




# BRINGING TRANSPARENCY TO ROBO INVESTING

## *Robo Report*<sup>™</sup>: First Quarter 2017



**W**e are proud to announce the publication of the third *Robo Report*<sup>™</sup>, covering the 1st Quarter 2017. This is a continuation of an ongoing study that monitors the most well-known robo advisors. We strive to provide a reliable resource for investors who are considering, or currently invest with digital and automated investment products. In light of the recent emergence of algorithm- and automation-backed investment solutions, we think it is important to understand what their characteristics are in order to provide transparency for investors. That is why we believe the proprietary *Robo Report*<sup>™</sup> is an innovative and go-to resource.

To really get a first-hand understanding about how the different providers operate and invest clients' money, we opened up, funded, and sought specific portfolios. For the taxable accounts, we sought a moderate allocation of approximately 60% stocks and 40% bonds for an investor in a high tax bracket. As for the IRAs, our goal was to have the most aggressive (highest stock) allocation. Starting with a similar baseline allocation across the portfolios allows us to measure performance and compare how our funds are invested as equally as possible on an ongoing basis. Alongside reporting performance on a quarterly basis, the *Robo Report*<sup>™</sup> will include a discussion on the trends we saw during the quarter that drove performance, highlighting portfolios that benefited or were disadvantaged by the trends. We also included a Robo News section highlighting news stories and announcements in the Robo Investing world.



## The Executive Summary

The performance of the taxable accounts varied considerably for the 1st quarter. The following table illustrates the best-performing equity only returns, fixed income only returns, and total portfolios.

The returns for the quarter ranged between 3.48% and 5.21% in our taxable accounts and 5.17% and 7.08% in our IRA accounts.

	Best	2nd	3rd
Equity	SigFig	TD Ameritrade	Vanguard
Fixed Income	Schwab	SigFig	TradeKing Momentum
Portfolio	SigFig	TradeKing Momentum	TD Ameritrade

We did not see any significant tax loss harvesting in the accounts in the 1st quarter of 2017. This can be expected as the account age lengthens in an up market and unrealized gains start to accumulate, making the opportunity of selling a fund at a loss less likely.

Once all was said and done, the relative out-performers in the 1st quarter among the taxable accounts were those that had higher allocations in international securities and low allocations in small cap securities. The bond portion of the portfolios was much more even keeled, but portfolios that held emerging market and corporate debt tended to fare better.



## Robo News

It has been a busy quarter in the Robo advising world, with news from Motif, TradeKing, Wells Fargo, Goldman Sachs, and Betterment. Motif announced the launch of three proprietary portfolios dubbed the “Impact Portfolios”. This new product is in addition to Motif’s unique offering where users create portfolios that can be “followed”. These new portfolios are managed at Motif’s discretion based on their risk assessment of users similar to other Robo Advisors. What sets them apart from most other offerings is they each have a socially responsible theme, allowing their clients to invest with a social purpose.

Following last year’s acquisition of TradeKing by Ally Financial, TradeKing has announced to their users a change in strategy. At the end of the 1st quarter, old accounts experienced a transition from their existing TradeKing Portfolio’s to the “Ally Invest Managed Portfolios”. This will represent the most significant change for those invested in

the TradeKing “Momentum” strategy and those portfolios with “Risk Assist” as they will transition from an active strategy employing technical analysis to what we anticipate will be a more passive strategy. Existing customers fee structure will not change, but new customers will pay a 0.30% fee as opposed to TradeKing’s previous 0.25% fee. Minimums for new accounts have stayed at \$500 but may increase to \$2,500. We also believe a rebranding from TradeKing to Ally Invest Advisors is on the near horizon.

