BRINGING TRANSPARENCY TO ROBO INVESTING

EDITION 24

The Robo Report® Second Quarter 2022

We are proud to publish the 24th edition of the *Robo Report®*, covering the second quarter of 2022, and the ninth 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:

- *The first two quarters of the year rewarded those portfolios with assets allocated to the theme of rising inflation and those portfolios with reduced exposure to interest rates. (pg. 15)*
- *In general, robo advisors with a higher allocation to value stocks outperformed year-to-date, while those with a higher allocation of growth stocks performed better over long periods. (pg. 16)*
- *We estimate the robo advice industry to have a combined AUM $988 billion, growing at a pace of 26% year-over-year. (pg. 21)*
- *Looking forward, direct indexing appears to be the next wave of innovation for retail investors. (pg. 19)*
- *The ability of live planners to deliver a comprehensive, holistic financial plan, low costs, and strong portfolio performance have driven SoFi to the top of our Robo Ranking. (pg. 6)*
- *The premier examples of online digital planning tools come from the three winners for Best Robo for Digital Financial Planning: Personal Capital, Wealthfront, and Schwab Intelligent Portfolios Premium. (pg. 10)*
- *High cash allocations at Intelligent Portfolios dampened losses year-to-date, erasing years of performance cash drag during the rising markets of the past seven years (pg. 23)*

Table of Contents

Executive Summary 3

Robo Ranking 4

- *Introduction* 4
- *Robo Ranking Scores* 5
- *Award Winners* 6

Top Performers 14

Performance Commentary 15

Total Portfolio Performance Chart 18

Industry Trends and Outlook: A Year in Review 19

Special Report: The Unseen Cost of Free Advice at Schwab 23

Costs, Performance, and Sustainability of SRI Portfolios 25

Terms of Use and Disclosures 27

All supporting data can be found online at theroboreport.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 58 accounts at 33 different providers. The *Robo Report* continues to evolve, and this quarter we bring you our usual data, which can be found online at www.theroboreport.com/data/, as well the *Robo Ranking,* performance commentary, an update to study on the cost of Schwab's high-cash allocations, and a short piece on the SRI portfolios we track.

SoFi and Wealthfront have topped our ranking for Best Overall Robo this year. Full details and scores for our ranking can be found in the *Robo Ranking* section of this report.

One note for this quarter's report regarding the Wealthfront account we track. The account we have tracked and published historically was originally invested in 2016. This account has held a dedicated allocation to an energy holding since its inception. According to portfolio allocations posted on the Wealthfront website, new accounts opened at Wealthfront do not have this "natural resources" allocation. It appears that our main account is in a legacy portfolio model. We also track an account that was opened and invested in 2018. This account's allocation appears closer to the current models offered at Wealthfront. Starting this quarter, we will publish the performance of both of the accounts we track and label them by the years in which they were first invested. The *Robo Ranking* scores the performance of our account as part of the ranking metrics. The ranking score is based on our legacy 2016 account to be consistent with prior rankings.

This year we updated our study on the cost of the high-cash allocation in our Schwab Intelligent Portfolios account following the recently released details surrounding the related SEC fine. Interestingly, our estimates of the performance lost due to cash drag are almost exactly the same performance drag as a 0.30% management fee over the 7-year period our account has been open.

Volatility in markets continued throughout the second quarter of this year. Those portfolios with allocations to commodities, energy, and REITs have been the most resilient through the first two quarters. Allocations to value and growth styles of investing have also been drivers of both the short- and long-term performance of portfolios. Those with tilts toward value investing have performed better year-to-date, while those with market-neutral or slight tilts towards growth have generally outperformed over the 3- and 5-year periods.

Direct indexing is finally coming to the retail investing space as one of the next significant innovations we see beyond robos. Meanwhile, the robo advice industry has matured and consolidated. Robo advisors will have a lasting impact on the investing landscape, but it is a story more about adoption by incumbents and democratization of services than that of disruption.

The Robo Ranking®

Bringing Transparency to Robo Investing

We are excited to publish the 9th 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 the *Robo Report*. 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 the *Robo Report*, our goal is to bring transparency to the digital advice industry to empower investors to seek the best products and services.

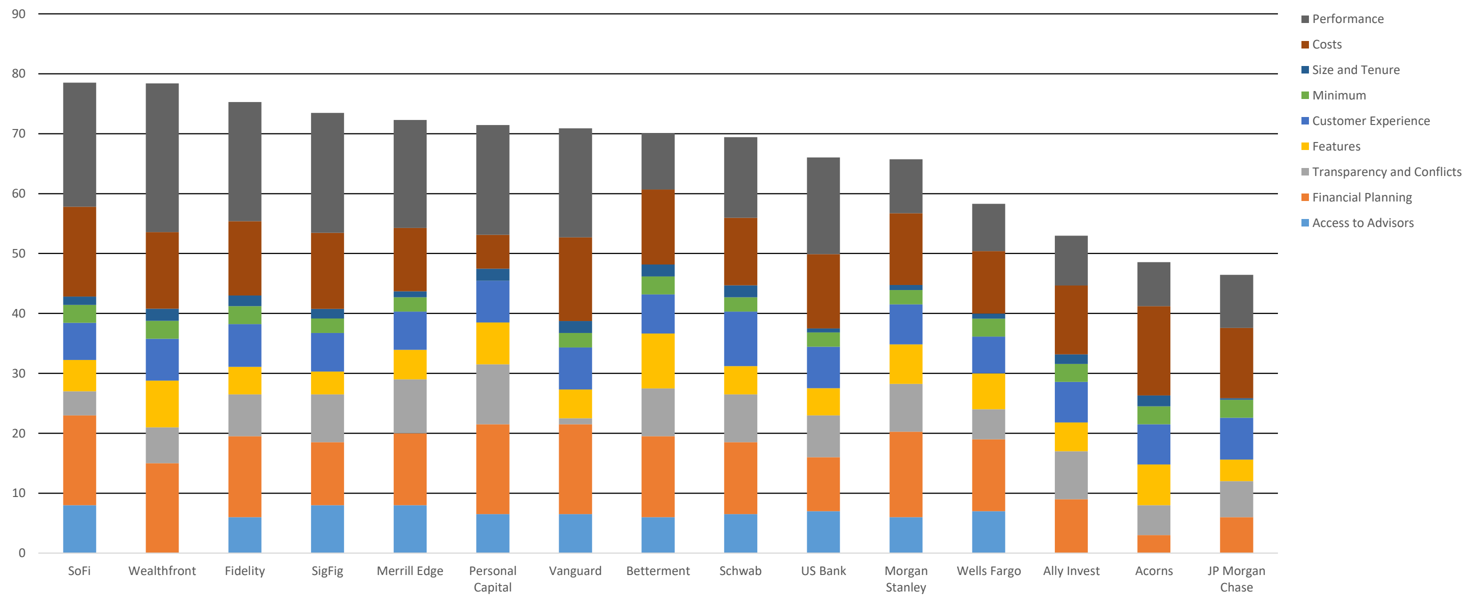
Introduction

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 the *Robo Report's* innovative method to compare globally diversified portfolios called Normalized Benchmarking. A methodology of Normalized Benchmarking can be found on our website. The details of how we created the scores and Ranking can also be found on our website.

