BRINGING TRANSPARENCY TO ROBO INVESTING

EDITION 20

The Robo Report™ Second Quarter 2021

We are proud to publish the 20th edition of the *Robo Report*™, covering the second quarter of 2021, and the seventh edition of the *Robo Ranking*™. 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:

- *SoFi wins Best Overall Robo Advisor thanks to stellar performance, low cost, and access to live advice (pg. 6)*
- *Schwab's Domestic Focus and standard portfolio were top choices when value investing outperformed (pg. 11)*
- *Which robos are ready for inflation? Wealthfront and Morgan's Inflation Conscious portfolio step up to the plate (pg. 13)*
- *Robo AUM study: Robo advisors grow approximately 25% year-over-year (pg. 19)*
- *Special report: Schwab Intelligent Portfolios is estimated to cost investors over $500 million in missed growth as a result of high cash allocations (pg. 22)*

Table of Contents

All supporting data can be found online at backendbenchmarking.com/data

- ***AUM Tables***
- ***Total Portfolio Returns***
- ***Equity & Fixed Income Returns***
- ***Fees, Minimums, and Allocations***
- ***Risk Statistics***
- ***Normalized Benchmarks***
- ***International Allocation***
- ***Disclosures***

Executive Summary

This edition of the *Robo Report*™ tracks 77 accounts at 43 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.

New Best Overall Robo: SoFi takes the Top Spot

SoFi has narrowly edged out SigFig for the top spot for Best Overall Robo Advisor in this edition of the *Robo Ranking*. SoFi's first-place finish can be attributed to its top performance grade, access to financial experts, and exceptionally low total cost. In addition to SoFi, SigFig and E*Trade were top choices, finishing second and third, respectively. SigFig continues to stand out with stellar long-term performance, low cost, and unique portfolio tools like the Portfolio Tracker. E*Trade's balanced platform offers different themes, thorough tools, and a top-tier track record. Although investors will benefit most from selecting a robo advisor based on their own specific needs, these are some of the best picks overall.

CPI Rising: Schwab, Wealthfront, and Morgan's Inflation Conscious Portfolio Shine

The first half of 2021 has led to a series of new top robo advisors. Schwab's Domestic Focus and standard option both impressed in total portfolio performance and equity performance, thanks to value-tilted ETFs that weight stocks according to fundamentals. Wealthfront owned an energy ETF, VDE, that proved to be a timely hedge when inflation concerns were in the news. Finally, our Morgan Stanley Inflation Conscious portfolio invested in a pipeline ETF and a commodities ETF, which propelled performance during 2021.

3-Year Winners: T. Rowe Price, SigFig, and Morgan Stanley SRI

T Rowe's first-place finish was supported by significant outperformance in one of its actively managed mutual funds, OTCFX. Meanwhile, SigFig's allocation to total U.S. stock market ETFs continued to bolster performance as these funds have become tilted towards growth. Morgan Stanley SRI (Socially Responsible Investing) placed in the top three, which is notable as well. This portfolio's stock allocation boasts the best ESG (Environmental, Social, & Governance) score amongst those SRI options tracked at the *Robo Report* when looking at our longer-term study group.

Study: What did Schwab's High Cash Allocation Cost Investors?

We estimate that over the past six years, the high cash allocation in Schwab's Intelligent Portfolios has cost investors over $500 million dollars in portfolio growth, assuming Schwab had fully invested these portfolios in Schwab's bond portfolio and charged a 0.30% management fee. Furthermore, we estimate that Schwab missed out on significant revenues by using this revenue model instead of a traditional management fee.

The Robo Ranking™

Bringing Transparency to Robo Investing

We are excited to publish the 7th edition of the *Robo Ranking™*. 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.

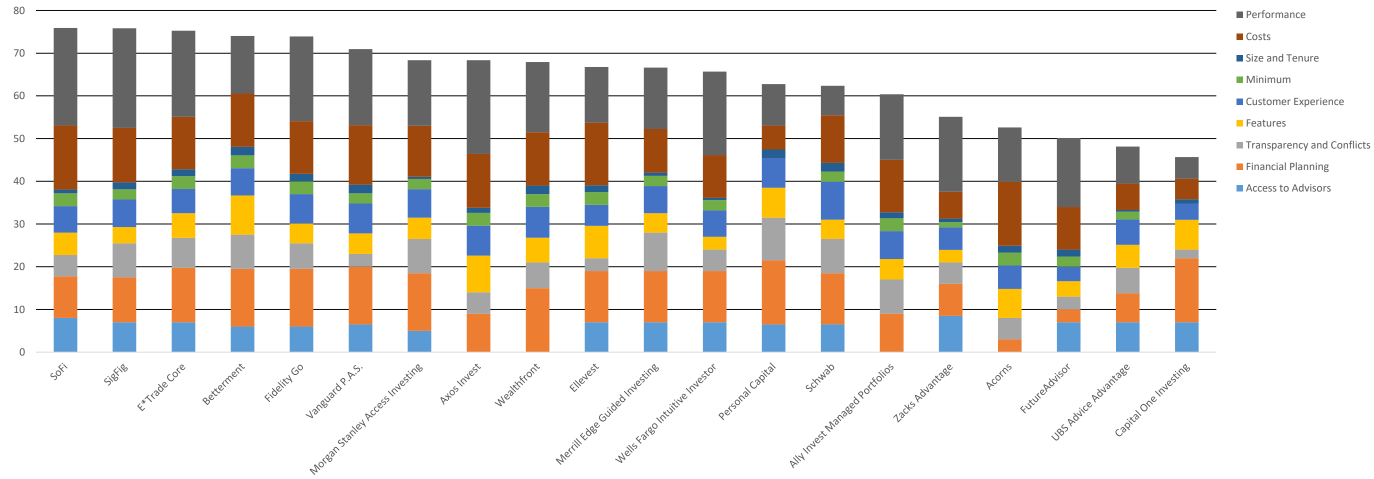
Introduction

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 be found at the end of the *Report*, as well as 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	22.82	75.89
SigFig	7.00	10.50	8.00	3.80	6.45	2.40	1.60	12.75	23.32	75.82
E*Trade Core	7.00	12.75	7.00	5.80	5.66	3.00	1.60	12.29	20.14	75.23
Betterment	6.00	13.50	8.00	9.17	6.40	3.00	2.00	12.50	13.45	74.02
Fidelity Go	6.00	13.50	6.00	4.60	6.91	3.00	1.72	12.36	19.84	73.92
Vanguard P.A.S.	6.50	13.50	3.00	4.80	7.00	2.40	2.00	13.96	17.79	70.94
Morgan Stanley Access Investing	5.00	13.50	8.00	5.00	6.66	2.40	0.50	11.96	15.34	68.36
Axos Invest	0.00	9.00	5.00	8.60	7.00	3.00	1.20	12.60	21.94	68.34
Wealthfront	0.00	15.00	6.00	5.80	7.20	3.00	2.00	12.50	16.41	67.91
Ellevest	7.00	12.00	3.00	7.56	4.91	3.00	1.60	14.65	13.05	66.77
Merrill Edge Guided Investing	7.00	12.00	9.00	4.54	6.35	2.40	0.75	10.22	14.37	66.63
Wells Fargo Intuitive Investor	7.00	12.00	5.00	3.00	6.20	2.40	0.50	10.06	19.51	65.67
Personal Capital	6.50	15.00	10.00	7.00	6.96	0.00	2.00	5.60	9.71	62.77
Schwab	6.50	12.00	8.00	4.52	8.88	2.40	2.00	11.17	6.88	62.35
Ally Invest Managed Portfolios	0.00	9.00	8.00	4.80	6.54	3.00	1.40	12.29	15.34	60.37
Zacks Advantage	8.50	7.50	5.00	2.95	5.30	1.20	0.83	6.26	17.58	55.11
Acorns	0.00	3.00	5.00	6.80	5.50	3.00	1.60	15.00	12.70	52.60
FutureAdvisor	7.00	3.00	3.00	3.60	3.40	2.40	1.60	9.97	16.14	50.11
UBS Advice Advantage	7.00	6.75	6.00	5.40	5.94	1.80	0.42	6.17	8.65	48.12
Capital One Investing	7.00	15.00	2.00	7.00	3.80	0.00	0.98	4.85	5.05	45.69
MAX	10	15	10	10	10	3	2	15	25	100

Produced by Backend Benchmarking for BackendB.com

Best Robo Advisors

Best Overall Robo Advisor

- **Winner: SoFi Invest**
- **Runner-up: SigFig**
- **Honorable Mention: E*Trade**

SoFi has narrowly edged out SigFig for the top spot for Best Overall Robo Advisor in this edition of the *Robo Ranking*. SoFi's first-place finish can be attributed to its substantial value proposition made accessible for nearly no cost. Also, SoFi boasted a tie for first place in Sharpe ratio, a major contributor to the performance portion of the *Ranking*, alongside SigFig, the second-place winner. E*Trade achieved a notable third-place spot supported by performance, especially in the bond portion of the portfolio. For a detailed look at the drivers of performance for SoFi and SigFig, please review the commentary for the Performance at a Low Cost award.