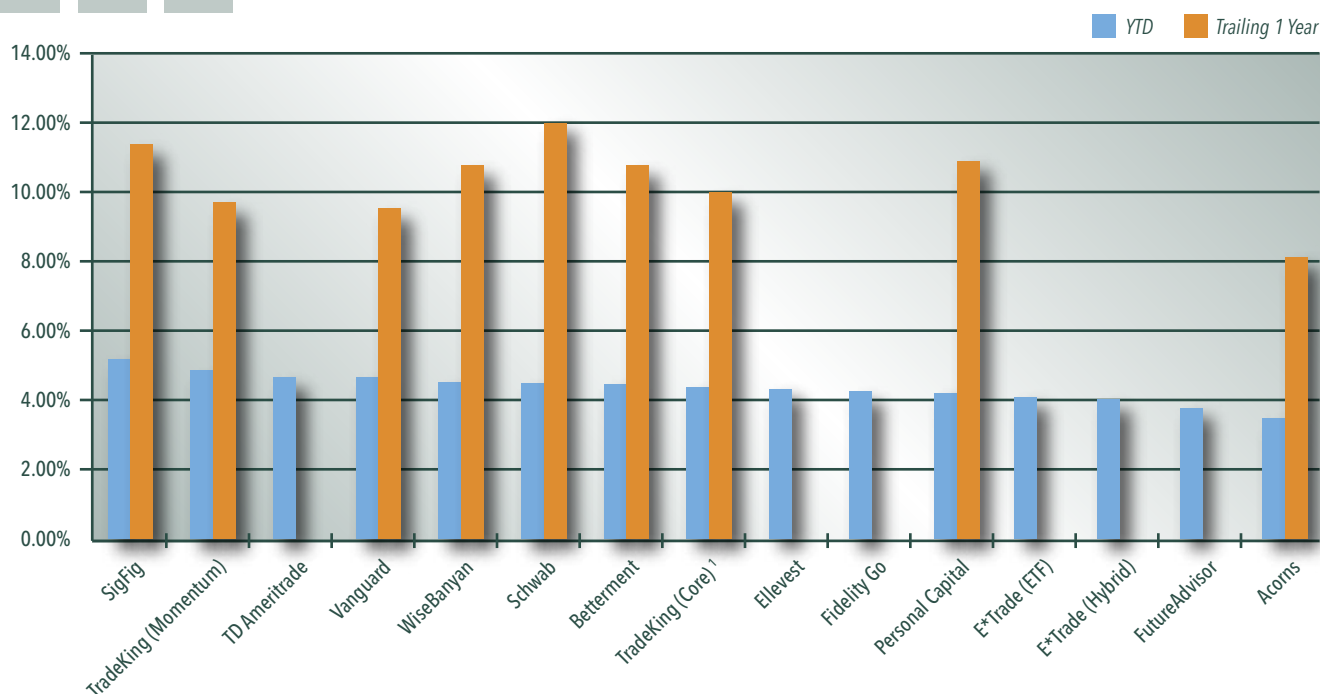
Betterment announced adding live advisors to its offering. The services including access to a live advisor will only be available to investors with \$100,000 or more invested with them. This is a continuation of a trend we see from “pure” Robos with little to no human advice, to a “hybrid” model where Robo tools are combined with more traditional person-to-person interaction.

Wells Fargo has announced details of its upcoming Robo offering. We anticipate the product will be named “Intuitive Investor” and will target younger investors with an account minimum of \$10,000 and charge a 0.50% management fee. The portfolio will be managed by SigFig, and asset selection will be handled by the Wells Fargo Investment Institute.

In addition to the Wells Fargo announcement, it is widely believed that Goldman Sachs is working

on a Robo Advice platform to help expand their offerings to attract mass affluent investors. We also hope to see an offering from Morgan Stanley later this year, although it is unclear whether their digital advice tools will be used to augment their existing advisor’s businesses, be marketed directly to consumers, or both. Jamie Dimon also said in his yearly letter to shareholders that JPMorgan is developing a digital investment advice solution that should be ready this year.

## Performance Commentary



The 1st quarter of 2017 has been another very strong quarter for equities, while most fixed income showed slight gains despite rising interest rates. Many trends from last year, particularly last quarter, have seen a reversal. The big trends we saw that drove performance this quarter in our Robo portfolios as a whole were allocation decisions in equities, as most of our Robo’s bond portfolios gained between 1 and 2 percent. Drivers of equity performance in the Robo portfolios included allocations to international equities, particularly emerging markets, weightings away from value and towards growth, and an emphasis on large- or mid-cap equities over small-cap.