Robo Ranking Scores



Robo Name	Access to Advisors	Financial Planning	Transparency and Conflicts	Features	Customer Experience	Minimum	Size and Tenure	Costs	Performance	Total
SoFi	8	15	4	5.24	6.18	3	1.4	15	20.7	78.53
Wealthfront	0	15	6	7.8	6.98	3	2	12.81	24.79	78.38
Fidelity	6	13.5	7	4.6	7.11	3	1.8	12.39	19.88	75.28
SigFig	8	10.5	8	3.8	6.45	2.4	1.6	12.7	20.02	73.47
Merrill Edge	8	12	9	4.92	6.38	2.4	1	10.58	18	72.28
Personal Capital	6.5	15	10	7	6.96	0	2	5.67	18.3	71.42
Vanguard	6.5	15	1	4.8	7.03	2.4	2	13.96	18.22	70.91
Betterment	6	13.5	8	9.16	6.51	3	2	12.5	9.38	70.05
Schwab	6.5	12	8	4.7	9.1	2.4	2	11.27	13.46	69.43
US Bank	7	9	7	4.52	6.92	2.4	0.67	12.39	16.12	66.02
Morgan Stanley	6	14.25	8	6.6	6.66	2.4	0.83	11.98	9	65.73
Wells Fargo	7	12	5	6	6.13	3	0.83	10.43	7.9	58.29
Ally Invest	0	9	8	4.8	6.78	3	1.6	11.47	8.31	52.96
Acorns	0	3	5	6.8	6.7	3	1.8	14.9	7.35	48.54
JP Morgan Chase	0	6	6	3.6	7	3	0.25	11.73	8.85	46.43
MAX	10	15	10	10	10	3	2	15	25	100

Produced by The Robo Report

Best Robo Advisors

- *The ability of live planners to deliver a comprehensive, holistic financial plan, low costs, and strong portfolio performance have driven SoFi to the top of our Robo Ranking.*
- *Best Overall Winner Runner-up, Wealthfront, has had a strong platform and has been a leader in innovation since its founding over a decade ago.*
- *Best Robo for First-Time Investors, Betterment, balances easy-to-use planning features while still having the ability to complete high-quality goals-based plans.*
- *The premier examples of online digital planning tools come from the three winners for Best Robo for Digital Financial Planning: Personal Capital, Wealthfront, and Schwab Intelligent Portfolios Premium.*
- *Vanguard Personal Advisor Services championed the "hybrid" advice model and remains our top choice for those with complex planning needs.*

Best Overall Robo Advisor

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

SoFi has won our top spot for Best Overall Robo Advisor again in this edition of the *Robo Ranking*. SoFi has greatly expanded the types of financial products it offers over the past few years as it ambitiously looks to compete with national banks for retail investing and banking business.

While this ranking focuses on the investing products SoFi offers, it is worth noting the depth of the platform as a whole. On the SoFi platform, individuals can find bank accounts, credit cards, mortgages, insurance, self-directed investing, crypto, and of course, their original business line of student loan refinancing. The checking accounts are free, the savings accounts offer high interest rates, the credit cards offer 2% cash back, self-directed trading is commission free, and the Auto-Invest robo product has no management fee. While this line-up of low- to no-cost products is compelling, it is important to note that SoFi has grown with significant venture capital investment, and growth has likely been a priority over profitability. We mention this because as the company matures and the focus shifts towards profits, we will not be surprised if SoFi starts to introduce more fees for some of its products.

On the SoFi platform, individuals can find bank accounts, credit cards, mortgages, insurance, self-directed investing, crypto, and of course, their original business line of student loan refinancing.

All SoFi members get free access to live financial planning services, which is one reason we like the investing platform. SoFi receives a high score in financial planning due to the quality financial plan a user can receive through the live planning option. We note that those looking for a top-of-class digital planning experience should consider our best Robo for Digital Financial Planning winners, as SoFi planning is primarily through sessions with live planners. SoFi does offer a strong budgeting tool as well as career coaching for those interested. The ability of live planners to deliver a comprehensive, holistic financial plan, low costs, and strong portfolio performance have driven SoFi to the top of our ranking yet again this summer. More information on performance can be found in the section for the Performance at a Low Cost Award.

Wealthfront has won the runner-up this quarter for the Best Overall Robo Advisor. Wealthfront is one of the pioneers in the industry and was one of the few remaining independent robo advisors until it was recently acquired by UBS. Wealthfront has had a strong platform which has been a leader in innovation since its founding over a decade ago. Wealthfront is also one of the only platforms that has stuck to its original digital-only offering. While you can now call in and receive operational support from a small team at Wealthfront, Wealthfront's intention is to make its online experience strong enough to eliminate the need for live advisors. Wealthfront's digital experience is top tier and strikes an impressive balance between simplicity, functionality, and customization. The online digital planning experience is rivaled by only a few other products on the market. Wealthfront offers a version of direct indexing, has introduced innovative customization options, and now offers ESG-themed portfolios. Wealthfront was also a pioneer in bringing automated tax-loss harvesting into the hands of any retail investor. Along with Betterment, Wealthfront sets the benchmark for low fees at 0.25%. We look forward to future innovations from Wealthfront; specifically, we hope to see Wealthfront continue to evolve its Self-Driving Money feature to bring further automation to budgeting, saving, and other areas of the retail investor's financial life.

Wealthfront is also one of the only platforms that has stuck to its original digital-only offering.

Wealthfront's all-around score in this version of the *Ranking* is in large part due to the performance of our account since the start of the year. While we cover this outperformance in other areas of the *Report* in more detail, investors should note one key facet of our model. The portfolio was first invested in 2016 and has long held a dedicated allocation to an energy-focused ETF. Since our first investment, models at Wealthfront have been updated to no longer include this allocation to energy, but likely due to tax considerations, our portfolio continued to hold energy. Those following the markets know that energy has been one of the few areas with positive returns in the market this year. Not all investors may have experienced the fantastic outperformance by Wealthfront that we did.

Best Robo for Performance at a Low Cost

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

The Best Robo for Performance at a Low-Cost category is designed to reward those investors that seek the best bottom-line quantitative metrics, specifically, returns and fees. For the three-year period ending June 30, 2022, a period that contained about two and a half years of falling interest rates and about half of a year in terms of rising rates, our Wealthfront portfolio was the top performer while SoFi earned a compelling second place finish, albeit for very different reasons. Whereas SoFi benefitted from allocations to growth equities, Wealthfront's notable investments in the energy sector proved valuable during recent inflationary times. During the 3-year trailing period ending June 30, 2022, the Russell 3000 Growth index outperformed the Russell 3000 Value index by about 5% per year on average. Meanwhile, for the trailing two quarters,

SoFi benefitted from allocations to growth equities, Wealthfront's notable investments in the energy sector proved valuable during recent inflationary times.

the energy sector outperformed the S&P 500 by about 50% as energy stocks were up about 30% while the S&P 500 was down 20%. Investors in Wealthfront's style of portfolio benefitted tremendously this year from having assets dedicated to hedging inflation while SoFi investors benefited from strong returns from growth stocks in the previously low-inflation period.

Both portfolios minimized the allocations to the parts of the market that detracted from performance, namely international stocks and small-cap stocks, at a time when these assets underperformed significantly. On the fixed income side of the portfolio, our Wealthfront and SoFi portfolios were allocated to municipals over Treasury bonds and over corporate bonds which further supported performance.

