------|---------|-----------------|-------|-------------|-------|
| SoFi                            | 8.00               | 9.75               | 5.00                       | 5.25     | 6.20                | 3.00    | 0.87            | 15.00 | 23.78       | 76.85 |
| Fidelity Go                     | 6.00               | 13.50              | 6.00                       | 4.60     | 7.11                | 3.00    | 1.72            | 12.14 | 20.93       | 74.99 |
| SigFig                          | 7.00               | 10.50              | 8.00                       | 3.80     | 6.45                | 2.40    | 1.60            | 12.47 | 21.90       | 74.12 |
| E*Trade Core                    | 7.00               | 12.75              | 7.00                       | 5.80     | 5.66                | 3.00    | 1.60            | 12.26 | 18.25       | 73.33 |
| Vanguard P.A.S.                 | 6.50               | 13.50              | 3.00                       | 4.80     | 7.00                | 2.40    | 2.00            | 13.96 | 19.42       | 72.58 |
| Betterment                      | 6.00               | 13.50              | 8.00                       | 9.17     | 6.40                | 3.00    | 2.00            | 12.50 | 9.16        | 69.72 |
| Wealthfront                     | 0.00               | 15.00              | 6.00                       | 7.80     | 7.20                | 3.00    | 2.00            | 12.50 | 14.85       | 68.35 |
| Axos Invest                     | 0.00               | 9.00               | 5.00                       | 8.60     | 7.00                | 3.00    | 1.20            | 11.54 | 22.32       | 67.66 |
| Morgan Stanley Access Investing | 5.00               | 13.50              | 8.00                       | 5.00     | 6.66                | 2.40    | 0.50            | 12.14 | 12.57       | 65.77 |
| Merrill Edge Guided Investing   | 7.00               | 12.00              | 9.00                       | 4.48     | 6.35                | 2.40    | 0.75            | 9.33  | 14.33       | 65.64 |
| Ellevest                        | 7.00               | 12.00              | 3.00                       | 7.55     | 4.91                | 3.00    | 1.60            | 14.68 | 11.39       | 65.14 |
| Wells Fargo Intuitive Investor  | 7.00               | 12.00              | 5.00                       | 3.00     | 6.20                | 2.40    | 0.50            | 10.12 | 17.96       | 64.18 |
| Personal Capital                | 6.50               | 15.00              | 10.00                      | 7.00     | 6.96                | 0.00    | 2.00            | 5.14  | 10.75       | 63.35 |
| Schwab                          | 6.50               | 12.00              | 8.00                       | 4.55     | 8.88                | 2.40    | 2.00            | 11.27 | 6.78        | 62.37 |
| Ally Invest Managed Portfolios  | 0.00               | 9.00               | 8.00                       | 4.80     | 6.54                | 3.00    | 1.40            | 12.29 | 15.43       | 60.46 |
| Zacks Advantage                 | 8.50               | 7.50               | 5.00                       | 2.96     | 5.30                | 1.20    | 0.83            | 6.56  | 20.37       | 58.22 |
| Acorns                          | 0.00               | 3.00               | 5.00                       | 6.80     | 5.50                | 3.00    | 1.60            | 14.79 | 15.63       | 55.33 |
| FutureAdvisor                   | 7.00               | 3.00               | 3.00                       | 3.60     | 3.40                | 2.40    | 1.60            | 10.07 | 17.93       | 52.00 |
| UBS Advice Advantage            | 7.00               | 6.75               | 6.00                       | 5.39     | 5.94                | 1.80    | 0.42            | 6.26  | 7.80        | 47.36 |
| Capital One Investing           | 7.00               | 15.00              | 2.00                       | 7.00     | 3.80                | 0.00    | 0.98            | 4.81  | 5.28        | 45.87 |
| MAX                             | 10                 | 15                 | 10                         | 10       | 10                  | 3       | 2               | 15    | 25          | 100   |

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## Best Robo Advisors

### Best Overall Robo Advisor

- **Winner: SoFi Invest**
- **Runner-up: Fidelity Go**

SoFi has maintained its top spot for Best Overall Robo Advisor in this edition of the *Robo Ranking*, earning its high scores due to an impressive overall value proposition. SoFi currently does not charge a management fee, provides access to CFP®-credentialed financial planners, and boasts a strong performance record. They won first place amongst the subset of robos assessed for the *Ranking* for both performance compared to the Normalized Benchmark and the portfolio's Sharpe ratio for the 3-year trailing time period used in the *Ranking*. For a detailed look at the drivers of performance for SoFi, please review the commentary for the Performance at a Low Cost award.

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A customer can invest with SoFi for just \$5. Thanks to SoFi's fractional shares, this small sum can be invested in a globally diversified basket of ETFs. Currently, SoFi charges no management fee, while the average robo advisor in this edition of the *Ranking* has a management fee of 0.35%. As has been well-documented, fees can be an under-appreciated detractor from long-term performance. One note on SoFi's low costs: SoFi is backed with significant venture capital, and generating revenues and profits may not be a priority for the company at this stage. If the company shifts focus from acquiring customers to generating profits, it may start to charge

customers for more of its services. That said, in its current form, the SoFi platform is a very attractive option.

One of the most important categories of the Ranking is the 10 points allocated for access to financial advisors. Investors with SoFi can access a team of financial

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*Investors with SoFi can access a team of financial planners without the hurdle of needing a higher minimum account balance or subscribing to a more expensive plan.*

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planners without the hurdle of needing a higher minimum account balance or subscribing to a more expensive plan option, something that cannot be said for many of its competitors. For example, Vanguard Personal Advisor Services offers access to live planners but carries a \$50,000 minimum.

Fidelity Go is ranked the runner-up Best Overall Robo. To construct its portfolio, Fidelity Go uses its Fidelity Flex mutual funds. Although we acknowledge the conflict of interest when a provider relies on proprietary funds, the funds do not have any underlying expense ratios and the account is a perennially strong performer. In 2020, Fidelity changed its fee structure, significantly reducing the effective fee for those with balances below \$50,000. For clients with balances of \$50,000 or higher, the all-in cost of 0.35% is competitive with most other low-cost providers when considering both the management fee and the underlying expense ratios of the funds. Clients with less than \$10,000 are not charged a management fee and those between \$10,000 and \$50,000 are charged a competitive flat-rate fee.



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Fidelity Go offers a robust retirement planning tool in addition to planning for a home and education savings, among other goals. The planning tool is thorough and

allows clients the ability to build out realistic and detailed plans on a goal-by-goal basis. The digital planner at Fidelity Go is a capable tool and is competitive with other top digital planning tools available on the market.

Clients looking for 1-on-1 guidance from a live advisor can upgrade to the Personalized Planning and Advice level, but the fees jump to 0.50% while the minimum increases to \$25,000. This 0.50% fee and increased minimum, although not the lowest on the market, is competitive with most other “hybrid advice” offerings. With this

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*Consistent performance, a competitive fee structure, and useful digital planning tools are the hallmark of a good robo advisor and why Fidelity Go is ranked runner-up for Best Overall Robo.*

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higher-tier service, account holders can work with an advisor to address planning needs, which are not covered by Fidelity Go’s digital tools. Consistent performance, a competitive fee

structure, and useful digital planning tools are the hallmark of a good robo advisor and why Fidelity Go is ranked runner-up for Best Overall Robo.