### International Leads the Way

Both developed and emerging markets outperformed their domestic counterparts since the beginning of the year. The Eurozone announced that it achieved 1.7% GDP growth in 2016, which marks the first time since 2008 that their GDP has grown faster than in the US. Eurozone jobless rates announced for December also reached a nearly 6 year low. This, combined with continued easy monetary policy in Japan and Europe, helped bolster returns in this sector. Emerging market funds experienced large inflows in the 1st quarter of the year. Concerns over the ability of the Trump

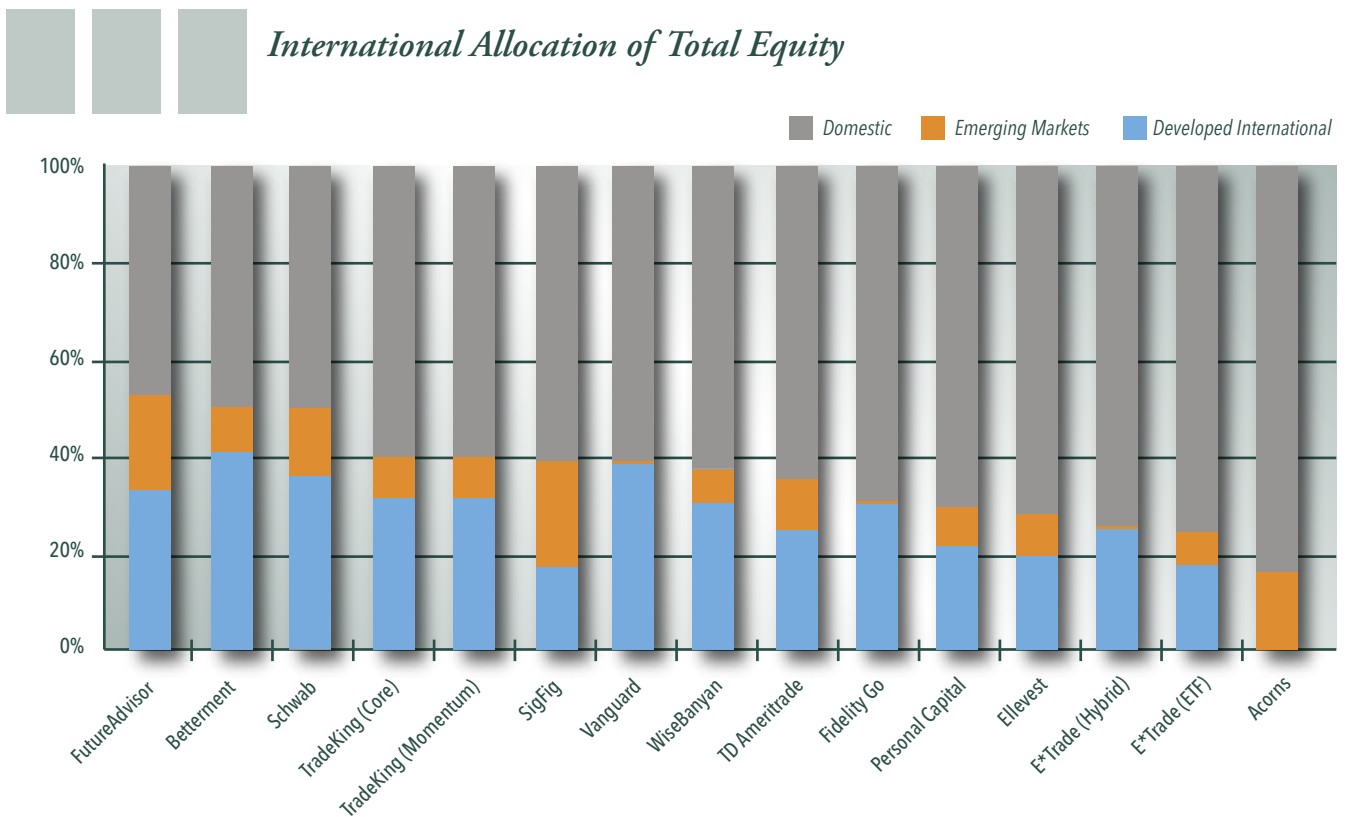
administration to effectively implement its agenda has both fueled concerns that the US market is overvalued if tax reform hopes fall short and eased concerns over anti-trade policies. US politics combined with a moderating dollar, decreasing concerns over China, positive political and reform news in India, as well as positive signs that Brazil and Russia may be emerging from their recessions have all fueled the run in emerging market equities.