	Performance vs. Benchmark	Total Cost	% Equities in U.S.	% Bonds in Municipals
Wealthfront	1.58%	0.31%	70%	96%
SoFi	0.24%	0.04%	70%	64%
Robo Ranking Average	*-0.23%*	*0.35%*	*65%*	*43%*

Total cost is the sum of the weighted-average expense ratio and the management fee.

From a fee perspective, Wealthfront's average expense ratio was about 0.06% while SoFi boasted a low cost of just 0.04% in fees, compared to the average of about 0.08%. Furthermore, Wealthfront's management fee of 0.25% places it slightly below the *Ranking* average of 0.28%, while SoFi's free-to-use automated investment service is the lowest cost possible. Studies have shown consistently that high fees are a large detractor to long-term performance and savvy investors should take their selected robo advisor's total costs into account, especially if investing for decades.

Best Robo for First-Time Investors

- **Winner: Betterment**
- **Runner up: SoFi**
- **Honorable Mention: Fidelity Go**

Betterment is one of the longest-standing robo advisors and one of the few that remains independent. Building from the ground up has helped Betterment achieve an easy, intuitive interface with a friendly feel, making it a great home for those new to investing. Digital planning at Betterment is a quality experience. Betterment balances easy-to-use planning features while still having the ability to complete quality goal-based plans. Each goal allows the user to model different inputs, whether deposits, time horizon, or various scenarios for the retirement plan. The ability to model hypothetical changes to a user's financial model can serve as an effective education tool, making it particularly attractive for a new investor. Users can bring in outside accounts for holistic planning and track progress on multiple independent goals on a single dashboard.

> *Building from the ground up has helped Betterment achieve an easy, intuitive interface with a friendly feel making it a great home for those new to investing.*

For those who want more than a basic indexed portfolio, Betterment has added multiple thematic portfolios over the years. It now offers three ESG-themed portfolios, social, climate, and broad impact. The investing public, particularly younger generations, are increasingly interested in SRI investing.

Betterment is also a great choice for first-time investors as the platform can grow with the client as their situation grows in complexity. Betterment Premium offers unlimited access to CFP-credentialed planners for a modest increase in price. While many first-time investors may not want continual access to a CFP planner, especially if they are young and still in the early phases of accumulation, they may want some help from live planners to get them started. Betterment offers a-la-carte packages of sessions with live planners without needing to sign up for a higher service tier.

All around, Betterment's platform delivers the necessary complexity to provide quality investing and planning served within an easy-to-use interface to help first-time investors dive into investing and long-term planning.

SoFi is another great option for first-time investors. One reality for many young Americans is the investing journey really starts on a path to paying down student loans or other debt. SoFi is a platform where a student borrower can explore options to consolidate debt as a first step and work their way towards saving for long-term goals over time. SoFi has other features that are also tailored to those earlier in their investing career. SoFi not only offers access to live financial planners but also to career coaches. Young investors can benefit greatly from maximizing and growing their human capital at early stages in their lives. SoFi Relay is also a quality budgeting tool, allowing outside accounts to be tracked and helping investors with smart budgeting. The ability to manage many areas of one's financial life on this single platform, budgeting, career coaching, live planning, and low fees combine to make SoFi a great option for first-time investors.

SoFi not only offers access to live financial planners but also to career coaches.

We award Fidelity Go with the Honorable Mention for Best Robo Advisor for a First-Time Investor thanks to exceptionally low costs, an evolving and accessible digital platform, and strong long-term returns. When looking at the costs of Fidelity Go, an investor will find no-cost underlying Fidelity Flex funds. Furthermore, from a management fee perspective, the first $10,000 is managed for free, making it especially attractive for those with small sums to get started. When looking at the portfolio itself, it boasts top quartile long-term performance thanks to a simple and elegant portfolio that tilts towards large-cap U.S. stocks, which have performed well on a relative basis. Finally, when looking at the digital platform itself, Fidelity has a mobile app called Spire, which is geared toward the millennial generation. It contains quick-read articles on topics like wedding planning and retirement while also allowing the user to easily monitor their accounts with various financial goals all in one place. The team at Fidelity continues to innovate its digital platform while offering a low-cost competitive product making it a great choice for first-time investors.

Best Robo for Digital Financial Planning

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

The democratization of professionally managed portfolios is the most significant impact robo advisors have had on the financial advice industry. Not only have robos democratized managed accounts and access to advice, but they have also brought high-quality financial plans to anyone with an internet connection and willingness to spend some time building a plan. The winners in this category are the best-in-class digital planners on the market. And to top it off,

Not only have robos democratized managed accounts and access to advice, but they have also brought high-quality financial plans to anyone with an internet connection.

Personal Capital and Wealthfront make their digital plans available to anyone without needing to open an investment account.

The premier examples of online digital planning tools come from the three winners for Best Robo for Digital Financial Planning: Personal Capital, Wealthfront, and Schwab Intelligent Portfolios Premium. One area where these tools stand out is they not only can bring in data on outside accounts, but they can combine multiple goals into a single, holistic financial plan. The capability to build in future events, such as Social Security, pension or other retirement income, windfalls, and other custom inputs, aids in their ability to plan effectively. The three winners take these tools and present them in a digestible, easy-to-use manner. Personal Capital and Wealthfront include these robust planning tools in the standard, free-to-use versions of their services.

Personal Capital had among the most wide-ranging financial planning tools measured in our rankings. The robo advisor offers a variety of in-depth tools to aid in planning for retirement, savings, home purchase, education, and other goals. The retirement planner allows you to set up several spending goals alongside future income events and calculates a probability showing how likely you are to succeed in these goals. The retirement fee analyzer looks into your account's holdings to identify what portion of your investments may be lost to expense ratios. Further, the planner gives you the power to map out your current savings, an emergency fund, and allows you to plan to pay down debt. The Investment Checkup feature goes in-depth to explain to you how and why you should be rebalancing your portfolio for the most optimal outcome, taking into account risk tolerance, age, and portfolio composition, including the ability to analyze positions held elsewhere. Another nice feature offered is a consolidated display of your net worth, monthly cash flows, and other useful views of your finances in a single dashboard. Additionally, Personal Capital has a retirement asset deaccumulation tool called Smart Withdrawal to help design a plan to draw down assets during retirement in a tax-efficient way.

The wide array of tools, an integrated multi-goal plan, the ability to customize inputs specific to the investor, and Smart Withdrawal combine to make Personal Capital our top Robo Advisor for Digital Financial Planning.

Wealthfront launched as, and continues to be, a digital-first product with the goal of eliminating the need for human advisors and higher fees that typically come with them. Its digital planning tools go a long way in accomplishing this goal. The tool has specific modules for retirement, education savings, and taking time off to travel, as well as a home buying module that uses data from real estate tech firm Redfin. The planning module itself is not only built with a simple and easy-to-use interface, but also has a wide variety of input settings, allowing users to drill down and build complex plans. Retirement income, Social Security, real estate, windfalls, and other details can be modified within the planner.

> *Personal Capital has a retirement asset deaccumulation tool called Smart Withdrawal to help design a plan to draw down assets during retirement in a tax-efficient way.*

Another feature we like with Wealthfront is Self-Driving Money. Self-Driving Money is a set of automated or semi-automated features to help investors sweep and invest excess cash held in their bank accounts. This is designed to help users integrate their long-term goals with their month-to-month saving and spending habits.