When we look back at this edition of the *Robo Ranking*, we see many of the same trends that have powered the top *Ranking* scores in the past. Performance, planning options, and costs remain at the forefront.

## *Best Robo for Performance at a Low Cost*

- **Winner: SoFi Invest**
- **Runner-up: Axos Invest**

SoFi and Axos proved to be the most attractive robo advisors from a performance

perspective when looking at the last three years of returns. While the Robo Ranking Study Group of 20

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*SoFi and Axos outperformed by 0.36% and 0.30%, respectively. In fact, they were two of just three robos to beat their Normalized Benchmark.*

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robo advisors underperformed its Normalized Benchmark by an average of -0.93%, SoFi and Axos outperformed by 0.36% and 0.30%, respectively. In fact, they were two of just three robos to beat their Normalized Benchmark - our proprietary process for comparing robos to benchmarks with a comparable equity allocation. Furthermore, these two robos were able to perform strongly while maintaining low fees. SoFi’s platform currently charges no management fee, while Axos charges just 0.24% annually. The combination of a stellar historical record of returns and low fees make these robos winners for the Best Robo for Performance at a Low Cost Award.

When digging into the drivers of returns, SoFi boasts equity-only returns of 22.65%, while the average robo’s stock portfolio returned 20.03% for the 3-year trailing period ending December 31st, 2021. While the Robo Ranking Study Group has just 31% allocated to growth, SoFi boasted a 42% allocation - the highest in the group. Similarly, from a value standpoint, whereas the average

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*This message should be loud and clear to investors: if you are expecting growth-oriented stocks to outperform over the long haul, SoFi is a top choice to express that view.*

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robo has 30% allocated to value stocks, SoFi is allocated to just 25% - the lowest of the group. During the last three years, the Russell 1000 Growth has outperformed the Russell 1000 Value by over 16% on an annual basis for the 3-year trailing period ending December 31st, 2021. This message should be loud and clear to investors: if you are expecting growth-oriented stocks to outperform over the long haul, SoFi is a top choice to express that view. With value being in significant favor for the year-to-date period ending February 22nd, 2022, we expect a new set of robos to be the top performers in future editions. It is possible that combinations of SoFi with allocations to more value-oriented portfolios, like Wealthfront or Betterment, may prove to be prudent from a perspective of balance.

|                               | 3-Year Equity Returns | Growth % | Value % |
|-------------------------------|-----------------------|----------|---------|
| SoFi                          | 22.65%                | 42%      | 25%     |
| Axos                          | 21.12%                | 35%      | 27%     |
| Average of Robo Ranking Group | 20.06%                | 31%      | 30%     |

Axos, on the other hand, has outperformed from posting strong results across the board. To put fixed income returns into context, while the iShares U.S. Core Aggregate Bond ETF (AGG) returned 4.79% annually over the period, Axos' bond portfolio outperformed by about 1%. When looking at the attribution, Axos boasts the highest allocation to corporate bonds of any bond portfolio by a significant margin. In fact, the

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average robo that was included in the *Ranking* held just 18% corporate bonds while Axos held upwards of 72% in corporates. As a result, our Axos account also boasted the highest yield,

with its 30-day SEC yield north of about 2.9%

while the average robo in the *Ranking* universe was roughly 1.8%. Lastly, in light of recent interest rate increases, investors may be wary of Axos bond portfolio's duration, but

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investors can rest assured that Axos' duration of 4.8 years is in the lowest third of the *Ranking* study group. However, if investors become concerned with credit risk, and specifically high-yield bond risk, Axos investors may want to prepare for a bumpy ride. Still, volatility is part of the picture of many investments that prove to eventually outperform over full market cycles.

|                               | Bond Returns | Corporate % | Effective Duration |
|-------------------------------|--------------|-------------|--------------------|
| SoFi                          | 3.96%        | 7%          | 4.8                |
| Axos                          | 5.81%        | 72%         | 4.7                |
| Average of Robo Ranking Group | 4.33%        | 18%         | 5.7                |

### *Best Robo for First-Time Investors*

- **Winner: Betterment**
- **Runner-up: SoFi**

Betterment wins the Best Robo for First-Time Investors award. For a low fee of 0.25% annually, Betterment offers a wide variety of investment options, excellent digital planning tools, and access to CFP®-designated advisors, for either a one-time fee or a subscription to Betterment Premium. Betterment also offers a variety of themed portfolios, including a smart beta portfolio and an income-focused portfolio. However, perhaps most notably,

*Betterment offers three ESG-themed options, including Climate Impact, Social Impact, and Broad Impact.*

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including Climate Impact, Social Impact, and Broad Impact.

We believe Betterment is a great choice for first-time investors due in large part to its intuitive user experience and simplicity. Betterment's user experience includes a combination of an intuitive dashboard and easy-to-use planning features while still having the ability to complete quality goal-based plans. Each goal allows the user to model different inputs, whether deposits, time horizon, or various scenarios for the retirement plan. The ability to model hypothetical changes to a user's financial model can serve as effective education tool - making it particularly attractive for a new investor. Some of the complexity found with other digital planners can be important for more complex financial situations, but can also add unneeded complexity for a first-time investor. Betterment's planner strikes a good balance between necessary complexity to model contribution rates and other inputs and simplicity to help first-time investors not feel overwhelmed while creating a plan.

Finally, with Betterment, a first-time investor can access more sophisticated advice from CFP® advisors available for one-time fees or as part of Betterment Premium. We appreciate the flexibility of this offering to match an investor's needs - especially if they become more complex.

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SoFi earns the runner-up spot for the Best Robo for First-Time Investors. This platform boasts a substantial amount of value at low barriers to start. Users can begin investing with SoFi Invest with just \$5 - making it accessible for nearly all investors. It

charges no management fee, further increasing the attractiveness of the service. Additionally, SoFi is well known for its student loan management services, which means that a first-time investor can handle debt management and investing all under one roof. We like the fact that borrowers can transition from paying down debt to saving and investing in long-term goals all on one platform.

When going deeper into SoFi's platform, SoFi Money offers high-interest savings and budgeting tools to help someone new practice the right personal finance habits. Also, the team at SoFi offers access to financial planners that users can call to ask questions about their money and receive a comprehensive financial plan. SoFi is a lender, an investing firm, and a neo-bank all in one platform. This robust set of product offerings creates a platform where clients can handle many facets of their financial life in a single place.

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*SoFi is a lender, an investing firm, and a neo-bank all in one platform.*

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## ***Best Robo for Digital Financial Planning***

- **Winner: Wealthfront**
- **Runner-up: Personal Capital**
- **Honorable Mention: Schwab Intelligent Portfolios Premium**

While robo advisors have perhaps not disrupted the traditional advice industry as much as once believed, one of the largest contributions robos have made in the industry is the proliferation of the digital financial plan - epitomized by Wealthfront, Personal Capital, and Schwab's Premium version of Intelligent

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*Wealthfront and Personal Capital have the added benefit of making most of their features free to use without being a paid client.*

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Portfolios. There are key themes amongst the winners. First, by combining multiple goals into a single unified plan, the user can experience a holistic view that is intuitive and easy to relate with. Next, the ability to link outside accounts allows this overall view to be accurate by automatically updating the data from outside institutions. Finally, there is a high level of detail available in the plan to model social security, pensions, windfalls, and other real-life events. Our winners, Wealthfront, Personal Capital, and Schwab Intelligent Portfolios Premium, all balance the complexities of financial planning with intuitive dashboards. Wealthfront and Personal Capital have the added benefit of making most of their features free to use without being a paid client.