A customer can invest with SoFi with 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* had 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, they may start to charge customers for more of their services. That said, in its current form, the SoFi platform is an attractive option.

Currently, SoFi charges no management fee. For comparison, the average robo advisor in this edition of the Ranking had a management fee of 0.35%.

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 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 live advice for a $50,000 minimum.

SigFig won runner-up in this edition of the *Ranking*. With an accessible $2,000 minimum, access to live advisors, and the second-best performance score, this platform makes sense for many investors. It offers a portfolio monitoring feature that allows the user to track their accounts each week and a portfolio checkup to analyze outside accounts that are not managed by SigFig. SigFig also avoided many pitfalls that held back other robo advisors; while some lost points for poor performance, others did not earn points for access to advisors.

SigFig offers a portfolio monitoring feature that allows the user to track their outside accounts each week.

The new winner in this category is E*Trade. E*Trade's Core Portfolios is accessible, requiring only $500 to get started. Powered by MoneyGuidePro, E*Trade's toolkit for retirement and financial planning is of the quality and depth that can accurately facilitate the planning process. Unfortunately, these tools are not yet fully integrated with the investment accounts. This means that despite the depth of these tools, they are not the most user-friendly.

At its lowest tier, E*Trade offers access to an SRI-themed option. Socially Responsible Investing continues to grow in popularity and is top of mind for many modern investors. Although it comes with a higher management fee and a $25,000 minimum, E*Trade also offers Blend Portfolios, which brings with it a financial consultant to offer personalized advice to the investor. At the E*Trade Core service level investors have access to a call center, but these service representatives are there for mostly operational support. All in all, the E*Trade platform is well-rounded and can be used for planning or a more casual investment option.

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: SigFig**

SoFi won the Best Robo for Performance at a Low Cost award, narrowly defeating SigFig. Still, both robo advisors are an excellent choice for investors looking for a strong track record and limited fees. The performance score uses returns versus the Normalized Benchmark for the 3-year period ending June 30, 2021.

SoFi and SigFig earned a 0.81 Sharpe ratio for the 3-year period ending June 30, 2021. The average was 0.70 for the *Ranking* group of 20 robo advisors. When looking at the SoFi portfolio, the largest allocation was to SFY, a proprietary fund that invests in the 500 largest U.S. companies. Meanwhile, SoFi invested around 4% in mid-cap funds and 2% in small-cap funds, which boded well given that the S&P 500 returned close to 67%, cumulatively, for the 3-year period ending June 30, 2021, while the Russell Mid-Cap and Russell Small-Cap returned approximately 58% and 46%, respectively.

SoFi and SigFig earned a 0.81 Sharpe ratio for the 3-year period. The average was 0.70.

Trailing just behind, SigFig benefitted from many of the same themes. Its U.S. large-cap exposure has been favored tremendously in the last three years. SigFig also holds a substantial amount of emerging market stocks; this allocation bolstered performance, as the MSCI Emerging Markets index returned close to 39% and the MSCI EAFE index returned roughly 29%, cumulatively, for the trailing 3-year period ending June 30, 2021.

Lastly, both SoFi and SigFig avoided a few major pitfalls. Namely, they did not tilt their portfolios towards value, nor did either portfolio hold excess cash. SoFi and SigFig held 0.01% cash and 0.70%, respectively, at a time when our Schwab account held 9.99% cash, according to the portfolio's holdings as of June 30, 2021.

From a fee perspective, SoFi offers its robo advisor with no management fee and our account had just 0.04% fund fees. Similarly, SigFig offers the first $10,000 managed for free, and 0.25% fee after that, with average fund fees of 0.06%. These are strong options when compared to the field. The average robo advisor in the *Ranking* charges a 0.35% management fee and has a 0.08% average fund fee. It is worth remembering that traditional advice relationships can charge upwards of 1% to 1.5% with mutual fund fees north of 1%. The ETF revolution and the advent of the robo advisor offer tremendous value to those who otherwise would have been left out or paid significantly high fees. SoFi and SigFig are exceptional examples of this trend.

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. Also, Betterment offers a smart beta portfolio as well as an income-focused portfolio. However, perhaps most notably, Betterment offers three new ESG-themed

For a low fee of 0.25% annually, Betterment offers excellent digital planning tools and access to CFP-designated advisors.

options, including Climate Impact, Social Impact, and Broad Impact.

When looking at Betterment's interface, an intuitive dashboard allows the investor to have different goals and different investment portfolios to meet each goal. Each goal allows the user to model different inputs, whether deposits, time horizon, or various inputs for the retirement plan. A first-time investor can start with an excellent suite of educational tools and, as they grow, access more sophisticated advice from CFP advisors.

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.

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.

Best Robo for Digital Financial Planning

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

Perhaps one of the most significant impacts of the advent of the robo advisor is the proliferation of the digital financial plan. When looking at the top three robo advisors in this important category, there are a few major trends. First, the ability to link outside accounts so the user can see their full financial picture. Next, a unified goal that brings together the elements of the plan in one projection. Finally, we look for a level of detail in the features offered so that they accurately reflect the complexity of an individual's financial life. Together, these characteristics make Wealthfront, Personal Capital, and Schwab Intelligent Portfolios Premium stand out for the Best Robo for Digital Financial Planning.

Wealthfront's Self-Driving Money is a set of features that helps investors manage funds from the time that they deposit their paycheck to the point where they invest long-term. Autopilot, one component of this feature, is designed to alert the investor when they are holding excess cash above a pre-designated threshold. From there, the user can move funds into a long-term investment account, maximizing their time in the market. Another example of Wealthfront's sophistication is the detail in which a user can model a home purchase. Unlike many other platforms, Wealthfront includes a user's zip code and house specifications. The combination of design and innovation make planning with Wealthfront smooth.

Autopilot is designed to alert the investor when they are holding excess cash. From there, the user can move funds into long-term investments.

The runner-up is Personal Capital. This digital platform stands out for offering a detailed suite of tools that analyze many 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 it 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 alongside budgeting and cash flow features that allows a user to easily monitor their situation.

The planning tools at Schwab Premium are powered by MoneyGuidePro, an institutional-quality suite.

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.

Best Robo for Complex Financial Planning

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

For investors who have complex planning needs, digital offerings that include a live human advisor are essential. Vanguard Personal Advisor Services is the quintessential choice for this category, while Personal Capital and Ellevest have compelling offerings as well.

Vanguard Personal Advisor Services is the juggernaut in this space. It is one of the largest platforms with over $243 billion in assets as of June 30, 2021. For a low management fee of 0.30% and a minimum investment of $50,000, users can work with a live advisor to model multiple financial goals. Investors can view a comprehensive illustration of their assets for a full picture. When we consider that traditional financial advice relationships often require at least $250,000 in assets and at least a 1% management fee, Vanguard Personal Advisor Services has paved the way for a new kind of service.

Vanguard P.A.S. is the juggernaut in the hybrid space. It is one of the largest platforms with over $243 billion in assets.

The runner-up, Personal Capital, combines best-in-class online tools with a team of live advisors at a minimum of $100,000. Its fee of 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 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 many of these services for one-time fees at reduced rates based on their level of membership. Through Private Wealth or one-time purchases, investors across the Ellevest platform can access sophisticated advice to handle complex inquiries and situations.

Ellevest Private Wealth offers a combination of planning, impact investing, and executive coaching tailored for women.

Robo Ranking Facts (Results as of 06/30/2021)

	3-Year Annualized Return	3-Year Return Above/Below Normalized Benchmark	3-Year Sharpe Ratio	Account Minimum	Advisory Fee	Weighted Average Expense Ratio
Acorns[1]	10.43%	-1.12%	0.68	No minimum	$1/month for Lite; $3/month for Personal; $5/month for Family	0.05%
Ally Invest Managed Portfolios[9]	10.35%	-1.02%	0.72	$100	0.30% annually; Also offers 'cash-enhanced' portfolio with 30% invested in cash and no management fee	0.06%
Axos Invest[8]	12.10%	0.22%	0.77	$500	0.24% annually	0.09%
Betterment[27]	11.04%	-0.93%	0.68	Digital: No minimum; Premium: $100,000	Digital: 0.25%; Premium: 0.40%	0.09%
Capital One Investing[16]	7.44%	-3.98%	0.52	$100,000	0.99% annually; discounted tiered pricing at higher asset levels	0.07%
E*Trade Core[21]	11.33%	-0.15%	0.75	$500	0.30% annually	0.05%
Ellevest[38]	10.04%	-1.03%	0.68	No minimum; Private Client: $1 million	$1/month for Essential; $5/month for Plus; $9/month for Executive	0.07%
Fidelity Go[33]	11.19%	-0.37%	0.76	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[3]	10.26%	-0.82%	0.72	$5,000	0.50% annually	0.07%
Merrill Edge Guided Investing[31]	10.55%	-0.98%	0.7	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 Market Tracking[12]	10.84%	-1.02%	0.72	$5,000	0.30% annually	0.07%
Personal Capital[4]	10.92%	-1.88%	0.67	$100,000	0.89% annually; discounted tiered pricing at higher asset levels	0.10%
Schwab[5]	9.25%	-1.86%	0.57	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	0.18%
SigFig[6]	12.08%	0.38%	0.81	$2,000	No fee for the first $10k; 0.25% annually for balance over $10k	0.06%
SoFi[7]	11.70%	0.14%	0.81	$5	No management fee	0.04%
UBS Advice Advantage[7]	10.88%	-1.77%	0.64	$10,000	0.75% annually	0.14%
Vanguard P.A.S.[43]	10.99%	-0.54%	0.73	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[44]	11.56%	-0.46%	0.7	$500, some additional portfolio features require a higher minimum	0.25% annually	0.09%
Wells Fargo Intuitive Investor[14]	11.95%	0.19%	0.72	$5,000	0.35% annually; discounted relationship pricing may be available	0.13%
Zacks Advantage[29]	11.00%	-0.45%	0.72	$25,000	0.70% annually; discounted tiered pricing at higher asset levels	0.10%