Wealthfront's planner is the epitome of innovation across the robo advisor universe.

Schwab Intelligent Portfolios at the Premium service level is another compelling planning option for robo investors. The financial plan can be built collaboratively with a CFP credentialed live planner alongside a built-in integration with MoneyGuidePro, an institutional-quality suite of planning tools. Similar to other winners, Schwab both has the ability to model different goals and integrate them into a single holistic plan. The tool also has the ability to model different types of income, life events, scenarios, and other areas to allow for a higher level of customization.

Schwab also goes above and beyond most other planners with its Schwab Intelligent Income tool. Intelligent Income is a specific module that helps users model spending during retirement. It has automated withdrawal features to help investors spend down assets in a tax-efficient way. It also can generate a monthly 'paycheck.' Most people spend their adult lives learning to budget based on regular paychecks. By replicating the monthly cash flows of paychecks, Schwab helps ease the transition from working to drawing down your nest egg. Schwab Intelligent Portfolios Premium is one of the best planning experiences available in the robo-advice universe.

Best Robo for Complex Financial Planning

- **Winner: Vanguard Personal Advisor Services**
- **Runner-up: Personal Capital**

While some of the digital planning tools on the market have enough features to model many complex situations, we believe those with complex planning needs can still benefit from live planners. Vanguard Personal Advisor Services championed the "hybrid" advice model and remains our top choice for those with complex planning needs. While Personal Advisor Services still leaves something to be desired on the digital interface, it provides tremendous value as it costs just 0.30% in management fees. With a minimum investment of $50,000, users can work with a live advisor to model multiple financial goals. Also, investors can view a comprehensive illustration of their assets for a full picture. When we consider that traditional financial advice relationships 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.

While some of the digital planning tools on the market have enough features to model many complex situations, we believe those with complex planning needs can still benefit from live planners.

The Runner-Up for Complex Financial Planning provides a combination of live planning with one of the best digital planners on the market. Personal Capital is one of the more expensive options available, priced starting at 0.89%, and it carries a high minimum of $100,000. On top of its stellar online planning, budget, and asset tracking tools, Personal Capital stands out in a few other ways. Personal Capital offers a few investment options, including an SRI option and direct indexing. Additionally, for those with more than $1,000,000 under management, there are custom allocation options, including private equity and other alternative investments.

On top of the comprehensive retirement planning features, Personal Capital offers a feature called Smart Withdrawal. This tool simplifies what can be the complex process of determining where to withdraw retirement spending funds to do so in the most tax-efficient manner. This feature can not only help determine tax-efficient withdrawals, but it will suggest whether Roth conversions or tax gain harvesting should be considered. While Personal Capital is priced higher than most other products we cover, it represents a next-generation combination of technology and live advisors.

Robo Ranking Facts (Results as of 6/30/2022)

	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]	3.34%	-1.09%	0.25	No minimum	$3/month for Personal; $5/month for Family	0.04%
Ally Invest[9]	3.28%	-0.93%	0.26	$100	0.30% annually; Also offers 'cash-enhanced' portfolio with 30% invested in cash and no management fee	0.06%
Betterment[27]	3.74%	-0.80%	0.27	Digital: No minimum; Premium: $100,000	Digital: 0.25%; Premium: 0.40%	0.09%
Fidelity[33]	4.46%	0.19%	0.34	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%
JP Morgan Chase[7]	2.91%	-0.68%	0.25	$500	0.35% annually. JP Morgan ETF expenses will be rebated or offset against the management fee	0.11%
Merrill Edge[31]	4.41%	0.10%	0.32	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	0.06%
Morgan Stanley[12]	3.60%	-0.90%	0.27	$5,000	0.30% annually	0.07%
Personal Capital[4]	5.02%	-0.21%	0.35	$100,000	0.89% annually; discounted tiered pricing at higher asset levels	0.10%
Schwab[5]	3.79%	-0.15%	0.28	Intelligent Portfolios: $5,000; Intelligent Portfolios Premium: $25,000	Intelligent Portfolios: No fee (digital only); Intelligent Portfolios Premium: $300 initial planning fee, $30/month subscription	0.17%
SigFig[6]	4.64%	0.10%	0.35	$2,000	No fee for the first $10k; 0.25% annually for balance over $10k	0.06%
SoFi[17]	4.67%	0.24%	0.35	$1	No management fee	0.04%
US Bank[28]	4.05%	0.05%	0.3	$1,000	0.24% annually	0.11%
Vanguard[43]	4.38%	0.00%	0.33	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]	6.10%	1.58%	0.41	$500, some additional portfolio features require a higher minimum	0.25% annually	0.06%
Wells Fargo[14]	3.40%	-0.91%	0.25	$500	0.35% annually; discounted relationship pricing may be available	0.14%

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Returns are net of fees and from 06/30/2019 - 06/30/2022. The weighted average expense ratio calculations exclude cash holdings from the portfolio

Top Performers

Year-to-Date Top Performers

	Best	2nd	3rd
Total Portfolio	Wealthfront (Risk 4.0 ; 2016)	Morgan Stanley Inflation Conscious	Personal Capital
Equity	Wealthfront (Risk 4.0 ; 2016)	Interactive Advisors	Liftoff (Ritholtz Wealth Management)
Fixed Income	Zacks Advantage	Marcus Invest Smart Beta	Marcus Invest SRI

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1-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	Wealthfront (Risk 4.0 ; 2016)	Zacks Advantage	Morgan Stanley Inflation Conscious
Equity	Wealthfront (Risk 4.0 ; 2016)	Interactive Advisors	Marcus Invest Core IRA
Fixed Income	Zacks Advantage	Marcus Invest Smart Beta	Marcus Invest SRI

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3-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	Wealthfront (Risk 4.0 ; 2016)	Zacks Advantage	Schwab Domestic Focus
Equity	Wealthfront (Risk 4.0 ; 2016)	Zacks Advantage	Schwab Domestic Focus
Fixed Income	Schwab Domestic Focus	Schwab	Zacks Advantage

Produced by The Robo Report

5-Year Trailing Top Performers

	Best	2nd	3rd
Total Portfolio	Wealthfront (Risk 4.0 ; 2016)	Fidelity Go	SigFig
Equity	Wealthfront (Risk 4.0 ; 2016)	Fidelity Go	SoFi
Fixed Income	Schwab	SigFig	Axos Invest

Produced by The Robo Report

Total Portfolio winners are based on the portfolio's return vs. the Normalized Benchmark. Returns are net of fees and are as of 6/30/2022.

Performance Commentary

- *The first two quarters of the year rewarded those portfolios with assets allocated to the theme of rising inflation and those portfolios with reduced exposure to interest rates.*
- *Zacks continues to be a compelling option when looking at 3-year performance thanks to one of the most U.S.-centric equity portfolios.*
- *In general, robo advisors with a higher allocation to value stocks outperformed year-to-date, while those with a higher allocation of growth stocks performed better over long periods.*

Year-to-Date Performance

The first two quarters of 2022 have been tumultuous, to say the least. For investors implementing a traditional 60% stock and 40% bond allocation, this was one of the most challenging periods in recent history. The S&P 500 lost -19%, while the Bloomberg Barclays Agg was down -12%, resulting in the 60/40 allocation being down about -16% for the period. This was due to the rising interest rates as the 10-year U.S. Treasury Bond yield jumped from 1.51% to 3.02%. This move was driven by persistently high CPI prints. Inflation has become an issue for investors and consumers alike, resulting from fiscal stimulus being deployed in response to the pandemic, while supply chain shocks furthered the issue. Energy prices created turbulence too, as the Russia-Ukraine conflict pushed prices higher for oil, natural gas, and other commodities, albeit temporarily. Still, the first two quarters of 2022 were a period where investors could learn how their portfolios react from a rapid rise in inflation expectations.