Wealthfront's tool has specific modules for goals like retirement, education savings, and taking time off to travel. Additionally, Wealthfront can model a home purchase and, with the help of an integration with fintech real estate firm Redfin, it allows Wealthfront to automatically update the estimated value of a user's real estate.

Another feature we like with Wealthfront is Self-Driving Money. Self-Driving Money is a set of automated or semi-automated features to help investors sweep and invest excess cash held in their bank account. This is designed to help users integrate their long-term goals with their month-to-month saving and spending habits. Wealthfront has continued to iterate and improve its planner over the years and it continues to be best-in-class.

The runner-up is Personal Capital. This digital platform stands out for offering a detailed suite of tools that analyze the individual aspects of one's financial life, and, unlike Wealthfront, dissects investments held in outside accounts. The Investment Checkup takes a user's outside investments and compares them to a

recommended portfolio across asset allocation and projected value. Another component is the Retirement Fee Analyzer, which looks to identify expense ratios that may be problematic. Finally, the dashboard displays a net worth graph that allows a user to easily monitor their situation. Personal Capital provides individual modules to answer or analyze common planning issues. It offers the features we look for to customize and model complex situations.

Schwab Intelligent Portfolios wins the honorable mention for this category due to its digital platform offered at the Premium tier, which is a subscription-based version that requires a \$25,000 minimum. The planning features here are powered by MoneyGuidePro, an institutional-quality suite of tools. Importantly, like the other winners in this category, Schwab's plan can integrate multiple goals into a single comprehensive financial plan. Finally, the strong digital planning at Schwab Intelligent Portfolios Premium is augmented by a live planner. These planners hold a CFP® designation and work with the client to guide them through a comprehensive plan. Live planners combined with powerful digital planning make Schwab one of the most compelling planning providers in the robo advice landscape.

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## Best Robo for Complex Financial Planning

- **Winner: Vanguard Personal Advisor Services**
- **Runner-up: Personal Capital**
- **Honorable Mention: Ellevest**

Investors with complex planning needs can greatly benefit from choosing a robo advisor with a strong “hybrid” advice offering. Hybrid offerings that combine strong digital tool-sets

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*Hybrid offerings that combine strong digital tool-sets with access to live planners can help clients create plans to simplify a complex situation.*

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with access to live planners can help clients create plans to simplify a complex situation. Vanguard Personal Advisor Services was an early champion of the hybrid advice model and continues to have

tremendous value for an exceptionally low management fee of just 0.30%. Personal Capital and Ellevest both offer significant value with live planning as well.

With Personal Advisor Services, at a minimum investment of \$50,000, users can work with a live advisor to model multiple financial goals. Also, investors can view a comprehensive illustration of their assets for a full picture. When we consider that traditional financial advice relationships

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often require at least \$250,000 in assets and a 1% management fee, Vanguard Personal Advisor Services has paved the way for a new kind of service. While Vanguard's user interface

is not as sleek and simple as some of its robo competitors, live planners can work one-on-one with clients to set up comprehensive plans.

The runner-up, Personal Capital, combines best-in-class online tools with a team of live advisors at a minimum of \$100,000. However, its fee structure starting at 0.89% is one of the more expensive options. Although not as inexpensive and accessible as Vanguard, Personal Capital does differentiate itself in a few notable areas. There are multiple portfolio strategies, including direct indexing and SRI-themed allocations, while those investing more than \$1,000,000 can receive custom allocations that include private equity investments. From a features perspective, the Retirement Paycheck helps users determine a tax-efficient withdrawal strategy. Although fees are certainly high when compared to the robo universe, it is one of the few platforms to receive a perfect score in financial planning.

Earning the honorable mention in this category is Ellevest. At a \$1,000,000 minimum, Ellevest Private Wealth offers a combination of financial planning, impact investing, and executive coaching that is

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*It is one of the few platforms to receive a perfect score in financial planning.*

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tailored specifically for women. The planning options include CFP®-designated advisors, which is the gold standard for planners. At lower tiers, investors can also purchase access to these services for one-time fees. Through Private Wealth or one-time purchases, investors across the Ellevest platform can access sophisticated advice to handle complex inquiries and situations.



## Robo Ranking Facts (Results as of 12/31/2021)

|   | 3-Year Annualized Return | 3-Year Return Above/Below Normalized Benchmark | 3-Year Sharpe Ratio | Account Minimum   | Advisory Fee  | Weighted Average Expense Ratio |
|---|--------------------------|--|---------------------|---|---|--------------------------------|
| Acorns <sup>1</sup>                           | 14.05%                   | -0.82%   | 0.95                | No minimum  | \$3/month for Personal; \$5/month for Family  | 0.05%                          |
| Ally Invest Managed Portfolios <sup>9</sup>   | 13.41%                   | -1.13%   | 0.97                | \$100   | 0.30% annually; Also offers 'cash-enhanced' portfolio with 30% invested in cash and no management fee   | 0.06%                          |
| Axos Invest <sup>8</sup>                      | 15.67%                   | 0.30%  | 1.02                | \$500   | 0.24% annually  | 0.09%                          |
| Betterment <sup>27</sup>                      | 13.86%                   | -1.66%   | 0.88                | Digital: No minimum; Premium: \$100,000   | Digital: 0.25%; Premium: 0.40%  | 0.09%                          |
| Capital One Investing <sup>16</sup>           | 11.00%                   | -3.63%   | 0.8                 | \$100,000   | 0.99% annually; discounted tiered pricing at higher asset levels  | 0.06%                          |
| E*Trade Core <sup>21</sup>                    | 14.30%                   | -0.41%   | 0.97                | \$500   | 0.30% annually  | 0.05%                          |
| Ellevest <sup>38</sup>                        | 12.81%                   | -1.25%   | 0.9                 | No minimum; Private Client: \$1 million   | \$1/month for Essential; \$5/month for Plus; \$9/month for Executive  | 0.07%                          |
| Fidelity Go <sup>33</sup>                     | 14.57%                   | -0.25%   | 1.02                | Digital Only: No Minimum; Personalized Planning & Advice: \$25,000              | Digital Only: for balances less than \$10,000 there is no fee, for balances between \$10,000 - \$49,999.99 it is \$3/mo, for balances \$50,000 and above it is 0.35% annually. Personalized Planning & Advice: 0.50% annually | 0.00%                          |
| FutureAdvisor <sup>3</sup>                    | 13.41%                   | -0.63%   | 0.98                | \$5,000   | 0.50% annually  | 0.07%                          |
| Merrill Edge Guided Investing <sup>31</sup>   | 13.72%                   | -0.88%   | 0.93                | Guided Investing: \$1,000; Guided Investing with an Advisor: \$20,000           | Guided Investing: 0.45% annually (digital only); Guided Investing with an Advisor: 0.85% annually   | 0.07%                          |
| Morgan Stanley Access Investing <sup>12</sup> | 13.82%                   | -1.63%   | 0.95                | \$5,000   | 0.30% annually  | 0.07%                          |
| Personal Capital <sup>4</sup>                 | 15.04%                   | -1.90%   | 0.93                | \$100,000   | 0.89% annually; discounted tiered pricing at higher asset levels  | 0.10%                          |
| Schwab <sup>5</sup>                           | 12.49%                   | -1.91%   | 0.79                | Intelligent Portfolios: \$5,000; Intelligent Portfolios Premium: \$25,000       | Intelligent Portfolios: No fee (digital only); Intelligent Portfolios Premium: \$300 initial planning fee, \$30/month subscription  | 0.17%                          |
| SigFig <sup>6</sup>                           | 14.97%                   | -0.12%   | 1.04                | \$2,000   | No fee for the first \$10k; 0.25% annually for balance over \$10k   | 0.06%                          |
| SoFi <sup>17</sup>                            | 15.26%                   | 0.36%  | 1.09                | \$5   | No management fee   | 0.04%                          |
| UBS Advice Advantage <sup>7</sup>             | 14.43%                   | -2.05%   | 0.87                | \$10,000  | 0.75% annually  | 0.14%                          |
| Vanguard P.A.S. <sup>43</sup>                 | 14.47%                   | -0.35%   | 0.99                | Vanguard Personal Advisor Services: \$50,000; Vanguard Digital Advisor: \$3,000 | Vanguard Personal Advisor Services 0.30% annually. Vanguard Digital Advisor combined underlying fund fees and management fees capped at 0.20%   | 0.07%                          |
| Wealthfront <sup>44</sup>                     | 15.02%                   | -0.62%   | 0.92                | \$500, some additional portfolio features require a higher minimum              | 0.25% annually  | 0.09%                          |
| Wells Fargo Intuitive Investor <sup>14</sup>  | 15.16%                   | 0.01%  | 0.94                | \$5,000   | 0.35% annually; discounted relationship pricing may be available  | 0.14%                          |
| Zacks Advantage <sup>29</sup>                 | 14.68%                   | -0.04%   | 0.99                | \$25,000  | 0.70% annually; discounted tiered pricing at higher asset levels  | 0.09%                          |