Produced by Backend Benchmarking for BackendB.com

Returns are net of fees and from 06/30/2018 - 06/30/2021. The weighted average expense ratio calculations exclude cash holdings from the portfolio

Top Performers

Year-to-Date Top Performers

	Best	2nd	3rd
Total Portfolio	Schwab Domestic Focus	Wealthfront	Schwab & Morgan Stanley Inflation Conscious
Equity	Schwab Domestic Focus	Wealthfront	Qapital
Fixed Income	Fifth Third Bank OptiFi	Fidelity Go	Schwab Domestic Focus

Produced by Backend Benchmarking for BackendB.com

1-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	Schwab Domestic Focus	Morgan Stanley Robotics	Schwab
Equity	Schwab Domestic Focus	Schwab	Morgan Stanley Robotics
Fixed Income	Fidelity Go	Fifth Third Bank OptiFi	Schwab Domestic Focus

Produced by Backend Benchmarking for BackendB.com

3-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	T. Rowe Price ActivePlus Portfolios IRA	SigFig	Morgan Stanley SRI
Equity	Morgan Stanley SRI	SoFi	Zacks Advantage
Fixed Income	E*Trade Core	Axos Invest	SigFig

Produced by Backend Benchmarking for BackendB.com

5-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	SigFig	Axos Invest	E*Trade Core
Equity	SigFig	Vanguard P.A.S.	Axos Invest
Fixed Income	Schwab	SigFig	Axos Invest

Produced by Backend Benchmarking for BackendB.com

Total Portfolio winners are based on the portfolio's return vs. the Normalized Benchmark. Returns are net of fees and are as of 06/30/2021.

Performance Commentary

- *A rise in CPI tests which robo advisors are prepared for inflation*
- *Wealthfront's strategic allocation to VDE pays off big*
- *Fundamental index funds reward Schwab investors with timely value exposure*
- *Morgan SRI is a top ESG choice and equity performer*

Market Recap: Inflation?

The first half of 2021 has proven to be yet another positive period for the S&P 500 as the index returned 8.55% in the quarter and over 15% for the six-month trailing period ending June 30, 2021. The combination of an increased vaccination rate, robust earnings growth, and persistent easy monetary policy all supported stock market returns. According to CNBC, the average GDP estimate for the second quarter is 7.5%, annualized. Overseas, the MSCI EAFE rose 5.35% in the quarter driven by strong performance in Europe. A similar story of easy central bank policy in tandem with growing vaccination rates has propelled returns. The MSCI Emerging Market Index posted a 5.12% return number, which, albeit a slight underperformer, is a positive sign for global markets.

However, as the U.S. economy recovers from COVID lows, there has been a notable rise in Consumer Price Index (CPI), which has had an impact on market dynamics. According to the Bureau of Labor Statistics, the CPI for All Urban Consumers increased 5.4% from June 2020 to June 2021. This is the "largest 12-month advance since the year ending August 2008," according to reports from the Bureau. Still, thanks to successful messaging from the Federal Reserve indicating their belief that the current inflation will be transitory, 10-year Treasury rates came down from 1.74% at the end of the first quarter to 1.45% at the end of the second quarter. As a result, despite longer-duration bonds selling off tremendously in the first quarter, they outperformed substantially in the second quarter.

The CPI increased 5.4% from June 2020 to June 2021. This is the largest 12-month advance since August 2008.

Even as the Federal Reserve appears to have soothed market fears over rising prices, from a year-to-date perspective, there has been a notable change in the drivers of return. Investors may have grown accustomed to the significant outperformance of growth investing over value. In fact, over the 3-year trailing period ending June 30, 2021, the Russell 3000 Growth Index returned 92.84%, cumulatively, while the Russell 3000 Value Index returned 41.29%, cumulatively. However, year-to-date, those same indices returned 12.70% and 17.65%, respectively, for the period ending June 30, 2021. As the U.S economy re-opens doors, those areas of the market that have experienced the sharpest declines are poised for growth. We see a similar dynamic in market capitalization. For the first two quarters of the year, small and mid-cap stocks modestly outperformed large-cap names, despite a different story over three years.

For the first two quarters of the year, small and mid-cap stocks modestly outperformed large-cap names, despite a different story over three years.

YTD: Schwab, Wealthfront, and Morgan's Inflation Theme Shine

Year-to-date, we are looking at a new group of top-performing robo advisors. Rather than relying on a U.S. large-cap growth tilt, our year-to-date winners, Schwab Domestic Focus, Wealthfront, Schwab's standard portfolio, and Morgan Stanley's Inflation Conscious portfolio, experienced different drivers of return. This year-to-date analysis puts a spotlight on some of the more interesting and unique aspects of portfolio construction for robo advisors.

To start with, Schwab Domestic Focus and Schwab's standard option won first and third place, respectively. Schwab Domestic Focus was the leading robo advisor year-to-date, returning 3.44% above its Normalized Benchmark, while the average was 0.25% for the group of 73 robo-advisor accounts in the universe. The account was also first place in equity-only returns, printing a 17.89% return on the period and outperforming the S&P 500, which returned 15.24%.

Schwab Domestic Focus was the leading account year-to-date, returning 3.44% above its Normalized Benchmark, while the average was 0.25%.

When looking at the drivers of return for both Schwab accounts, there are a few major themes. First, nearly half of Schwab's equity portfolio was invested in fundamental index funds. These are ETFs that weight stocks by their fundamentals, like cash flows, sales, and dividends. This resulted in a substantial value tilt. For example, FNDX, Schwab's fundamental U.S. large-cap ETF, and FNDA, the small-cap version, held 49% value stocks and 42% value stocks, respectively, while both funds held less than 15% growth names. This resulted in both funds contributing to strong performance over the shorter time periods where value has outperformed growth. For investors in Schwab's Intelligent Portfolios, if the backdrop of economic recovery continues, these fundamental ETFs may continue to drive relative returns.

When looking at the bond portion of the Schwab portfolios, there are a few aspects of which to take note. First, both Schwab portfolios placed in the top 10 for fixed-income returns. Both Schwab accounts opted for a high allocation of more than 50% of the fixed income portfolio to municipal bonds. Additionally, there were significant allocations to inflation-linked Treasury bonds. While the Bloomberg Barclays US Aggregate Index was down -1.60% YTD, both municipal bonds and TIPs generally showed positive returns. Different from other accounts, Schwab's bond portfolio is relatively attractive in a rising inflation environment.

The other major factor to consider with investing in Schwab's Intelligent Portfolios platform is the cash position. Currently, both of our accounts tracked at the *Robo Report* hold close to 10% cash. As has been well-documented in previous *Reports*, as well as in our special report on Schwab in this edition, we consider this high cash allocation to be a cost for the product. With that said, this cash allocation does provide some protection from a rise in interest rates.

Inflation-Fighting Robo Advisors?

Wealthfront and Morgan Stanley's Inflation Conscious portfolio took second place and tied for third place, respectively. Wealthfront's equity portfolio stands out for its unique holding of VDE, a Vanguard Energy ETF that tracks stocks in the energy sector. This fund returned 49.05% for the 6-month period ending June 30, 2021, significantly outpacing the S&P 500. Wealthfront's allocation of nearly 10% of its equity holdings to this fund paid off tremendously for investors. In tandem with a 10% allocation to SCHD, a dividend-payers ETF, Wealthfront successfully complemented its equity portfolio with two funds that were stellar performers for the last six months. Wealthfront's thoughtful VDE allocation did what it was designed to do (protect against inflation) while SCHD captured the value rotation nicely when looking at more recent performance periods.

Wealthfront's equity portfolio held VDE, a Vanguard Energy ETF. This fund returned 49.05% year-to-date.