The first two quarters of the year rewarded those portfolios with assets allocated to the theme of rising inflation and those portfolios with reduced exposure to interest rates. Some robo advisors proved to be particularly resilient, while others were quite vulnerable. It is important to keep in mind, however, that although risk can be especially detrimental for those investors nearing or in retirement, it can be beneficial to those who are dollar-cost-averaging into an accumulation portfolio. Investors in portfolios that were down this year need not panic if they have a considerable time left before withdrawing funds.

Some robo advisors proved to be particularly resilient, while others were quite vulnerable.

The top robo performers for the year-to-date period ending June 30, 2022, were our 2016 vintage Wealthfront portfolio, followed by the Morgan Stanley Inflation-Conscious-themed robo advisor, as well as our Personal Capital portfolio. When unpacking the drivers of returns, it was both the allocation to value stocks and specific inflation-protection-themed assets that were the stand-out contributors to relative performance. For example, it has been well documented in previous *Robo Reports* that Wealthfront's allocation to VDE, the Vanguard Energy ETF, as well as Morgan Stanley's allocations to PDBC and TPYP (a commodities and a pipeline ETF, respectively), have been stand-out contributors to these robo advisors' success. Meanwhile, our Personal Capital portfolio was allocated to gold and commodities, which boosted performance on a relative basis to traditional stocks and bonds. Although allocations to commodities, energy stocks, REITs, and precious metals were only about 10% of the assets of the winning portfolios, they made a big difference when investors needed it most in 2022. All three portfolios also had another important attribute: they favored value stocks and muted exposure to growth stocks.

	YTD Rank	% Energy ETFs
Wealthfront (2016)	1/58	9.1%
Morgan Stanley Inflation Conscious	2/58	4.1%
Personal Capital	3/58	2.1%

One headline investors noted this year was that it was one of the worst starts for fixed income in history. The top quartile of robo advisors in our large study group of over 50 accounts had an average duration of about 4.8, while the bottom quartile had a duration of 6.5. As interest rates rose, the shorter duration bonds proved to be more resilient. One surprising note is that Marcus Invest, Goldman Sachs' robo advisor, took the three of four top year-to-date fixed income performance spots across its standard option, its Socially Responsible Investing option, and its Smart Beta option, thanks to a combination of low-duration bonds and primarily allocating to municipal bonds. If investors anticipate the balance sheets of municipalities to continue to look healthy, this strategy may prove to be an attractive one, even if we enter a recession with a degree of interest rates rising in the backdrop.

One headline investors noted this year was that it was one of the worst starts for fixed income in history.

Long-Term Performance

The best robo advisors over a 3-year and 5-year period differed from those that performed the best in 2022, with one key exception: Wealthfront. In general, robo advisors with a higher allocation to value stocks outperformed year-to-date, while those with a higher allocation of growth stocks performed better over long periods. Wealthfront was able to outperform growth-oriented robo advisors in all periods thanks to a 10% allocation to energy, which has been exceptionally valuable as the conflict in Russia/Ukraine pushed prices much higher. Furthermore, our Wealthfront portfolio was allocated significantly to municipal bonds, which also held up particularly well during the year-to-date period ending June 30, 2022, compared to taxable issues.

When looking beyond our Wealthfront allocation, we also see other notable portfolios making a splash in the Robo Report top performers table. Zacks continues to be a compelling option when looking at 3-year performance thanks to one of the most U.S.-centric equity portfolios, boasting over 88% allocated to U.S. stocks. For reference, the Vanguard Total World Stock Market ETF (VT) is allocated to just 59% U.S. stocks. This active decision by Zacks has paid off for investors in recent years. As has been well-documented in previous reports, the cash drag from Schwab's robo portfolio is significant, as the robo allocates upwards of 10% cash in some portfolios. Still, the fixed income that is managed by Schwab has been outstanding and notably more complex than other portfolios. For example, our Schwab Domestic Focus bond portfolio holds municipal bonds, TIPs, high-yield corporate bonds, and emerging markets bonds. Although we have

Although we have complaints about the allocation to cash, we do admire the bond portfolio.

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Conclusion

One aspect of the investing landscape that 2022 brought particular attention to is investing during rising inflation, and as consequence, rising interest rates. When zooming into what was effective, it was using alternative asset classes like commodities as well as dedicated energy stocks that were the most impactful. However, these asset classes were not especially attractive over long periods of time. Therefore, when selecting a robo advisor it is important to consider one's own goals and objectives. If an investor is in the decumulation phase of their investment lifecycle, they may decide to add to robo advisors like Morgan Stanley's Inflation Conscious portfolio to help reduce risk in light of rising inflation. Alternatively, investing with Personal Capital could also provide some inflation protection through investing in commodities, precious metals, or energy stocks. Even though this may seem particularly attractive now, it is worth noting that we could move back to a world with declining inflation in the not too distant future, making robos like SoFi and Fidelity Go attractive from a growth perspective. The most prudent investment option may be to combine growth-oriented robos with those that have higher allocations to value stocks and inflationary assets.

	YTD Rank	% Energy ETFs	% Commodities ETFs	% Precious Metals ETFs	% REITs	Total Inflation-Related Assets
Wealthfront (2016)	1/58	9.1%	0.0%	0.0%	0.0%	9.1%
Morgan Stanley Inflation Conscious	2/58	4.1%	6.5%	0.0%	4.7%	15.3%
Personal Capital	3/58	2.1%	1.7%	2.9%	2.3%	9.0%

Total Portfolio Performance

Industry Trends and Outlook: A Year in Review

- ***We estimate the robo advice industry to have a combined AUM $988 billion, growing at a pace of 26% year-over-year.***
- ***Looking forward, direct indexing appears to be the next wave of innovation for retail investors.***
- ***There are not very many independent players left in the space in light of a steady pace of consolidation and closures.***
- ***Product struggles and closures underline the fact that clients with smaller sums to invest are both challenging to serve profitably and difficult to attract.***

Innovation: What is Next?

Robo advisors have modernized some aspects of portfolio management: automated tax-loss harvesting, seamless onboarding, interactive digital financial planning, and automated smart dividend reinvestment to keep portfolios closer to target weightings, are all great features found at many robo advisors. But these features have all been on the market for many years now.

Both Schwab and Fidelity launched direct-indexing products for retail clients recently.

Looking forward, direct indexing appears to be the next wave of innovation for retail investors. Direct indexing is the practice of replicating the underlying constituents of an index instead of buying an ETF or index mutual fund. Both Schwab and Fidelity launched direct-indexing products for retail clients recently. The list of firms that acquired direct indexing technology over the past few years is reminiscent of incumbent firms gobbling up nascent robo advice fintechs five to ten years ago. Vanguard, Blackrock, Goldman Sachs, Morgan Stanley, Schwab, JP Morgan, Franklin Templeton, and First Trust have all acquired firms with direct-indexing technology. While direct indexing is not new, nor new to some of these firms, historically, it has been primarily available only to high-net-worth individuals. Direct indexing with a smaller portfolio was made possible by fractional share investing. Fractional share investing, the practice of buying fractions of a single share of an ETF or company, also allowed robo advisors to invest as little as $1 in a globally diversified portfolio. Fractional shares opened the doors for direct indexing to become available to the masses.