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Returns are net of fees and from 12/31/2018 - 12/31/2021. The weighted average expense ratio calculations exclude cash holdings from the portfolio

## Top Performers

### 1-Year Trailing Top Performers

|                        | Best                  | 2nd                   | 3rd                    |
|------------------------|-----------------------|-----------------------|------------------------|
| <b>Total Portfolio</b> | Schwab Domestic Focus | Zacks Advantage       | Marcus Invest Core IRA |
| <b>Equity</b>          | Zacks Advantage       | Schwab Domestic Focus | Marcus Invest Core IRA |
| <b>Fixed Income</b>    | Schwab Domestic Focus | Schwab                | Fidelity Go            |

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### 3-Year Trailing Top Performers

|                        | Best                       | 2nd                | 3rd             |
|------------------------|----------------------------|--------------------|-----------------|
| <b>Total Portfolio</b> | US Bank Automated Investor | Morgan Stanley SRI | SoFi            |
| <b>Equity</b>          | Morgan Stanley SRI         | SoFi               | Zacks Advantage |
| <b>Fixed Income</b>    | Schwab                     | Axos Invest        | SigFig          |

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### 5-Year Trailing Top Performers

|                        | Best        | 2nd                         | 3rd         |
|------------------------|-------------|-----------------------------|-------------|
| <b>Total Portfolio</b> | Fidelity Go | Tie: SigFig and Axos Invest |             |
| <b>Equity</b>          | Fidelity Go | Vanguard P.A.S.             | Axos Invest |
| <b>Fixed Income</b>    | Schwab      | SigFig                      | Axos Invest |

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Total Portfolio winners are based on the portfolio's return vs. the Normalized Benchmark. Returns are net of fees and are as of 12/31/2021.



## Performance Commentary

- *Domestic bias defined winning portfolios in 2021; Schwab, Zacks, and Marcus benefit*
- *Over three years, U.S. Bank and Morgan Stanley's SRI portfolios shine; SRI investments enjoyed a growth bias which propelled performance*
- *Long-term winners Fidelity Go and SigFig maintain their position atop the pile*
- *Riskier bonds support long-term fixed-income results from Schwab and SigFig - pointing investors away from low-risk bond ETFs*

### Background

2021 was the third consecutive positive year for U.S. markets, with the S&P 500 Index gaining over 28% as mega-cap blue-chip names like Apple and Microsoft were responsible for an outsized share of the market's gains. As a result, large-cap domestic equities outperformed their mid- and small-cap peers significantly. Despite value stocks having notable relative performance during the first portion of 2021, growth stocks ended the year higher, albeit just 3% higher when looking at the Russell 1000 Growth Index compared to the Russell 1000 Value Index. These market movements have led to a regime of new top robo advisors for short-term performance, including Schwab, a juggernaut in the space.

International equities fared notably worse than domestic market stocks in the fourth quarter; the MSCI EAFE Index finished in the green in large part due to a late-quarter rally. A relatively cautious approach to COVID and a persistent valuation discount were all factors that weighed on European equities relative to the U.S. Furthermore, many international developed markets contended with the global supply chain limitations and subsequent inflation fears. Emerging markets finished the quarter slightly

negative, further disappointing investors who diversified their U.S. holdings by allocating significantly to equities overseas.

From a fixed income perspective, high-quality bond holdings suffered losses as the 10-year U.S. Treasury rates rose from approximately 0.9% to 1.5%, causing the Barclays Bloomberg Aggregate Bond Index to decline by 1.5% for 2021. Short-duration bonds held up better, as did municipal issues and high-yield bonds. Robo advisors with diversified bond holdings supported returns while those tied to solely core, investment-grade bonds suffered losses.

### *2021: Schwab, Zacks, and Marcus Benefit from Domestic Bias, While Munis and TIPs Propel Bond Performance*

The top three performing robo advisors of 2021 are Schwab's Domestic Focus portfolio, Zack's Advantage, and Marcus Invest Core IRA. These robo advisors demonstrated compelling performance against their Normalized Benchmarks, propelled by stellar equity returns. When looking at the attribution of why these robos have performed so well, the resounding factor has been the domestic bias of these robo

advisors' stock portfolios. Zacks, the top equity performer, boasted over 87% domestic stocks, while Schwab Domestic Focus and Marcus Core IRA held 73% and 76% U.S. stocks, respectively. In contrast, our Robo Ranking study group of 20 top robo advisors had an average of about 65% U.S. stocks. This domestic bias proved especially

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*The resounding factor has been the domestic bias of these robo advisors' stock portfolios.*

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beneficial as the S&P 500 outperformed the MSCI EAFE Index and MSCI Emerging Markets Index by roughly 17% and 31%, respectively. Although

there was much talk of the return of value stocks this year, the Russell 1000 Growth Index and Russell 1000 Value Index returned roughly 28% and 25%, respectively, making style less of a defining contributor as it has been over longer periods.