When looking at Morgan Stanley's Inflation Conscious portfolio, the first thing that stands out is that it successfully delivered on its theme by performing best in response to the rising specter of inflation. PBDC, a diversified commodity strategies fund, and TPYP, a consumer energy fund specializing in pipelines, were two of the unique holdings that propelled returns. Commodities surged during the year due to the recovering economy and limited supply, resulting in strong growth of prices across lumber, rubber, and other commodities. Meanwhile, with the advent of the Biden administration's potential infrastructure bill, pipelines may continue to demonstrate a strong return profile. Both of these funds, along with high allocations to REITs, made this inflation-conscious portfolio fulfill its intention.

Morgan's Inflation portfolio was supported by pipelines and commodities.

From a fixed income perspective, Wealthfront's 100% municipal bond allocation successfully outperformed aggregate bond indices, as noted previously. Morgan's Inflation Conscious portfolio was bolstered by TIPs and short-duration bond funds like MINT. If investors anticipate a regime where the Fed becomes less accommodative due to inflation concerns, these asset classes may help defend the portfolio.

3-Year Winners: T. Rowe Price, SigFig, and Morgan Stanley SRI

Our T. Rowe Price Active Plus account returned 0.41% over its Normalized Benchmark for the 3-year trailing period ending June 30, 2021; the average robo underperformed by -0.70% over the same period. T. Rowe's account has no management fee but average fund fees of 0.79%. This is also one of the few advisors we track that utilizes its own actively managed mutual funds for the majority of its investment portfolio. Some mutual funds stand out for outperformance against a comparable index. The T. Rowe Price Small-Cap Stock fund, OTCFX, dramatically outperformed the Russell 2000 index, a small-cap index, by over 24%, cumulatively, for the 3-year trailing period ending June 30, 2021. When looking at the overall portfolio, a Sharpe ratio of 0.70 ranked in the middle of the pack of 26 other robo portfolios, showing a compelling risk-return profile for an entirely equity-oriented portfolio. T. Rowe's active management has done well for investors thus far.

The T. Rowe Price Small-Cap Stock fund, OTCFX, dramatically outperformed the Russell 2000 Index by over 24%.

SigFig is a perennial favorite in the *Robo Rankings* thanks to a compelling combination of features, cost, and performance. The equity portfolio consists of a U.S. large-cap growth bias which has served investors well in recent years. SigFig's allocation to VTI, Vanguard Total Stock Market Index, has worked well despite its simplicity. Investors should be aware, however, that a major theme with U.S. total stock market ETFs is that they have developed a growth tilt. VTI, for example, has 36% growth stocks and just 23% value. This is a trend that has become exacerbated by the rise in the price of technology names driving the market. Other robo advisors like Schwab, Wealthfront, and Betterment have added holdings that specifically tilt the portfolio towards value, whether from value stock ETFs like VTV or fundamentally weighted ETFs like SCHB. Diligent investors may want to realize that if their robo advisor is holding total stock market ETFs, which many are, they are getting a growth-oriented portfolio despite not having "growth" in the name. This has served investors extremely well in recent years, but a change to the market environment could be an unexpected headwind.

Beyond equities, SigFig placed 3rd for 3-year fixed income returns, out of a group of 25. The portfolio's largest fixed income allocation to SPAB is notable due to its duration of 6.62. Long- and intermediate-term issues have substantially outperformed short-term issues thanks to the 10-year Treasury rate falling from 2.85% at the end of June 30, 2018, to 1.45% just three years later. This can be a useful asset in periods of declining rates but can be a liability in rising inflation. If investors are concerned with the recent CPI numbers, pairing investment-grade long-term bonds with shorter-term issues, TIPs, and higher-yielding bonds may make sense.

Morgan Stanley SRI's story is unique. When looking at the equity allocation, the portfolio's expenses were a high 0.46%, thanks to an equity portfolio that holds 100% ESG-themed funds. Additionally, out of our study group of six other SRI-themed robo advisors, its equities had the best ESG risk score. There has been a correlation between ESG-themed funds and a growth tilt. Morgan's equity portfolio has a growth tilt of 33% compared to just 21% value. Although time will tell how the strong ESG score, the growth orientation, and the high expense ratio plays out for investor's bottom line, so far, the SRI-themed portfolio with the best ESG score has been the best performer. For more information, please review the SRI analysis later on in the commentary.

The SRI-themed portfolio with the best ESG score has been the best performer.

SigFig and Axos: Picks for the Long Haul

While the average of the 10 robo advisors we track with 5-year performance was -0.81% versus the Normalized Benchmark, SigFig and Axos outperformed the average, returning 0.24% and -0.04%, respectively, for the trailing 5-year period ending June 30, 2021. SigFig's 61% allocation of its equity portfolio to U.S. total stock market ETFs, primarily VTI, made for a simple but compelling stock portfolio. Additionally, SigFig stands out for a significant allocation to emerging market stocks; our account holds a more equal weight of emerging markets to foreign developed markets, which boded well considering the MSCI Emerging Markets Index returned 20% more than the MSCI EAFE Index (foreign developed stocks), cumulatively, for the 5-year period ending June 30, 2021. If emerging market economies continue to rebound in light of increased vaccination rates and opening economies, this volatile asset class can significantly boost performance.

On the fixed income side of the portfolio, SigFig's intermediate-to-long duration portfolio of primarily investment-grade issues boded well. The portfolio's 6.4 years of effective duration benefited investors during a time when long-duration and intermediate-term bonds outperformed their short-term counterparts. Furthermore, SigFig complemented its aggregate bond ETFs with emerging market bonds and TIPs, which returned more than 20% each, cumulatively, for the 5-year period ending June 30, 2021.

Axos also impressed for 5-year return numbers when compared to the Normalized Benchmark. Similar to Sigfig, Axos holds significant allocations to total U.S. stock market ETFs, specifically SCHB and VTI, which together make up 57% of the equity portfolio. As has been mentioned already in the commentary, simple portfolios that rely on total U.S. stock market ETFs continue to perform well. When looking at the bonds in the account, Axos owed a significant amount of outperformance to its allocation of investment-grade corporate bonds. VCIT, an intermediate-duration investment-grade corporate bond fund, which is just under 25% of the bond portfolio, returned 24.69%, cumulatively, while the Bloomberg Barclays Aggregate Bond index returned 16.07%, cumulatively, for the 5-year trailing period ending June 30, 2021. Furthermore, Axos' bond portfolio was propelled by LQD, a longer-duration corporate bond fund, and TIP, an inflation-protected U.S. Treasury bond fund, which had cumulative returns of 28.18% and 21.62%, respectively, for the 5-year trailing period.

When looking at long-term performance, investors can see that SigFig and Axos have done well over the last five years when stacked up against their Normalized Benchmark. Although predicting future performance is difficult, the fact that both portfolios are invested in primarily U.S. large-cap companies and intermediate-term investment-grade bonds, while still having reasonable levels of diversification across the portfolio, makes both options a compelling choice for the long-term investor.

SigFig and Axos have done well over the last five years when stacked up against their Normalized Benchmark.

Socially Responsible Investing: ESG Scores, Fees, and Performance

Socially Responsible Investing (SRI), also known as Environmental, Social, and Corporate Governance (ESG) investing, remains a hot trend in the investment industry. According to reports from Morningstar, SRI-themed ETFs and mutual funds had “net flows of $51 billion in 2020, more than double the total of 2019” and, perhaps even more surprisingly, these flows were “10 times more than 2018”. At the *Robo Report*, we compare the equity portfolios of SRI-themed robo advisors and their standard counterparts at the same provider to analyze their differences.