FutureAdvisor, Betterment, and Schwab led the pack in international equity allocations, investing nearly half of their equity allocation in international equity funds at 53%, 50%, and 50%, respectively. Within the equity portion of the portfolio, they had emerging markets allocations of 20%, 9%, and 14% of their total equity position, respectively. The international equity allocation fell in the middle of the pack for the following Robos: TradeKing Core and Momentum, 40%; SigFig, 39%; WiseBanyan, 38%; Vanguard, 38%; TD Ameritrade, 36%; Fidelity Go, 31%; and Personal Capital, 30%. Ellevest and both eTrade portfolios had international equity allocations between 25% and 29%.

Acorns had the smallest international allocation at only 16% of their equities. Although a small allocation, all 16% of Acorns' allocation was to emerging markets, which outperformed developed international funds.

In our group of IRAs, the leaders in international allocation were SigFig, with a significant 55% allocation, followed by Betterment at 52% and Schwab at 47%. WiseBanyan, TradeKing Core, and TD Ameritrade were in the middle of the pack between 36%-40%. The remainder of the IRA portfolios — both eTrade strategies, Personal Capital, and Fidelity Go — all had international equity allocations between 25% and 30%. We also noted that international equities is one of the areas where the eTrade mutual fund strategy holds an actively managed fund over an ETF. The eTrade Hybrid Strategy holds the Harbour International Fund, while the ETF only strategy holds the Vanguard FTSE All World Ex-US Index ETF; interestingly, the Vanguard fund outperformed the Harbour fund this quarter.

### International Allocation of Total Equity



## ■ *Large Cap Over Small Cap*

Many 4th quarter trends have reversed this quarter as investors have dialed back their expectations of the speed and ability of the Trump administration to implement its agenda. Investors recalculating their expectations about changes in trade policy led to boosting prices of multinationals, particularly large tech companies. Large-cap companies did well with a strong 4th quarter earnings season, beating consensus and chalking up another quarter of earnings growth as a whole. Small-cap stocks took a breather after an exceptional 4th quarter and full year gains in 2016.

Only a few of the taxable portfolios stand out when looking at allocations based on market cap. Many of the portfolios rely on “total market” ETFs for all of their domestic equity allocation. For example, WiseBanyan, Vanguard, and SigFig all rely on the Vanguard Total Stock Market ETF, while TD Ameritrade relies the iShares Core S&P Total US Market for 100% of their domestic equities. These two total market ETFs have approximately 9% weights to small cap. Acorns suffered from having more than 32% of their equity position allocated to the Vanguard Small-Cap ETF, which returned only 3.35% compared to the S&P 500’s return of 5.53% for the quarter. Poor small-cap returns also detracted from both eTrade portfolios and Schwab’s portfolio with 20% and 17% of their domestic equity allocations in small-cap funds, respectively. Our other portfolios did not deviate significantly in small-cap allocation, all hovering around the 9-10% range for small-cap allocations.

Our IRA portfolio weights in respect to the total equity allocation did deviate some from the taxable portfolios but there was style consistency regarding which Robos had overweight small- and large-cap allocations.

## ■ *Return of Growth*

Lower unemployment, higher consumption, inflation, and 4th quarter growth numbers being revised helped bolster growth sectors, as investors bet on a stronger economy benefiting growth stocks the most. Decreased concerns around trade, as well as strong economic numbers, propelled tech to be one of the highest performers of the quarter. The

healthcare sector also led gains. In a reversal from the 4th quarter 2016, the telecommunications, energy, and financials sectors lagged, holding back value indices this quarter.