The 1-year period ending December 31st, 2021 proved to be a different regime for bonds than years past. Specifically, investment municipal issues outperformed core taxable bonds by upwards of roughly 2.8% as the iShares Core U.S. Aggregate Bond Index returned -1.77% while the iShares National Municipal Index was up over 1%. The top three robo advisors for bond

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*Schwab benefitted from further diversifying its portfolios with TIPs exposure, which in light of significant inflation headlines, proved to be especially relevant.*

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performance were Schwab's Domestic Focus, Schwab's standard option, and Fidelity Go. These portfolios held 62%, 55%, and 100% municipal exposure, which was especially significant given the

average of our Robo Ranking Study Group was just 40%. Schwab benefitted from further diversifying its portfolios with TIPs exposure, which in light of significant inflation headlines, proved to be especially relevant. For example, Schwab's standard option holds significant portions of SCHP and SPIP, two TIPs ETFs that

returned over 5.5% each as the core CPI showed year-over-year inflation growth of between 5% and 7% throughout the second half of the year. As investors select a robo advisor to manage taxable accounts, a diversified bond portfolio that includes sectors like municipals and TIPs will be preferable to those that opt for solely traditional core bonds if this regime of higher rates and higher inflation continues.

### *Morgan Stanley SRI and U.S. Bank Top the Charts over Three Years*

The last three years were characterized by growth outperforming value, U.S. stocks outperforming international names, and large outperforming small. One theme not mentioned in that list is how Socially Responsible Investing (SRI), also known as Environmental, Social, and Governance (ESG) investing,

bolstered returns over the trailing 3-year period ending December 31st, 2021. Specifically, Morgan Stanley's Socially Responsible Investing, the robo

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*It is not just that SRI equities tend to be growth, as the portfolio held 4% more growth stocks than the Robo Ranking study group, but it also was underweight value by over 10%.*

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account with some of the best ESG scores and highest underlying funds fees, outperformed the average robo advisor significantly. For example, whereas Morgan's SRI equities returned 23.20% annually for the period, the median robo returned about 20.41% annually when looking at those accounts opened over three years. Interestingly, it is not just that SRI equities tend to be growth, as the portfolio held 4% more growth stocks than the Robo Ranking study group, but it also was underweight value by over 10%. Investors need to be aware that ESG investing is not just a growth play, but a decision to underweight value. For example, the energy sector is frequently underweight or non-existent in ESG-themed funds due to the environmental impact of oil and

gas production. Although the SRI, or ESG, style of investing has worked well over 3-years, in an inflationary environment that favors value investing, one would expect SRI investing to miss out on important allocations to value exposure.

U.S. Bank's Automated Investor portfolio stands out for its balance between themes; first and foremost, the robo has a comfortable 3% overweight to U.S. stocks compared to the Robo Ranking study group. Furthermore, the portfolio has a 7% underweight to value, further boosting returns, as well as an 3% overweight to large-cap names over mid- and small-cap issues, when compared to the study group. On the bond side, the account was a strong performer thanks to positions in HYG, a high-yield bond ETF that outperformed the standard AGG ETF by over 5%. By standing at the intersection of these positive return drivers, U.S. Bank's Automated Investor proved to be a well-rounded choice over three years.

### *Over Five Years: Fidelity Go, SigFig, and Axos Reward Investors with Strong Equity Returns*

When looking at the 5-year period ending December 31st, 2021, Fidelity Go, SigFig, and Axos were the top performers for the half-decade. Common themes amongst these advisors include a bias towards large-cap stocks over mid- and small-cap names, an overweight to growth stocks, and, not surprisingly, a healthy U.S. bias. When compared to our Robo Ranking study group, these top three advisors had upwards of 6% to 9% more large-cap exposure, with 77% large-cap for Fidelity and just 68% for the study group. Furthermore, the average market capitalization for the stocks in Fidelity Go's winning platform was over \$100B compared to a study group average of about \$62B. From a style perspective, the Russell 1000 Growth Index returned about 25% annually over 5 years, while the Russell 1000

Value Index returned roughly 11% during the same period; this supported the long-term performance of the winning advisors. One interesting note is that when expressing this growth bias, it is not so much that these advisors had specific growth-oriented funds, but rather that by holding the standard market-cap weighted indices, they enjoyed the excess return from indices like the S&P 500 becoming overweight growth stocks as these companies

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*Common themes amongst these advisors include a bias towards large-cap stocks over mid- and small-cap names, an overweight to growth stocks, and, not surprisingly, a healthy U.S. bias.*

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performed well and rose in price. The corrective measures by firms like Betterment and Wealthfront, which have dedicated value-oriented ETFs in their portfolio, were not as fortunate.

### *Trends in Long-term Bond Performance: Be Wary of Low-Risk Investments*

In terms of bond performance, as has been explained in detail in our previous edition of the *Report*, both an extended duration and additional credit exposure have been the key drivers of return. Both of these attributes increase the overall risk of the bond ETFs themselves when looking at measures of volatility, for example, but investors typically do get paid to hold risk over longer periods. For example, as detailed in our previous report, we commend the popular robo advisor Acorns for moving out of the SHY ETF, a short maturity treasury fund, for ISTB, a more diversified fund with longer maturities and an increase in credit exposure. Similarly, the winning advisors held some mix of extended duration or high-yield bonds. Schwab and SigFig, the top two fixed-income performers, held a duration of about 6.9 years and 6.3 years, respectively, while the Robo Ranking study group held about 5.7 years

of duration. Axos Invest opted for exposure to low-duration high-yield bonds via the HYS ETF, which returned north of 4.6%, annually, while the Bloomberg Barclays Aggregate Index returned

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*As investors shop for robo advisors to hold for the long term, investors should be wary of selecting a robo advisor with too conservative of bond positioning.*

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just 3.61%, for the same period. As investors shop for robo advisors to hold for the long term, investors should be wary of selecting a robo advisor with too conservative of bond positioning. The

forementioned SHY ETF returned only about 1.5% per annum for the same period.