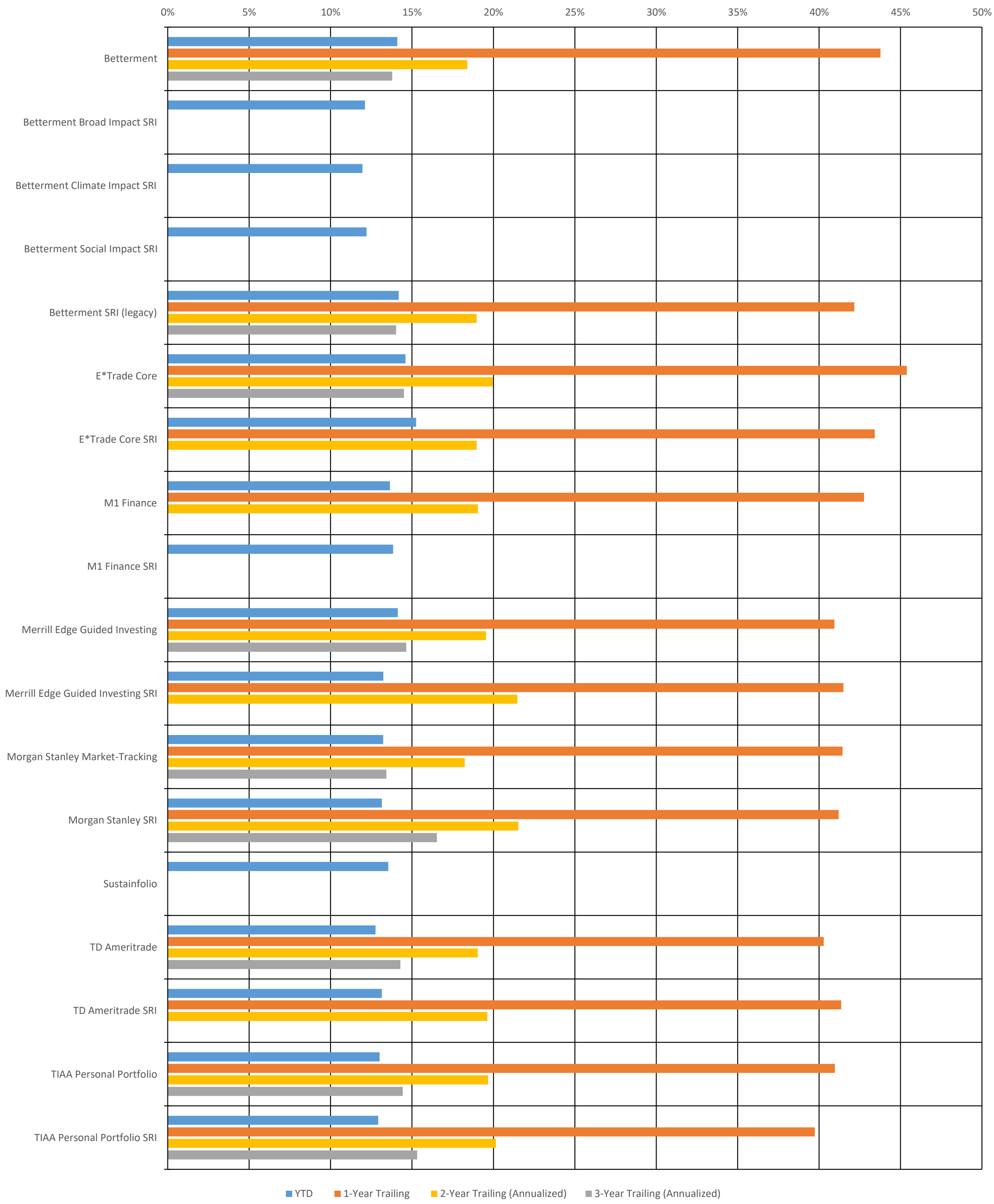
SRI-themed ETFs and mutual funds had “net flows of $51 billion in 2020, more than double the total of 2019”.

When looking at just the equity portion of the overall portfolios, five of the six pairs of SRI-themed portfolios outperformed their standard counterparts on a 2-year trailing basis for the period ending June 30, 2021, including Morgan Stanley, Merrill Lynch, TIAA, Betterment, and TD Ameritrade. The equity portfolios of the standard options earned an average return of 19.14%, while the SRI options returned 20.13%. Furthermore, this outperformance occurred despite significantly higher fund fees; the standard group’s average fund fees are 0.06%, while the SRI group’s average is 0.26%.

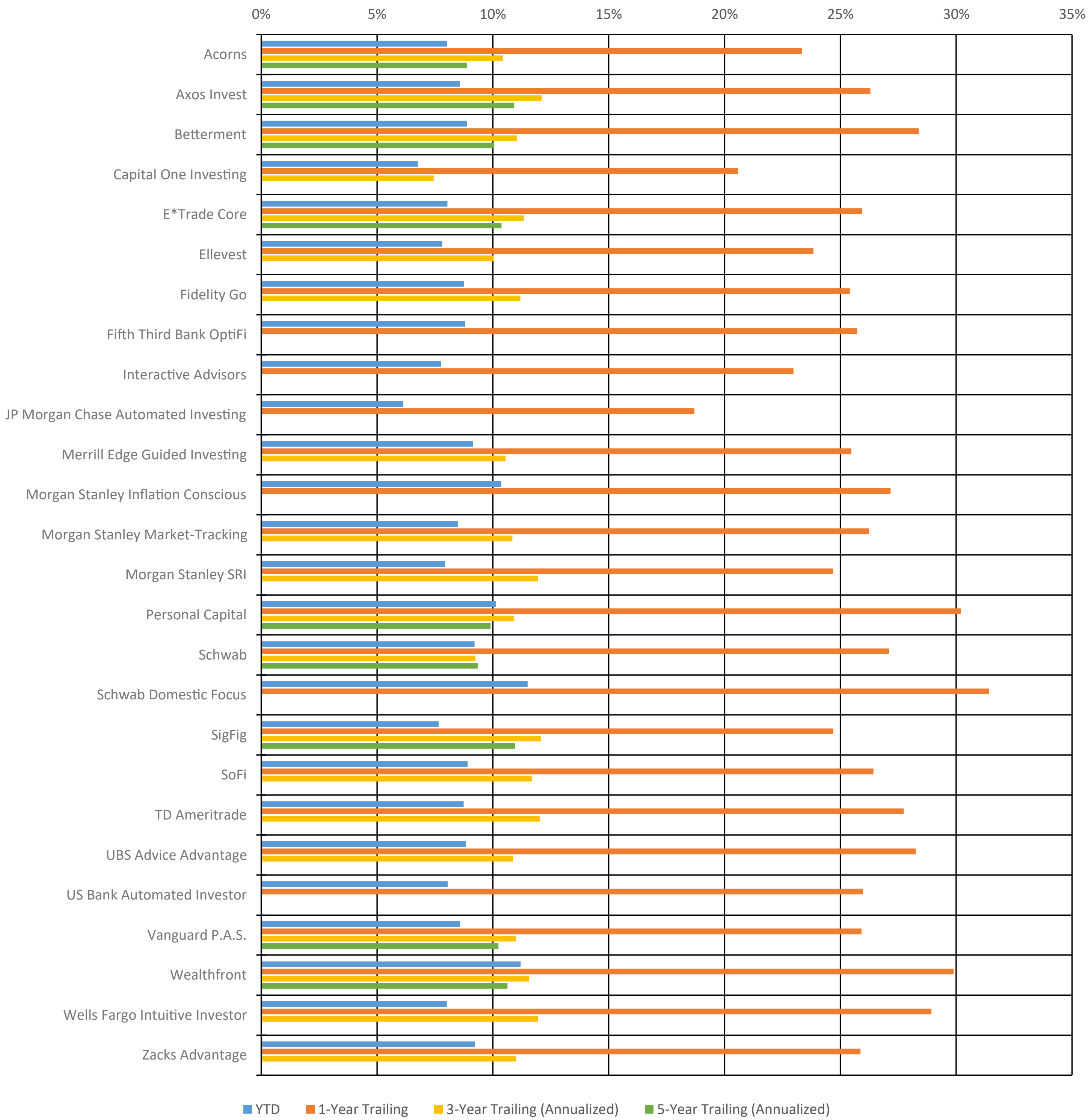
When digging into the drivers of return, there are a few points to consider. First, the SRI-themed portfolios in all six scenarios had a higher percentage allocated to growth stocks. For example, the top performer of the category, Morgan Stanley SRI, is allocated to 33% growth and 21% value, while the standard option was allocated to 29% growth and 28% value. This was at a time when the Russell 3000 Growth Index returned 74.35%, cumulatively, and the Russell 3000 Value Index returned 31.65%, cumulatively, for the 2-year trailing period ending June 30, 2021. Another contributing factor was allocations across market-caps. Four of the five outperforming SRI-themed robo advisors had a larger average market cap amongst portfolio holdings. Betterment, for example, had an average market cap of $47 billion for the SRI theme and just $39 billion for the standard option. Meanwhile, Merrill Edge’s SRI theme had an average market cap of $87 billion, while the standard option had just $71 billion. This bolstered performance in a period when the Russell 200 and Russell 1000, a mega-cap and large-cap index, respectively, modestly outperformed the Russell Midcap and Russell 2000 index, a mid- and small-cap index, respectively.

When looking at the ESG scores themselves, we use Portfolio ESG Risk Scores from Morningstar to better understand the implications of these conscientious options. Note that the lower the score, the less of a risk the security is from a sustainability perspective. The average standard robo had a score of 23.26, while the SRI-themed average was 21.48 for the six robo advisor pairs in the 2-year study group. For context, scores between 10-19.99 are Low ESG Risk, 20-29.99 are Medium ESG Risk, and 30-39.99 are High ESG Risk. In all six pairs, there was a persistent reduction of ESG Risk between one and three points, moving towards Low ESG Risk and away from Medium Risk. Notably, the highest performing portfolio, Morgan Stanley SRI, had the lowest (best) ESG Portfolio Risk score of the group. It has yet to be seen if spending more in fund expense ratios is worth a modest few points of ESG Risk reduction. But if SRI themes continue to outperform, conscientious investors can have their cake and eat it too.