Direct indexing is not new to robo advice, as Personal Capital and Wealthfront have offered a version of it for some years now. Trading platforms M1 and the early, but now shuttered, pioneer Motif developed trading methods that could be described as direct indexing. Even though these platforms have direct-indexing capabilities, now that the major incumbent firms have taken an interest, we believe the age of direct indexing for retail clients is just beginning.

This method of portfolio management has some exciting implementations. Specifically, as ESG (Environmental, Social, Governance) investing

> *This method of portfolio management has some exciting implementations.*

increasingly garners interest from investors, ESG-based screens can be applied through direct indexing, allowing for highly customized portfolios based on individual investor preferences. It also has the ability to greatly increase the opportunities for tax-loss harvesting. As with an index-tracking ETF, the entire ETF must have an unrealized loss in order to harvest it; in a direct-indexed version of the same portfolio, any one of the individual underlying positions can be harvested when it falls into loss territory. Customization for those with large holdings in their employer's stock may be interested in owning an index but excluding the company where they have an existing concentrated position. Meanwhile, JP Morgan and Vanguard have offerings for independent advisors who are interested in bringing this technology to clients.

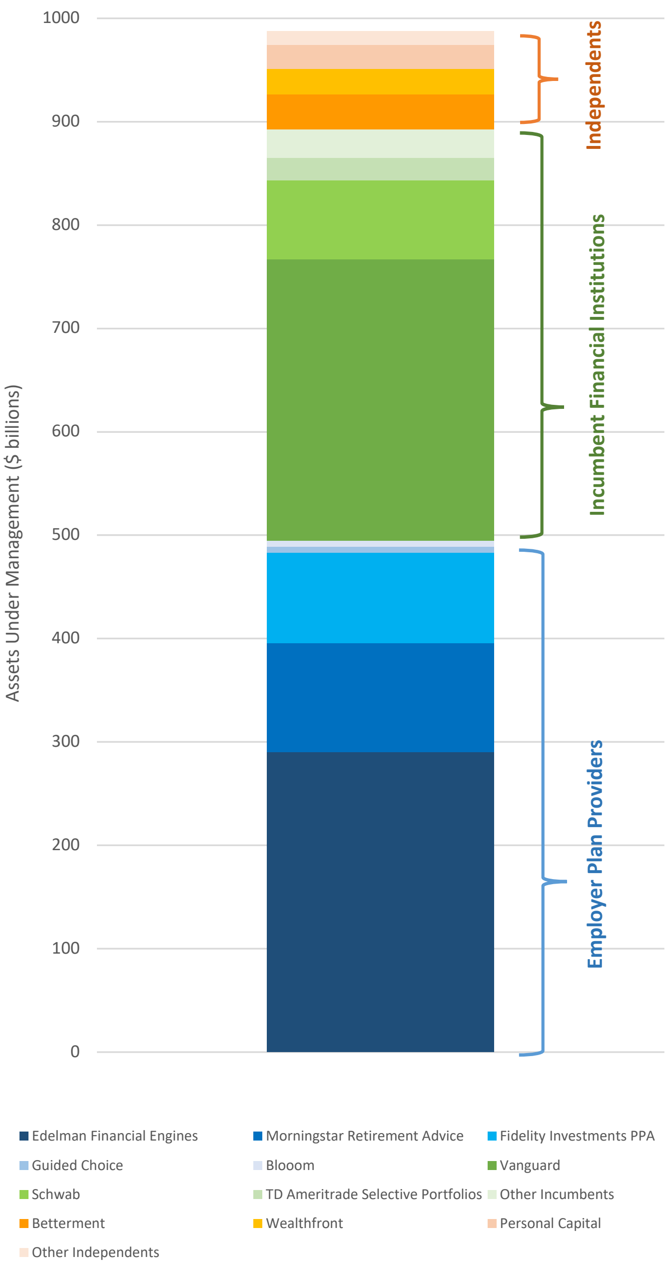
Maturity, Consolidation, and the Democratization of Financial Advice

Independent startups have always led innovation. The reality is there are not very many independent players left in the space in light of a steady pace of consolidation and closures. Late last year, Wealthfront was acquired by UBS, and in 2020, Personal Capital was acquired by Empower Retirement. These two acquisitions greatly slimmed the ranks of major independent players. Betterment remains independent, as do micro-investing apps Acorns and Stash. With venture backers likely looking to find an exit, remaining independents may be looking to public markets. SoFi, which offers a wide variety of fintech solutions, went public via SPAC in 2021. Acorns was also on the SPAC path but abandoned the deal prior to closing. Even Betterment has entered into a different corporate phase with founder and long-time CEO Jon Stein resigning.

The legacy of Jon Stein and other robo entrepreneurs, like Wealthfront's Andy Rachleff and Acorn's Jeff Cruttenden, is significant, as they changed the retail investing landscape. High minimums at traditional advisors made professionally managed portfolios out of reach for many individuals. Meanwhile, high fees made some investors question the value proposition of their traditional advisors. Furthermore, as robo advisors have sought to front-load benefits, there are now multiple free, high-quality digital planning tools available. Personal Capital, Wealthfront, and Schwab all offer quality planning tools without needing to enroll in a managed account program. Robos have truly democratized professional money management and financial planning for the masses.

> *The legacy of Jon Stein and other robo entrepreneurs, like Wealthfront's Andy Rachleff and Acorn's Jeff Cruttenden, is significant, as they changed the retail investing landscape.*

Traditional Advisors Remain Resilient to the Robo Threat



What robos have not done is taken the place of the traditional advisor. Average account sizes at Betterment are $49,000; at Wealthfront, $77,000; and at Acorns, as low as $1,400. Clients at these levels of wealth can still greatly benefit from planning and professional advice but are not typically attractive clients to traditional advisors who aim for those with assets of $500,000 or more. Traditional advice firms are generally not built to profitably serve clients with smaller amounts to invest. However, not all robo advisors have successfully solved this puzzle either.

Product struggles and closures underline the fact that clients with smaller sums to invest are both challenging to serve profitably and difficult to attract. John Hancock, BBVA, and Fifth-Third Bank all abandoned robo advice offerings in 2021. Meanwhile, UBS has struggled to find a winning robo advice strategy. First, UBS launched SmartWealth, a robo advisor based in Europe in 2016, but it later closed in 2018. That same year, UBS partnered with SigFig to launch its U.S. digital advice product, Advice Advantage. However, UBS recently bought Wealthfront, leaving the fate of Advice Advantage up in the air.