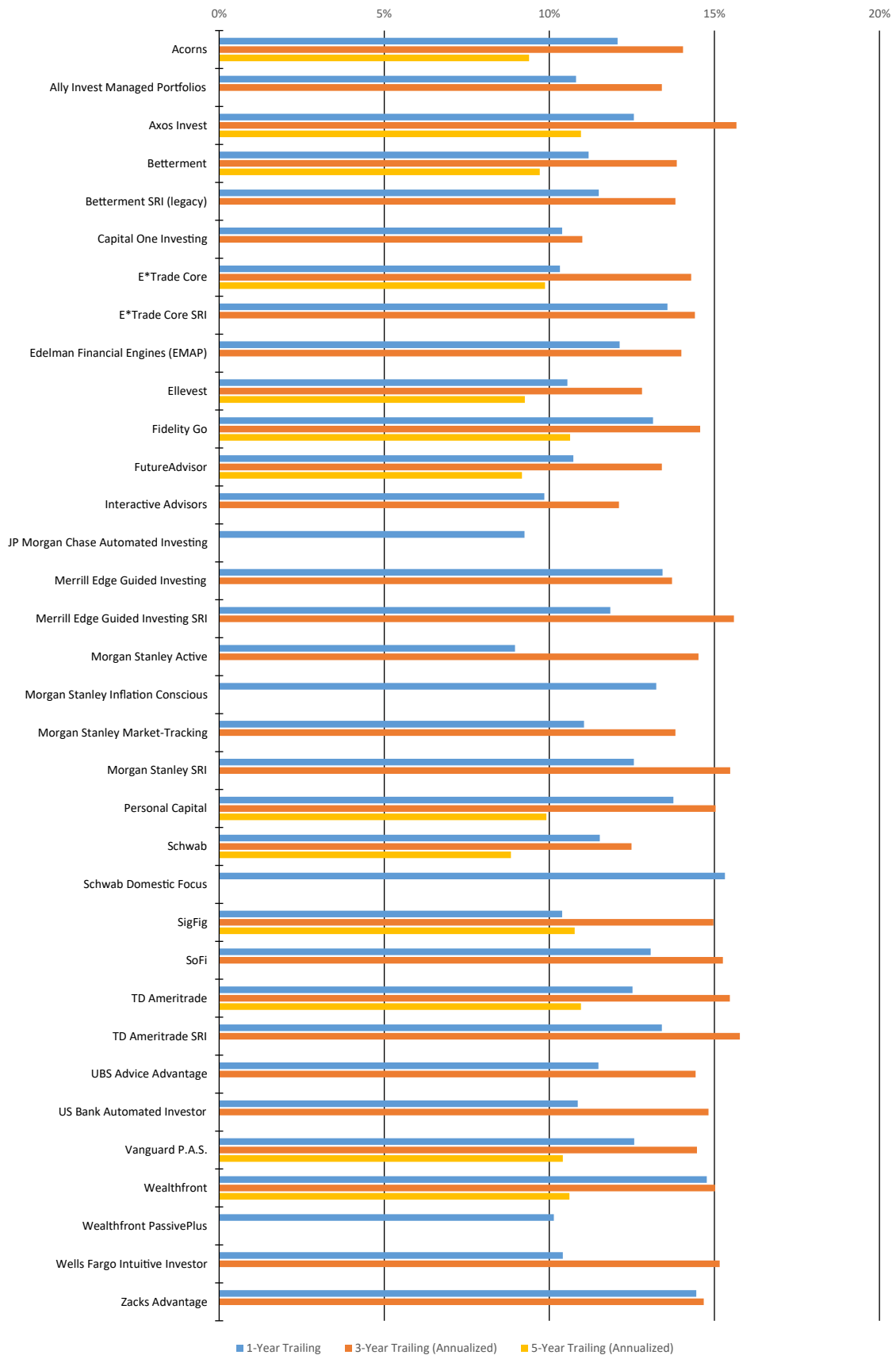
### *Final Thoughts Moving into 2022*

As we write this edition of the *Robo Report* in the wake of a volatile start to 2022, we are reminded every day that investors are concerned about volatility, inflation, and rising interest rates - at the same time. Value has done better this year, in light of higher inflation, as have short-duration bonds - in light of the Fed signaling multiple rate hikes. Both of these moves will likely favor new robos at the top of the leaderboards in 2022. Specifically, we expect that Schwab, Wealthfront,

and Personal Capital will start to show compelling relative performance as their tendencies towards more value-oriented portfolios and, in some cases, exposure to commodities and energy stocks boost relative performance compared to the current regime of Fidelity, SoFi, SigFig, and Axos as top long-term performers. A savvy investor has a few choices. If they believe we are fundamentally in a low-inflation and low-growth environment, they may want to continue to invest in growth-oriented robos like current long-term winners named above. However, another option may be to switch to an advisor like Wealthfront, which offers specific energy and value-stock exposure. Perhaps most prudently, an investor can consider pairing robo advisors with different investment philosophies to maximize the available features and bring some diversification to their portfolios. For example, Wealthfront and Fidelity Go, or Betterment and SoFi, can offer a mix of value and growth, respectively.



## Total Portfolio Performance



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Last updated: 9/30/2021

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<sup>1</sup> These accounts were funded with more than the minimum amount required to establish an account. Had the accounts been funded with more assets, they would be charged a flat dollar fee up to \$1,000,000. Because the fee is a flat dollar amount, a higher account balance would have the result of increasing reflected performance, while a lower account balance would have the result of decreasing reflected performance. In December of 2018, a \$1 fee was not recorded. Performance has been updated to include this fee as of Q1 2019.

<sup>2</sup> This account has no minimum required to establish an account, but had the account been funded with more assets, it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance.

<sup>3</sup> These accounts were funded with more than the minimum amount required to establish an account. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account's asset level.

<sup>4</sup> This account was funded with the minimum or more than the minimum amount required to establish an account at the time of opening. Had the account been funded with more assets it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance.

<sup>5</sup> This account was funded with more than the minimum in order to take advantage of tax-loss harvesting. Tax-loss harvesting may result in better or worse performance compared to similarly positioned accounts that are not enrolled in tax-loss harvesting. This account is enrolled in their digital-only "Intelligent Portfolios", thus it is not charged an advisory fee. If one were to upgrade to "Intelligent Advisory" which introduces access to live advisors, a subscription fee would be levied, which would decrease reflected performance.

<sup>6</sup> These accounts were funded with the minimum amount required to establish an account. At balances less than \$10,000, there is no advisory fee. Had the account been funded with \$10,000 or more, an asset-based advisory fee would be levied, which would decrease reflected performance.

<sup>7</sup> These accounts were funded with the minimum amount required to establish an account at the time of opening. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account's asset level.

<sup>8</sup> These accounts have no minimum required to establish an account. Prior to the Axos and Wisebanyan acquisition and integration, this account was not charged a management fee. Had additional service packages, such as tax-loss harvesting, been added, the lesser of an asset-based fee or flat dollar fee would have been assessed. These fees would have decreased the reflected performance. Currently, this account is charged a 0.24% management fee. In August of 2021, there was a reporting issue with this provider. The issue has been resolved but the resolution effectively caused a rebalance of the account on 09/30/2021.

<sup>9</sup> This account was funded with the minimum investment amount at the time. At the time of opening, the account had a 0.25% management fee. Due to changes in the service at the end of the 1st quarter of 2017, new accounts are charged a 0.30% management fee. The fee on our account was grandfathered in and remains at 0.25%. The higher advisory fee would have the result of decreasing reflected performance.

<sup>10</sup> These accounts were funded with the minimum amount required to establish an account. This account is enrolled in their digital-only "Essential Portfolios" and is charged an asset-based advisory fee. If one were to upgrade to "Selective Portfolios" which introduces access to live advisors, a higher asset-based advisory fee schedule would apply, which would decrease reflected performance. "Essential Portfolios" does not appear to be available to new clients, likely due to the pending Schwab and TD Ameritrade integration. These accounts are grandfathered into the "Essential Portfolios" program and are charged a 0.30% annual asset-based management fee.

<sup>11</sup> This account has no minimum required to establish an account, but had the account been funded with more assets, it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. A special request was made for an allocation of 60% equities and 40% fixed income or close to it, but this allocation was not one of the standard models at the time of account opening. At the time of account opening the closest standard models offered were in the range of 50/50 or 75/25 equity to fixed income split.