SRI Account Equity-Only Performance



Total Portfolio Performance



Industry Trends and Outlook: A Year in Review

- *Robo advice industry grows an estimated 25% year-over-year*
- *Betterment adds more than $10 billion in AUM*
- *Edelman Financial Engines and Vanguard P.A.S. dominate in size*
- *Schwab pays $200 million in fines*
- *Vanguard buys direct-indexing technology, joining the pack*

Analysis: Robo Advisor AUM Growth

At the end of 2020, we estimate that robo advisors managed approximately $785 billion in assets, up from $631 billion at the end of 2019. This represents roughly 25% year-over-year growth. While AUM growth had a tailwind of positive market returns for the year, 25% growth in AUM for a maturing industry is strong. Of this $785 billion, $77 billion is invested with independent fintech providers, $395 billion is managed by employer plan providers, while incumbent financial institutions manage approximately $313 billion.

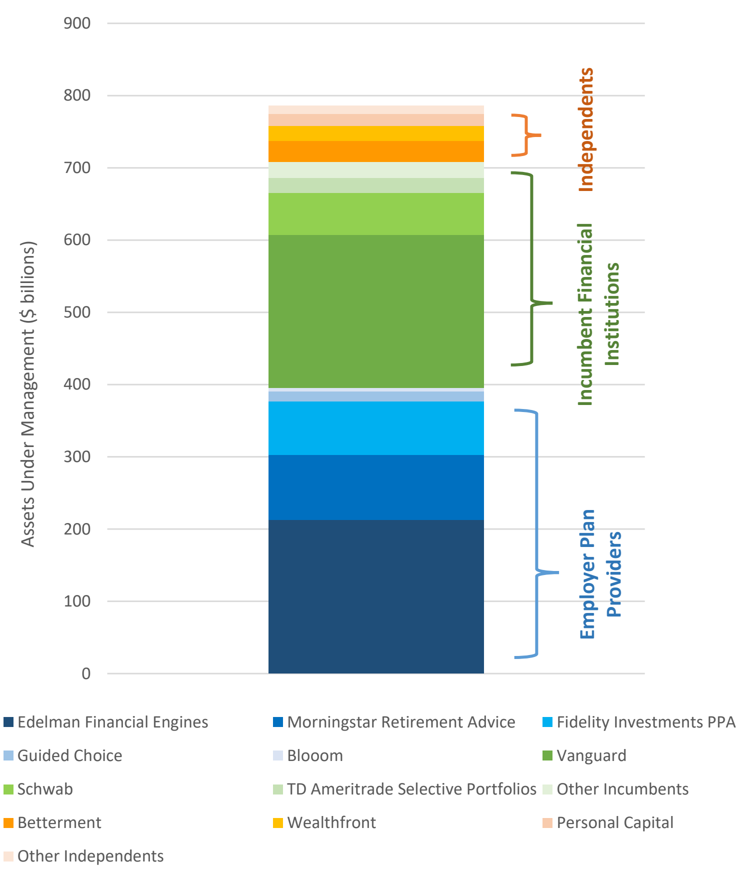
This represents 25% year-over-year growth.

While leading independent robo advisors lead the sector in innovation, assets are dominated by a few incumbent institutions. Financial Engines and Vanguard Personal Advisor Services are now on par with each other in terms of AUM, both managing around $212 billion in assets at the end of 2020. Combined, these two firms make up more than half of the total AUM of the industry. Schwab's digitally advised assets ended 2020 at nearly $60 billion, more than double the largest independent robo advisor, Betterment, at $28 billion.

Edelman Financial Engines and Vanguard make up over half of the total AUM.

Although leading independents have long since been eclipsed by the robo platforms of Schwab and Vanguard, their path has been much more difficult. Schwab, Vanguard, and others entered the market with vast pools of existing clients and household brand names. Each Betterment or Wealthfront client must be a new-to-platform client; Schwab and Vanguard have the much easier path of converting existing clients into digital advice products. Despite this more difficult path, we estimate that Betterment and Wealthfront grew by more than 50% in 2020. Betterment alone added $10 billion in managed assets over this period.

2021 Digital Advice Market AUM



Although our group of the leading five providers grew 33% year-over-year, success with digital advice products has not been universal. False starts have accompanied this industry since the beginning. Prudential Link closed earlier this year, joining the ranks of Motif, Learnvest, Hedgeable, Swell, and others.

False starts have accompanied this industry since the beginning.

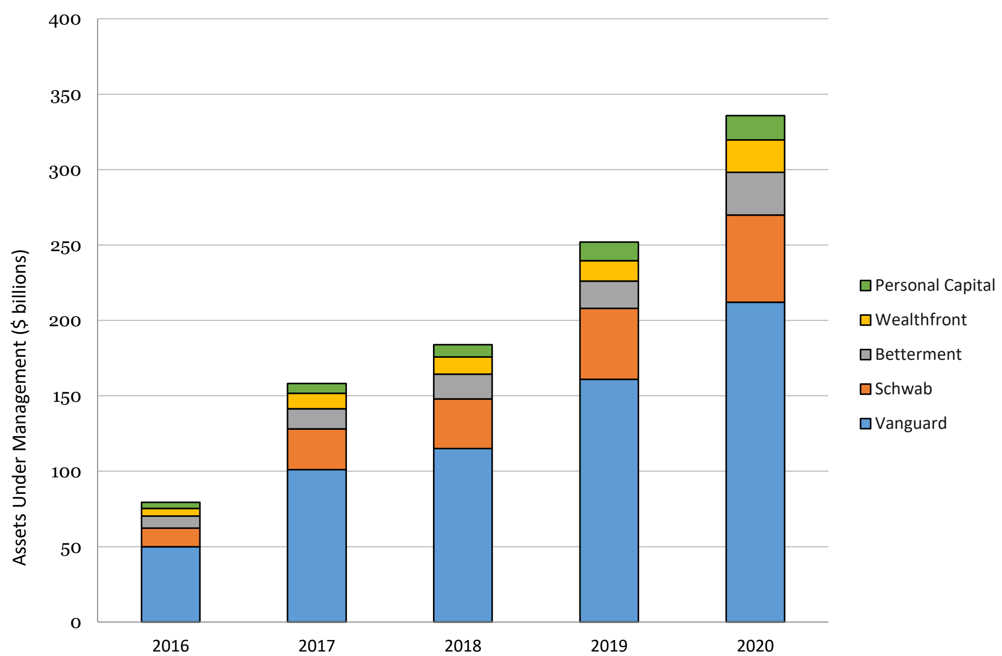
While many robo platforms have shuttered their doors, growth on other platforms has not been as bright as the industry leaders. TD Ameritrade's Essential Portfolios assets are now reported under Schwab's digitally advised assets following the merger. The last time we saw a standalone AUM figure on Essential Portfolios was in June of 2020, and the digital-only robo had amassed just $1.6 billion in assets since launching in 2016. While Fidelity does not publish an AUM figure for Fidelity Go, the Fidelity Flex mutual fund family, which makes up the underlying portfolios of the Fidelity Go account, holds less than $6 billion in assets combined. Meanwhile, Goldman Sachs acquired retirement robo Honest Dollar in 2016. Nearly five years later, it finally integrated the relatively unchanged product with its burgeoning Marcus brand, which begs the question of what took Goldman so long.

Robo advisors have greatly expanded the markets for financial advice, bringing minimums and fees down to levels where anyone can access a cost-effective managed portfolio. Although robo advice has had a clear and positive impact on the accessibility for individuals, it has been difficult for many firms to find a way to serve smaller clients at a large enough scale to achieve profitability.

Schwab Pays Fines

The first half of 2021 also witnessed major fines against firms. Schwab recently disclosed it expects a $200 million charge related to an SEC action against its robo platform. Although Schwab has not disclosed details, there is speculation that it relates to the high cash allocation within its managed portfolios. This cash holding helps Schwab generate revenue from the product and that may not have been properly disclosed. See the Schwab cash allocation impact story for more details on our estimates of how much this high cash allocation has cost clients. In another story, Robinhood announced it will pay $70 million in penalties for outages and misleading communications with clients.

AUM Growth at Selected Providers



A Maturing Industry Goes Public

More than 10 years after the first direct-to-consumer robo advice platforms launched, the industry is entering a more mature phase. SoFi was the first start-up with a robo advice platform to go public earlier this year through a SPAC. Acorns soon followed suit, also announcing plans for a SPAC merger in May. Although not a robo, investing app Robinhood went public in July of this year. Meanwhile, Betterment founder Jon Stein stepped down and was replaced by former ViacomCBS executive Sarah Levy, and Wealthfront added Jaleh Bisharat, marketing heavyweight, to its board of directors. Some speculate these personnel moves are in preparation for a possible public offering.

SoFi was the first start-up with a robo advice platform to go public earlier this year through a SPAC.

As the industry matures, platforms are also trying to expand services and features. Catering to these trends, Wealthfront has started to allow self-directed customization of portfolios and announced tentative plans to develop crypto trading on their platform as well. The rapid rise in the popularity of day trading and cryptocurrencies can present robo advisors with an interesting dilemma. It is well-documented that individual investors typically underperform markets and can benefit greatly from letting a professional manage their portfolio. While offering customization and cryptocurrency trading may help Wealthfront attract more clients, it may actually hinder their clients from achieving their long-term goals by letting them take the wheel. Regardless, fintech platforms are growing well past their roots. SoFi, originally a lender, now offers banking, self-directed investing, managed accounts, proprietary funds, and is even offering some clients the ability to invest in IPOs. Many successful platforms are expanding services with the goal of becoming a one-stop-shop for an individual's personal finance needs.