> *John Hancock, BBVA, and Fifth-Third Bank all abandoned robo advice offerings in 2021.*

Despite a difficult road for some, the industry has continued to grow through the end of 2021. In the first quarter of 2022, we estimate the robo advice industry to have a combined AUM $988 billion, growing at a pace of 26% year-over-year. Much of this estimate is from year-end numbers and the AUM picture is likely lower now due to the correction in both equity and bond markets in 2022. While juggernauts like Vanguard, Financial Engines, and Schwab continue to amass AUM, slowing growth may be an issue for some robo advice providers. After a surge in new accounts and clients in the wake of the pandemic, 2021 appeared to show slowing user growth, specifically amongst the two major micro-investing apps. For example, Acorns and Stash both appeared to have a significant slowdown in the number of clients added in 2021. In 2020, Acorns added nearly 1.4 million clients, growing at a rate of nearly 50% year-over-year. In 2021, they added just 267,000 new clients, representing just over 6% growth. Stash's growth in clients also plummeted from 58% in 2020 to just 12% in 2021.

Despite the industry facing hurdles as it matures, digital advice is now a permanent part of the advice landscape.

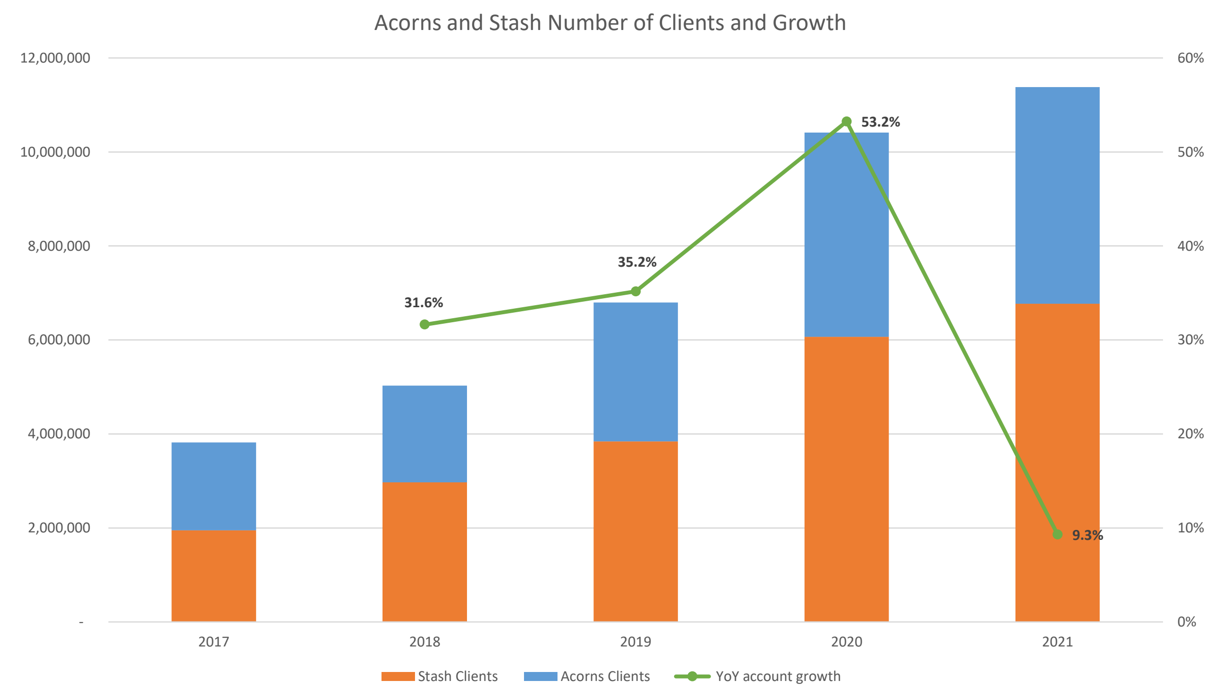
Like Traditional Advice, Robo Clients Tend to be Older

One other common misconception about robo advice is that it is only for young people. While one of the seismic shifts that robos will bring to the advice industry is that the advice relationship will start much earlier in the client lifecycle, many, if not most, robo clients are nearing or in retirement. In 2017, we talked to representatives from Merrill Lynch and Schwab. Merrill shared with us that 45% of their robo clients were over the age of 50, while Schwab told us more than half of their clients were in this age group. Around the same time it was reported that 85% of Vanguard's Personal Advisor Services clients were older than 50. Demographics of robo advice appear to trend towards those with less assets, first-time investors, and previously self-directed investors.

Demographics of robo advice appear to trend towards those with less assets, first-time investors, and previously self-directed investors.

Looking Ahead

As we look ahead into the remainder of 2022, we strive to continue to provide transparency into the robo advice industry. With robo advisors being a compelling option for those just starting out in the world of long-term planning and investing, many investors will have their first advice relationship experience at a robo advisor. We believe it is important to provide unbiased research into the industry and specific products. We look forward to doing so for years to come.



Special Report: The Unseen Cost of Free Advice at Schwab

- *High cash allocations at Intelligent Portfolios dampened losses year-to-date, erasing years of performance cash drag during the rising markets of the past seven years.*
- *As of the halfway point in 2022, the performance cost of the high-cash portfolio is equivalent to charging a 0.30% management fee since 2015.*
- *Schwab paid $187 million in charges related to disclosures around high allocations to cash.*

An Update to Performance of High-Cash Schwab Portfolios

In June of this year, details emerged regarding the SEC action related to Schwab's Intelligent Portfolios rob- advice product suite. Last year, we calculated how much we thought Schwab Intelligent Portfolios clients lost in missed performance due to the high cash allocations within the robo advisor's model portfolios.

The SEC found that, according to Schwab's own internal analysis, 'high allocations to cash would hinder portfolio performance in 'most market conditions.' So far this year, we are not experiencing 'most market conditions'. Due to the significant drop in both equity and fixed income markets, the cash has provided a buffer against losses this year. The dampening of losses in the portfolio erased years of performance drag during the rising markets of the past seven years.

We approximated that a fully invested portfolio would have outperformed the high-cash portfolio by just 2.9% over a 7-year period.

According to our estimates, if Schwab had invested the high levels of cash into the bond side of the portfolio, we approximated that a fully invested portfolio would have outperformed the high-cash portfolio by just 2.9% over a 7-year period. Meanwhile, if Schwab had charged a 0.30% management fee instead of a high-cash balance, the two portfolios would have performed almost exactly the same. As of the halfway point in 2022, the performance cost of the high-cash portfolio is equivalent to charging a 0.30% management fee since 2015. In fact, the high-cash portfolio is estimated to have outperformed the fully invested one with a management fee by 0.01% in total over seven years.

The SEC found that Schwab was allocating portfolios 'in a manner that, by their own internal analyses, showed would be less profitable for their clients under most market conditions.

While the high cash allocation is making performance fruitful this year, we maintain that this is a sub-optimal portfolio construction. In the long run, these high cash allocations will cost investors, which is a notion that appears to be something both the SEC and Schwab agree with.

The SEC found that Schwab was allocating portfolios 'in a manner that, by their own internal analyses, showed would be less profitable for their clients under most market conditions, especially in the aggregate.' More importantly to the SEC, Schwab was not properly disclosing this practice, and were misleading investors under the guise of 'optimal returns.'

Schwab paid $187 million in charges related to disclosures around these high allocations to cash. While Schwab has modified their disclosures, the high-cash balances remain. The digital-only version is still offered with a 'no-advisory fee' while it is disclosed in the FAQ section that Schwab generates profits from the cash holdings in investors' portfolios.