<sup>12</sup> These accounts were funded with more than the minimum amount required to establish an account. Due to the asset-based advisory fee, performance is not affected by the accounts' asset levels. In previous reports, we reported the performance of two accounts that were combined to achieve a 60/40 allocation. Due to our introduction of Normalized Benchmarking we are no longer reporting the combined account, but just the account with the closest to a 60/40 allocation as we could achieve at this provider.

<sup>13</sup> These accounts were funded with less than the minimum investment through an agreement between BackEnd Benchmarking and the provider. There is no advisory fee levied regardless of the amount of assets invested.

<sup>14</sup> This account was funded with the minimum amount required to establish an account. A flat, asset-based advisory fee is levied on the account. Had we subscribed to additional, specific, provider products the account would be eligible for a lower asset-based advisory fee. A lower advisory fee would have the result of increasing reflected performance.

<sup>15</sup> This account has no minimum required to establish an account and is enrolled in the Digital Only plan. If the account was enrolled in the premium service with access to live advisors, there would be a higher asset-based advisory fee. The higher advisory fee would have the result of decreasing reflected performance.

<sup>16</sup> This account is enrolled in the Self Service plan. If the account was enrolled in the Full Service Plan, the fee would be higher or lower depending on the level of assets in the account. The higher/lower advisory fee would have the result of decreasing/increasing reflected performance. Recently, this provider changed its fee schedule, but our account was grandfathered in at the previous, lower fee for the size of the account. New accounts would be subject to the new fee schedule, which would decrease reflected performance at most account size levels.

<sup>17</sup> This account was funded with more than the minimum amount required to establish an account. This account will not be charged an advisory fee through 2019. In previous reports, we reported the performance of two accounts that were combined to achieve a 60/40 allocation. Due to our introduction of Normalized Benchmarking we are no longer reporting the combined account, but only the account with the closest to a 60/40 allocation as we could achieve at this provider.

<sup>18</sup> This account was funded with more than the minimum amount required to establish an account. This account will not be charged an advisory fee through 2019.

<sup>20</sup> This account was funded with the minimum required to establish an account. This account is enrolled in their digital-only “Intelligent Portfolios”, thus it is not charged an advisory fee. If one were to upgrade to “Intelligent Advisory” which introduces access to live advisors, a subscription fee would be levied, which would decrease reflected performance.

<sup>21</sup> These accounts were funded with more than the minimum amount required to establish an account. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account’s asset level. The fee was waived for the first year. Had a fee been levied, reflected performance would have been lower.

<sup>22</sup> These accounts were funded with more than the minimum amount required to establish an account. There is currently no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account’s asset level. Previously, the fee was only assessed on balances in excess of \$10,000.

<sup>23</sup> These accounts were funded with the minimum amount required to establish an account. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account’s asset level. The fee was waived for an initial promotional period. Had a fee been levied, reflected performance would have been lower.

<sup>24</sup> Interactive Advisors is registered as an advisor under the name of Covestor Ltd. and is part of the Interactive Brokers Group. This account was funded with the minimum required to open an account and is invested in their Asset Allocation portfolio. It is charged an asset-based fee. There is no fee schedule on this account; therefore performance is not affected by the account’s asset levels. Previously, the account was charged a lower asset-based fee; the increase took effect starting March 2019. Interactive Advisors offers multiple strategies with different sets of fees, including Smart Beta, index-tracking and model ETF portfolios, in addition to the Asset Allocation portfolios. Interactive Advisors also offers a marketplace for actively managed portfolios for which it charges higher fees (0.08-1.5%), part of which it remits to the portfolio managers supplying the data underlying those strategies.

<sup>25</sup> Originally, there was no advisory fee on these accounts. Had additional service packages, such as tax-loss harvesting, been added, the lesser of an asset-based fee or flat dollar fee would have been assessed. In June 2018, one package was activated, resulting in a fee on these accounts. This fee decreases the reflected performance.

<sup>26</sup> This account was enrolled in Prudential’s Strategic Portfolios. It was funded with the minimum required to open an account. Had the account been funded with more assets it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. Prudential also offers Reserve Portfolios for short-term investing, which have a lower account minimum and fee. However, the Reserve Portfolios do not allow asset-allocation customization based on individual demographic and risk tolerance.

<sup>27</sup> This account has no minimum required to establish an account and is enrolled in the Digital Only plan. If more was invested, the account would be assessed a lower asset-based fee, which would increase reflected performance. If the account was enrolled in the premium service with access to live advisors, there would be a higher asset-based advisory fee. The higher advisory fee would have the result of decreasing reflected performance. All balances above \$2 million are charged a lower asset-based advisory fee. A lower advisory fee would have the result of increasing reflected performance. The 2018 end-of-year statement for Betterment did not include dividends received near the end of 2018, these dividends first appeared on the March 31st, 2019 statement.

These dividends are reflected as of the Q1 2019 Robo Report but were not reflected in performance reported in the Q4 2018 Robo Report. In Q2 2020 a dividend was misattributed to the cash asset class instead of income causing the equity performance of the main Betterment account to be slightly underrepresented.

<sup>28</sup> These accounts were funded with the minimum amount required to establish an account. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account's asset level. The fee was waived for an initial promotional period. Had a fee been levied, reflected performance would have been lower. As of March 27, 2019, the management fee has been lowered. The lower advisory fee will increase reflected performance.

<sup>29</sup> This account was funded with the minimum or more than the minimum amount required to establish an account at the time of opening. Had the account been funded with more assets it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. After opening, this provider changed its fee schedule, raising the fee for the asset level of the account, but our account was grandfathered in at the previous, lower fee. New accounts would be subject to the new fee schedule, which may change reflected performance.

<sup>30</sup> These accounts were funded with more than the minimum amount required to establish an account. The account is charged a flat dollar fee subscription at its service level. Had the accounts been enrolled in different service packages, they could be assessed a higher subscription fee. Because the fee is a flat dollar amount, a higher account balance would have the result of increasing reflected performance, while a lower account balance would have the result of decreasing reflected performance.

<sup>31</sup> These accounts were funded with the minimum amount required to establish an account at the time of opening. This account is enrolled in their digital-only "Guided Investing" and is charged an asset-based advisory fee. If one were to upgrade to "Guided Investing with an Advisor" which introduces access to live advisors, a higher asset-based advisory fee schedule would apply, which would decrease reflected performance.

<sup>32</sup> This account has no minimum required to establish an account and is enrolled in the Digital Only plan. If the account was enrolled in the premium service with access to live advisors, there would be a higher asset-based advisory fee. The higher advisory fee would have the result of decreasing reflected performance. All balances above \$2 million are charged a lower asset-based advisory fee. A lower advisory fee would have the result of increasing reflected performance.

<sup>33</sup> This account has no minimum required to establish an account and is enrolled in the Digital Only plan. If the account was enrolled in the premium service with access to live advisors, there would be a higher asset-based advisory fee. The higher advisory fee would have the result of decreasing reflected performance. Prior to August 2020, this account was assessed a 0.35% annual management fee. As of August 2020, the provider changed the fee structure such that accounts under \$10,000 are not charged a management fee. Our account is under this threshold and will therefore not be charged a management fee starting in August of 2020. This will have the result of increasing reflected performance.