Trends of the Future

Looking forward, we see two major trends in the development of new features. The first is a tighter integration and automation of spending, savings, and long-term goal planning. This began with the introduction of cash savings and spending accounts, which are now ubiquitous across robo platforms. Wealthfront's Self Driving Money is a glimpse at the automation of an individual's short-term spending and saving being linked to long-term financial planning goals.

The second trend is surrounding direct indexing capabilities. In July of this year, Vanguard joined the ranks of Schwab, Morgan Stanley, Goldman Sachs, and Blackrock, who have all acquired direct indexing technology since the start of 2020. While we have yet to see how this technology will be utilized by these firms and what consumer-facing features they will launch, direct indexing has some interesting use cases for the customization of portfolios. One use case for direct indexing aligns with the growing popularity of ESG investing. By owning the underlying securities in an index, a firm can implement ESG-based screens to avoid buying specific companies or industries while still tracking the remaining holdings of an index. ESG aside, direct indexing opens the door to more client-specific customization. We are excited to see how direct indexing will be implemented for the end client.

Vanguard joined the ranks of Schwab, Morgan Stanley, Goldman Sachs, and Blackrock, who have all acquired direct indexing technology.

Special Report: The Unseen Cost of Free Advice at Schwab

- *We estimate that Schwab's high cash allocations in Intelligent Portfolios cost investors $1.13 billion in total earnings when compared with potential returns if Schwab invested the cash in the fixed income portion of its portfolio*
- *We estimate that clients earned $531 million less than if Schwab had charged a 0.30% fee and invested the cash into the same fixed income assets that are held in the portfolio*
- *Charging a 0.30% management fee would have increased Schwab's revenue by an estimated $369 million*

Background: Generating revenue by holding cash

When Schwab introduced its digital advice product, Intelligent Portfolios, in 2015, we noticed that they held an unusually high amount of cash. For example, our Intelligent Portfolios account has carried around a 10% cash allocation since it was opened in 2015. Seeing that Schwab did not charge a management fee for this product, it became apparent to us that the high cash allocation was likely driven by their ability to generate revenue on the cash balances, not sound portfolio construction.

Our account has carried around a 10% cash allocation since it was opened in 2015.

In July, Schwab disclosed that investors can expect a $200 million charge relating to an SEC investigation of Intelligent Portfolios and its past disclosures. It has been widely speculated in the media that this charge is directly related to the high cash allocations in its portfolios, although this is entirely unconfirmed and the details of the SEC investigation are not yet public.

Currently, Schwab discloses how the cash helps it generate revenue. Schwab sweeps the cash into Schwab Bank, providing the bank with a source of low-cost deposits. The less a bank pays on its deposits, the greater the profitability of its lending activities. Schwab states in the Disclosure Brochure for Schwab Intelligent Portfolios (SIP) that "Schwab does not charge an advisory fee for the SIP Program in part because of the revenue Schwab Bank generates from the Cash Allocation (an indirect cost of the Program)."

Schwab sweeps the cash into Schwab Bank, providing the bank with a source of low-cost deposits.

The problem for SIP clients is that equity and bond markets have both experienced strong returns for the last six years, making cash a costly investment. Leveraging the knowledge we have of our account at Schwab, what it holds, and how it has performed since we opened the account in 2015, we set out to answer some questions: What did the high cash allocation cost clients? What did it earn for Schwab? And how would it have been different if Schwab charged a standard management fee?

To answer these questions, we simulated two portfolios: one with the cash invested in the fixed income portion of the portfolio, and a second with the cash fully invested in the same fixed income holdings as the current portfolio, but with a 0.30% management fee. Using published figures for Intelligent Portfolios' Assets Under Management (AUM) over the period, we were able to calculate estimates for how much

Intelligent Portfolios clients lost in portfolio growth.

The Results: How much growth did clients miss?

For the 6-year trailing period ending June 30th, 2021, we estimate that clients with SIP earned a total of $531 million less than if Schwab had simply charged a 0.30% management fee and invested the cash into the same fixed income assets that are held in the portfolio. Using a high cash allocation to generate revenue allows Schwab to market the product as carrying no management fee, and to the client, the cost of the high cash allocation becomes embedded in the performance of the portfolio. If we had not introduced this 0.30% management fee, we estimate the no-cash portfolio would have earned investors $1.13 billion more over this period.

We estimate that clients earned $531 million less than if Schwab had charged a 0.30% fee and invested the cash into the same fixed income assets that are held in the portfolio.

This estimate results from our real, high-cash portfolio returning a cumulative net-of-fees return of 57.56%, the simulated no-cash portfolio returning 62.41%, and the simulated portfolio with no cash but a 0.30% management fee returning 59.55%. We estimate the no-cash portfolio would have returned a total of 4.85% more, while the no-cash portfolio with a fee would have returned a total of 1.99% more over the previous six years.

Clients would have been significantly better off had Schwab charged a straightforward and transparent management fee instead of deciding to earn revenue through high cash allocations. Although not charging a management fee may make sense from a marketing perspective, using a high cash allocation instead of a transparent fee has handicapped the performance of these portfolios and ultimately hurt clients.

Although Schwab currently discloses how it generates revenue from the cash sweep program, investors still do not know how much it is costing them in portfolio growth. If a client cannot answer the simple question of "what do you pay your investment manager?", there is a transparency issue.

The Results: How much revenue did Schwab lose?

Moving on from the client experience, how did Schwab itself make out by implementing this strategy? Schwab disclosed in the first quarter of 2021 that Schwab Bank earned around 0.97% on an annual basis on the cash invested, net of what it paid to clients in the program. By estimating Schwab earns roughly 1% in revenue on cash, and portfolios held on average 10% of their portfolios in cash, we can estimate revenues for Schwab.

We estimate that Schwab earned approximately $185 million in revenue from the cash. Had they charged the 0.30% management fee they would have earned $554 million. So, not only did clients lose money, we estimate Schwab lost $369 million in revenue by choosing this model.

We estimate Schwab lost $369 million in revenue by choosing this model.

Methodology and Notes:

We simulated a portfolio return using the equity-only and fixed income-only returns of our SIP account, which is invested in a moderately aggressive portfolio. A weighted average calculation was performed on these asset class returns as if the weight of the fixed income holdings also included the weight of the cash holding. These weighting calculations were performed on a daily basis using the real returns and the real weights of the cash, equity, and fixed income asset classes in our account. To introduce a 0.30% annual management fee, we added management fee transactions at each quarter-end. These fees were calculated as .075% (¼ of 0.30%) of the quarter-end value of our account. The resulting portfolio is as if Schwab had invested all of the cash in the portfolio into the same fixed income holdings as the original account and also charged a 0.30% annual management fee assessed quarterly.

To calculate the total cost to clients, we analyzed each year in the period from 06/30/2015 to 06/30/2021. We used ending year AUM figures published by Schwab to calculate an average AUM for the period. We then used the performance of our Schwab account and the simulated Schwab portfolio performance to estimate how much assets would have grown based on the average AUM for the period. We then summed the differences of these figures for each period to arrive at our total cost to clients figure.

This analysis is based on the performance and cash allocation of our account, which averaged around 10% cash for the life of the account. Schwab discloses that SIP cash allocations can vary between 6% and 30% depending on the model selected for a client. On this note, Schwab provides an example in its disclosures of how much revenue it might earn on a theoretical account here. In this example, Schwab itself assumes an account with a 10% cash allocation, the same as our account. If Schwab uses a 10% cash allocation account in their own disclosures as an example account, we are comfortable also using a 10% cash allocation account as the basis for these estimates.

This analysis focuses on the cash component of these portfolios and its role in revenue generation. Schwab also generates revenue by methods other than a management fee, which can be found in Schwab disclosures. SIP Premium also charges a program fee in the form of a one-time start up fee and then a flat dollar monthly fee. Our understanding is that Intelligent Portfolios Premium portfolios also mandate high cash allocations.

Currently, Schwab discloses conflicts of interest and other matters regarding the cash allocation. The CRS and Disclosure Brochure for this product suite can be found here: https://www.schwab.com/public/file/CMS-BDL 100049 or on the IAPD website: https://adviserinfo.sec.gov/firm/summary/5393

Robo Ranking Methodology

How We Rank the Robos

The robo advisors are ranked on a comprehensive set of criteria. The final robo score is made up of a qualitative score of their services, platform, and features, and a quantitative score based primarily on the costs and performance of the portfolio. A small portion of the quantitative score is based on the size, and tenure of the robo advice product. When looking at the qualitative aspects of the service, we focus on six categories: financial planning, user interface and customer experience, product features, access to live advisors, transparency and conflicts of interest, and minimum investment.