At this moment, the high cash allocation has provided enough downside protection to wipe out years of performance cash drag. Schwab could seize this opportunity to abandon this practice of holding clients' cash hostage as a replacement for a transparent management fee. This would be an optimal time to phase in a modest management fee in lieu of high-cash allocation. Schwab should consider giving clients the option to be fully invested and pay a fee.

Schwab could seize this opportunity to abandon this practice of holding clients' cash hostage as a replacement for a transparent management fee.

Costs, Performance, and Sustainability of SRI Portfolios

- *On average, the SRI portfolios allocated 3.00% more to growth.*
- *The average expense ratio among the SRI portfolios was 0.22%, compared to the standard portfolio average of 0.06%.*
- *SRI portfolios are paying almost four times more for only a mild reduction in sustainability risk.*

Methodology

To measure the performance of socially responsible investing (SRI) portfolios by robo advisors, we looked at 16 portfolios from five providers, including Betterment, E*Trade, Marcus, Merrill Lynch, Morgan Stanley, and TD Ameritrade. There was one standard robo portfolio and one SRI portfolio from each provider, except for Betterment, which now offers separate SRI portfolios targeted to be socially conscious, environmentally conscious, as well as a recently updated broad-impact portfolio. We tracked the portfolios' performance in the first half of the year, 2021's performance, as well as their Morningstar environmental, social, and corporate governance (ESG) risk scores; furthermore, to better understand the drivers of performance, we looked at the average expense ratios, the blend of growth and value, the average market capitalization, and the P/E ratios. We focused only on the equity returns of the portfolios, as these thematic portfolios typically only hold ESG-themed funds on the equity side of the portfolio. Generally, there are very few ESG-themed fixed income mutual funds or ETFs on the market.

Performance and Drivers

The equity portfolios of the standard options returned an average of -19.05% through the first two quarters of 2022. By contrast, the equity portfolios of the SRI options returned an average of -20.50% over the same period. When looking into the drivers of return, one major factor was the growth versus value split between the standard and SRI portfolios. On average, the SRI portfolios allocated 3.00% more to growth, whereas the standard portfolios were allocated 2.32% more to value. During the first half of the year, the Russell 3000 Growth Index underperformed the Russell 3000 Value Index by about 15%, which favored the standard options over those with SRI tilts. The best performing portfolio was the standard Betterment portfolio, which had an equity return of -17.75%. Betterment's standard portfolio holds specific value-oriented funds, and across the equities in the portfolio is weighted 30% to value. By contrast, the worst performing portfolio was the Morgan Stanley SRI portfolio, returning -22.30% while carrying the lowest

> *When looking into the drivers of return, one major factor was the growth versus value split between the standard and SRI portfolios.*

allocation to value in its portfolio at just 20%. Although at the *Robo Report*, we do not take a stance of whether an investor should tilt towards growth-oriented or value-oriented stocks, investors should understand that by choosing SRI options, they may be taking an unintentional bet on the growth segments of the market.

Robo Advisor Group	YTD Performance	2021 Performance	% Growth	% Value	P/E Ratio
SRI Portfolio	-20.50%	19.29%	34.00	24.11	15.45
Standard Portfolio	-19.05	18.82%	31.00	26.43	14.73

Sustainability Score

The Morningstar Sustainability Risk Scores range between 0 and 40+, with 0-9.99 representing negligible risk, 10-19.99 representing low risk, 20-29.99 representing moderate risk, 30-39.99 representing high risk, and 40+ representing a severe degree of risk. For this study, we took a weighted average of the Morningstar Scores.

While this 1.63-point difference does indicate that the SRI portfolios carry a lower degree of sustainability risk, both fall into the same low-to-medium risk category.

The standard robo portfolios had a weighted average sustainability score of 22.71, compared to an average sustainability score of 21.08 among its SRI counterparts. While this 1.63-point difference does indicate that the SRI portfolios carry a lower degree of sustainability risk, both fall into the same low-to-medium risk category. However, the fees are notably higher for the SRI options.

Robo Advisor Group	Expense Ratio	Portfolio Sustainability Score
SRI Portfolio	0.22%	21.08
Standard Portfolio	0.06%	22.71

While it is unclear how much environmental or other benefits SRI investors are promoting, it is clear that they are paying more. The average expense ratio among the SRI portfolios was 0.22%, compared to the standard portfolio average of 0.06%. While both options are generally inexpensive, investors who choose to open SRI portfolios are paying almost four times more for only a mild reduction in sustainability risk. As the industry continues to process the increasing investor demand for conscientious options, we hope for more significant differences to support those investors who are willing to pay up to do better for the world.

While it is unclear how much environmental or other benefits SRI investors are promoting, it is clear that they are paying more.

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Last updated: 9/30/2021

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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. Prior to the Axos and Wisebanyan acquisition and integration, this account was not charged a management fee. Had additional service packages, such as tax-loss harvesting, been added, the lesser of an asset-based fee or flat dollar fee would have been assessed. These fees would have decreased the reflected performance. Currently, this account is charged a 0.24% management fee. In August of 2021, there was a reporting issue with this provider. The issue has been resolved but the resolution effectively caused a rebalance of the account on 09/30/2021.

[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 of 2017, new accounts are charged a 0.30% management fee. The fee on our account was grandfathered in and remains at 0.25%. The higher advisory fee would have the result of decreasing reflected performance.

[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. "Essential Portfolios" does not appear to be available to new clients, likely due to the pending Schwab and TD Ameritrade integration. These accounts are grandfathered into the "Essential Portfolios" program and are charged a 0.30% annual asset-based management fee.

[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 The Robo Report 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. The 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. The 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 (0.08-1.5%), 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. The fee was waived for an initial promotional period. Had a fee been levied, reflected performance would have been lower. As of March 27, 2019, the management fee has been lowered. The lower advisory fee will increase reflected performance.

[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 may hold balanced funds. Due to the nature of these funds and limits in our portfolio management system, we cannot accurately track equity and fixed income performance individually at the portfolio level for portfolios with balanced fund holdings. Total portfolio performance is unaffected by holding balanced funds.

[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.

[43] This account was funded with the minimum or more than the minimum amount required to establish an account at the time of opening. Had the account been funded with more assets it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. On June 19th, 2017, Vanguard removed the Robo Report'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.

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

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

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

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

At certain custodians, a combination of the custodian providing us a limited number of digits on fractional share and fractional cent transactions rounding errors are introduced into our tracking. At quarter-end starting 3/31/2020, we implemented a process to enter small transactions to eliminate any rounding errors that have built up to more than a full cent. These transactions are small and do not have an appreciable effect on performance.. Sharpe ratios and Standard Deviation calculations are calculated with the assumption of 252 trading days in a year.

This report represents Digital Advice LLC'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. Digital Advice LLC is owned by Condor Capital Wealth Management, an SEC-registered investment adviser. A copy of Condor's Disclosure Brochure is available at www.condorcapital.com. 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 03/31/2022, the total size of the position was 37,929 shares of Schwab common stock, 22,769 shares of JP Morgan Chase common stock, and 5,636 shares of Goldman Sachs common stock. As of 03/31/2022 accounts discretionarily managed by Condor Capital Management held bonds issued by the following companies: Morgan Stanley, Bank of America, Goldman Sachs, Wells Fargo, E*Trade, Citi Group, JP Morgan Chase, Citizens Financial Group, Ally Financial, Charles Schwab, and Capital One.

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