<sup>34</sup> This account was funded with more than the minimum required to establish an account, There is no management fee levied. Therefore, performance is not affected by the account's asset level. This platform has numerous different portfolio strategies. We chose the "moderately aggressive" strategy. Different portfolio strategies have different allocations which could increase or decrease reflected performance.

<sup>35</sup> These accounts were funded with the minimum amount required to establish an account. This account is enrolled in their "Selective Portfolios" and is charged an asset-based advisory fee. These specific portfolios are only offered at the "Selective Portfolios" level, which charges a higher asset-based advisory fee due to access to live advisors than the "Essential Portfolios." Additionally, these portfolios may hold balanced funds. Due to the nature of these funds and limits in our portfolio management system, we cannot accurately track equity and fixed income performance individually at the portfolio level for portfolios with balanced fund holdings. Total portfolio performance is unaffected by holding balanced funds.

<sup>36</sup> These accounts were funded with more than the minimum amount required to establish an account. There is no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account's asset level. This platform has numerous different portfolio strategies. We chose the "60/40 classic" option. Different portfolio strategies have different allocations which could increase or decrease reflected performance.

<sup>37</sup> These accounts were funded with the minimum amount required to establish an account. This account is enrolled in their "Selective Portfolios" and is charged an asset-based advisory fee. These specific portfolios are only offered at the "Selective Portfolios" level, which charges a higher asset-based advisory fee due to access to live advisors than the "Essential Portfolios."

<sup>38</sup> These accounts were opened when the provider charged 0.25% annual management fee. Recently, the fee structure changed to be a flat monthly fee. However, our account was grandfathered into the old fee structure. This change may have the result of increasing/decreasing reflected performance based on account size.

<sup>39</sup> This account charges a 0.15% annual management fee and caps the underlying fund fees at 0.05% so that the all-in fee never exceeds 0.20% annually. The same fee is charged at all asset levels.

<sup>40</sup> This account charges 0.55% annually. However, those with a Citi Gold or Priority account (required balances of \$50,000 and \$200,000 respectively) will not be charged a management fee, which would increase reflected performance.

<sup>41</sup> This account is enrolled in the "Standard" pricing plan for \$120 a year which is paid by an outside bank account. This account was opened with a \$5,000 initial deposit. We assess the fee on the account as though it was opened with a \$50,000 initial deposit. We assess a \$1 monthly, \$12 a year,

management fee on this account. A flat dollar fee pricing structure means the level of assets in the account will affect net-of-fee performance.

<sup>42</sup> These accounts were funded with more than the minimum amount required to establish an account. The account is charged a flat dollar fee subscription. Because the fee is a flat dollar amount, a higher account balance would have the result of increasing reflected performance, while a lower account balance would have the result of decreasing reflected performance.

<sup>43</sup> This account was funded with the minimum or more than the minimum amount required to establish an account at the time of opening. Had the account been funded with more assets it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. On June 19th, 2017, Vanguard removed Backend Benchmarking's primary Vanguard account from the Vanguard Personal Advisor Services program. As of June 20th, 2017, the primary account was replaced by a secondary account with the same risk profile as the primary account. The returns for the secondary account have been linked to the original primary account. Asset type and allocation between the two accounts at the time of the switch were very close but not identical.

<sup>44</sup> These accounts were funded with more than the minimum amount required to establish an account. There is currently no fee schedule; all accounts are charged the same asset-based fee. Therefore, performance is not affected by the account's asset level. Previously, the fee was only assessed on balances in excess of \$10,000. In the 1st Quarter of 2018 Wealthfront liquidated the positions in the account used for the 4th Quarter 2017 and previous editions of this report. A different account was used for this report and is labeled "Wealthfront (Risk 4.0)". The performance numbers from the previous account are available in the addendum labeled as "Wealthfront (Risk 3.0)". The risk scores and thus allocations of the two accounts are different and labeled as such. Asset type and allocation between the two accounts at the time of the switch were close but not identical. The difference in equity allocation between the accounts on 12/31/2017 was approximately 5.4%.

<sup>45</sup> These accounts were funded with the minimum amount required to establish an account. This account is enrolled in their digital-only "Essential Portfolios" and is charged an asset-based advisory fee. If one were to upgrade to "Selective Portfolios" which introduces access to live advisors, a higher asset-based advisory fee schedule would apply, which would decrease reflected performance. Due to the down market in December 2018, this account engaged in repeated tax-loss harvesting on one of its asset types. All alternative securities were exhausted for this asset type, so to prevent a wash sale, the entire position, representing approximately 31% of the portfolio, was liquidated and held as cash for a 1 month period, during which time the market experienced a large upswing. Because this portfolio missed the market upswing, its performance versus the normalized benchmark is lower.

In previous reports, the initial target asset allocation was calculated as the asset allocation at the end of the first month after the account was opened. In the Q3 2018 report, we adjusted our method to calculate the initial target asset allocation as of the end of the trading day after all initial trades were placed in the accounts. This adjustment has caused some portfolio's initial target allocation to be updated from previous reports. These updates did not change any initial target allocations of equity, fixed income, cash, or other by more than 1%.

Prior to Q3 2018, due to technological limitations of our portfolio management system, some accounts which contained fractional shares had misstated the quantity of shares when transactions quantities were smaller than 1/1000th of a share in a position as a result of purchases, sales, or dividend reinvestments. This had a marginal effect on the historical performance of the accounts. The rounding of position quantities caused by this limitation has been resolved, and quantities have been adjusted to reflect the full position to the 1/1,000,000th of a share as of the end of Q3 2018. Therefore, this rounding of fractional shares will not be necessary in the future.

At certain custodians, a combination of the custodian providing us a limited number of digits on fractional share and fractional cent transactions rounding errors are introduced into our tracking. At quarter-end starting 3/31/2020, we implemented a process to enter small transactions to eliminate any rounding errors that have built up to more than a full cent. These transactions are small and do not have an appreciable effect on performance.

Sharpe ratios and Standard Deviation calculations are calculated with the assumption of 252 trading days in a year.

This report represents Backend Benchmarking's research, analysis and opinion only; the period tested was short in duration and may not provide a meaningful analysis; and, there can be no assurance that the performance trend demonstrated by Robos vs indices during the short period will continue. Backend Benchmarking is owned by Condor Capital Wealth Management, an SEC-registered investment adviser. A copy of Condor's Disclosure Brochure is available at [www.condorcapital.com](http://www.condorcapital.com). Condor Capital holds a position in Schwab, JP Morgan Chase, and Goldman Sachs in one of the strategies used in many of their discretionary accounts. As of 12/31/2021, the total size of the position was 38,373 shares of Schwab common stock, 17,799 shares of JP Morgan Chase common stock, and 5,892 shares of Goldman Sachs common stock. As of 12/31/2021 accounts discretionarily managed by Condor Capital Management held bonds issued by the following companies: Morgan Stanley, Bank of America, Goldman Sachs, Wells Fargo, E\*Trade, Citi Group, JP Morgan Chase, Citizens Financial Group, Ally Financial, Charles Schwab, and Capital One.

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