Below, we give examples of what earned points in each category.

Financial Planning:

Here we graded the platforms on the quality of financial planning services offered. Robos that allowed users to build or create single or multi-goal financial plans were awarded points. Other financial planning tool features that earned points were those that allowed for "what if" scenarios; helped users calculate retirement spending needs, including social security benefit estimates; allowed for the inclusion of pension or other retirement income; and offered suggestions on appropriate monthly saving goals. In this issue of the *Ranking*, points were awarded if their planning tools had specific functionality. For example, if the single-goal planning tool could: One, model future account values or spending; two, accept a user's input of an account value or spending goal; and three, show either a likelihood of success or changes to improve goal outcomes, then all points were awarded. If only some of these features were present, then partial points were awarded. Note that half points were awarded instead of full points if the financial planning feature was only made available at a higher tier or for an additional cost.

User Interface and Customer Experience:

Here we evaluated the user interface and the digital customer experience. We looked at the ease of getting to basic account information and the general accessibility of the site. We measured the number of clicks required to access basic account and portfolio information, and used third-party software to produce an "accessibility score." Points were also awarded to platforms that had good content and articles on basic personal finance and investing topics. During onboarding, we looked to see if the onboarding questionnaire took into account a user's comfort with investing and inquired or mentioned whether the user has an emergency fund. We also scored robos that had the ability to aggregate held-away accounts for a holistic financial picture. Availability of live chat options and mobile apps also helped robos score higher in this category.

Product Features:

Robos were awarded points for different types of features. Tax-loss harvesting, tax efficiency, tax location strategies, smart dividend reinvestment, ability to trade fractional shares, cash management features, types of accounts offered, access to impact or other themed portfolios, and the ability of a robo to customize a portfolio to a specific customer situation were the features we looked for in this category. We also included a field for unique and additive features that were not explicit in our scoring. This was a small portion of the overall features score. In the latest 06/30/2021 edition of the Robo Ranking, there is an update. The 1 point awarded for tax-allocation strategy and 1 point for offering themed portfolios has been replaced by a 2-point category for an ESG-themed portfolio offering.

Transparency and Conflicts of Interest:

In this category, we looked for things like whether or not a user could easily compare their portfolio to relevant benchmarks to help them understand performance. We also awarded points for platforms that made their models available before account opening or becoming a client, and further points if they also published the performance of their models publically to prospective customers. Availability of white papers and other information on how portfolios are constructed were also awarded points. We also awarded points to those portfolios that did not rely entirely on proprietary products or chose no proprietary products when constructing their portfolios.

Access to Live Advisors:

Robos with access to live advisors, or the ability to upgrade to a product that has live advisors, earned points. Advisors need to be able to advise or provide financial planning guidance on customer-specific questions to score points. Live customer service and operational support are not sufficient for us to consider it a live-advice relationship. Robos earned more points if there was a dedicated live-advisor option, if they required their advisors to hold CFPs, and the minimums at which live advisors are made available. Partial points were awarded to frms that had products or programs with live advisors if they are offered at a higher service tier, higher minimum, or for additional cost.

Account Minimum:

Robos earned points for having lower investment minimums.

Costs:

We scored costs on the sum of the management fee and average-weighted expense ratio rather than scoring these two components separately. This method better reflects the true cost incurred by clients. Additionally, we consider a cash allocation as a cost if the cash holding is earning less than a competitive rate which is set based on prevailing market rates for each ranking. If a cash position was earning 0.20% or more, robos received full points in this section. The cash allocation had a much smaller impact than management fees and weighted expense ratios.

Performance:

We used two metrics to grade a robo's performance. The first was the Sharpe ratio, which is a measure of risk-adjusted returns. The second was their return above/below the Normalized Benchmark. This measurement method reduces the impact of different equity/bond allocations in the portfolio. The method of using a Normalized Benchmark was created by the team at the Robo Ranking™ and is explained in detail in the Normalized Benchmarking section on the website. The performance time period analyzed is consistent across all robos in each ranking.

Size and Tenure:

This score is based on the AUM and age of the robo advice products. Large amounts of AUM and older products are less likely to be discontinued in the future, forcing a client to change providers or products, which can be disadvantageous to the client. Robos that do not publish their AUM specific to the robo advice product only received the points available for the age of the robo. We encourage robo advisors and their parent companies to release AUM data for their different products in the interest of transparency to the investor.

Terms of Use ("Terms")

Last updated: 7/1/2020

Please read these Terms of Use ("Terms", "Terms of Use") carefully before subscribing to the *Robo Report™* and the *Robo Ranking™* ("Our Research", "Research") distributed by BackEndB.com, LLC ("The Company") through the websites https://theroboreport.com/ and https://backendbenchmarking.com/ ("Websites", "Website").

Your access to and use of Our Research is conditioned on your acceptance of and compliance with the Terms. These Terms apply to all subscribers and others who access or use Our Research.

The Company reserves the right to change these terms at any time without notice. By continuing to subscribe to Our Research, you agree to abide by them.

Our Research focuses on digital services providing automated investment advice ("Robo", "Robos"). A "Covered Robo" is any Robo for which the Company publishes historical return data in Our Research.

Our Research is copyrighted and owned by the Company. Use of Our Research for commercial purposes is strictly prohibited without written consent or a license, except for Covered Robos who wish to use Our Research for marketing purposes, subject to the following requirements:

1. **If materials, insights, facts, data or other information from Our Research is used, Our Research must be cited as the source and it must be stated Our Research is produced by Backend Benchmarking.**
2. **To avoid misrepresentation, the name or time period of Our Research cited must be stated. For example, if the information used is performance from the First Quarter 2018 the *Robo Report*, it must be clearly stated that the performance is from the first quarter report, or performance numbers are from the time period ending 03/31/2018.**
3. **The Company does not permit the redistribution of Our Research. We welcome and encourage including a link to our Website in any articles or other materials. We provide the report for free to anyone who wants to subscribe. Attaching, hosting for download, or including a link that allows a user to directly access Our Research is prohibited. The appropriate link for our Website to use is: https://www.backendbenchmarking.com/the-robo-report/**
4. **One must use the most recent version of Our Research at the time of publishing. The most recent version of Our Research and the date it was published are on https://www.backendbenchmarking.com/the-robo-report/. The newest version can be obtained by filling out the subscription form on the Website or by contacting the Company directly.**

Failure to comply with the aforementioned guidelines may result in a takedown notice, revocation of your subscription to Our Research, and/or legal action.

To request written consent or a license, contact The Company at info@backendb.com or call 732-893-8290 and ask for David Goldstone.

Disclaimer of Warranties:

Our Research is provided "as is"; with all faults. The Company disclaims all warranties of any kind regarding the Research, either express or implied, including but not limited to, any implied warranty of merchantability, fitness for a particular purpose, ownership, noninfringement, accuracy of informational content, and absence of viruses and damaging or disabling code.

The Company does not warrant the accuracy, completeness, or timeliness of the Research. The Company shall not be responsible for investment decisions, damages, or other losses resulting from use of Our Research.

Past performance does not guarantee future performance. The Company shall not be considered an "expert" under the Securities Act of 1933. The Company does not warrant that this service complies with the requirements of the FINRA or any similar organization or with the securities laws of any jurisdiction."

Some jurisdictions do not allow the exclusion or limitation of implied warranties, so the above exclusions or limitations may not apply.

Disclosures

1 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.

2 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.

3 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.

4 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.

5 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.

6 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.

7 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.

8 These accounts have no minimum required to establish an account. There is 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. These fees would decrease the reflected performance.

9 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 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.

10 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.

11 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.

12 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.

13 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.

14 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.

15 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.

16 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.

17 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.

18 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.

20 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.

21 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. Fee was waived for the first year. Had a fee been levied, reflected performance would have been lower.

22 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.

23 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. Fee was waived for an initial promotional period. Had a fee been levied, reflected performance would have been lower.

24 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 (0.5-1.5%), part of which it remits to the portfolio managers supplying the data underlying those strategies.

25 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.

26 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.

27 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.

28 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. 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.

29 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.

30 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.

31 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.

32 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.

33 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.

34 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.

35 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 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. Total portfolio performance is unaffected by holding balanced funds.

36 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.

37 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."

38 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.

39 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.

40 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.

41 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.

42 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.

A 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.

B 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 of equity allocation between the accounts on 12/31/2017 was approximately 5.4%.

C 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 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

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 under common ownership and control with Condor Capital Management, an SEC registered investment adviser. A copy of Condor's disclosure Brochure is available at 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 06/30/2021 the total size of the position was 32,987 shares of Schwab common stock, 17,719 shares of JP Morgan Chase common stock, and 5,395 shares of Goldman Sachs common stock. As of 03/31/2021 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, US Bancorp, Ally Financial, Charles Schwab, and Capital One.

For more information, please contact BackendBenchmarking at Info@BackendB.com

Connect with us at: www.facebook.com/TheRoboReport
www.linkedin.com/company/TheRoboReport
www.twitter.com/TheRoboReport