Interestingly, none of the portfolios we cover were significantly overweight in domestic growth equities, while quite a few were overweight value. Personal Capital’s portfolio is unique in our universe in that it has small allocations to five sector-specific ETFs. These sector-specific ETFs performed quite well in the 4th quarter of 2016, but they created drag on the portfolio in 1st quarter 2017. Their consumer staples, energy, materials, telecommunications, and utilities are all value-oriented ETFs, and with the exception of utilities, all underperformed the S&P 500 in the 1st quarter. Schwab’s portfolio is also overweight value in their large-cap allocation. FutureAdvisor similarly has large-cap weightings towards value. Betterment shows a value preference with allocation weightings at the large-, mid-, and small-cap levels. Ellevest also had value weightings at the large-, mid-, and small-cap levels but to a much smaller extent than Betterment. Both TradeKing portfolios had weightings towards value, but the Momentum strategy had a heavier weight towards value than the Core strategy. Our remaining portfolios showed little or no emphasis on value over growth. The different managers’ preference for value vs growth appeared in both the taxable and IRA accounts in cases where we track both.

## ■ *Fixed Income*

Fixed income markets showed perseverance in the 1st quarter, bouncing back from a disappointing 4th quarter of 2016 and withstanding a Fed rate increase to finish generally positive. The same risk-on sentiment that sent equities higher was noticeable to some extent in the bond market as well, as emerging market debt posted the largest gains in the period, while investors’ longer-term interest rate expectations kept high-yield and short-duration debt in favor. Moderation of the dollar also contributed to emerging market debt’s strong performance in the 1st quarter. In Europe, hints of a pullback on loose monetary policy increased sovereign interest rates leading to lackluster performance in many broad-based or developed international bond funds, especially those with large

allocations to developed international sovereign debt. In a reversal from the previous quarter, municipal bond returns were positive, though the headwinds of potential tax cuts still loom for these holdings. Finally, returns for corporate and government bonds showed little divergence in the 1st quarter of the year. A slight tightening of credit spreads helped corporate debt holdings, specifically high-yield holdings, generally outpace their Treasury-based counterparts.

Those portfolios that performed well in their fixed income strategies held emerging markets bond funds and high-yield funds. Other more broad-based international debt funds were mixed depending on the underlying assets. Although funds with high-yield and international exposure outperformed, these assets represent higher risk. Fidelity Go, eTrade ETF, Acorns, and Vanguard all underperformed, as they held only domestic and investment-grade bond funds.

Although Betterment relies on international debt for 36% of its total fixed income allocation, 22% of the fixed income portfolio is in the Vanguard International Total Bond ETF, which was down .29% over the quarter, moderating the gains in the allocation to emerging markets debt. Personal Capital benefited from allocations to both emerging market bond funds as well as high-yield bond funds. Personal Capital had a 10% and 14% allocation of total fixed income to an emerging markets bond fund and a high-yield fund, respectively, which added to performance. Schwab also had a large allocation to a high-yield fund making up 36% of its total fixed income exposure, additionally 22% of its fixed income was allocated to an emerging markets fund with strong performance. Combined with a 13% allocation of total bonds to the poorly performing Vanguard Total International Bond ETF, high-yield and international bonds made up 70% of Schwab's fixed income allocation. This large allocation to international and high yield bond funds may help explain why Schwab led the group for fixed income returns. SigFig was rewarded by allocating 23% of its fixed income funds to an emerging markets sovereign debt fund. FutureAdvisor had a large allocation to an international treasury bond that outperformed its domestic peers. Ellevest had allocations to an emerging markets bond fund, but gains there were partially offset by a similar sized allocation to the Vanguard Total

International Bond ETF. TD Ameritrade missed out on gaining from international fixed income allocation this quarter by allocating 9% of their total fixed income to the Vanguard Total International Bond ETF, which was one of the international bond ETFs that did not have underlying assets that performed well. WiseBanyan held a short term high-yield fund that did not significantly contribute to performance.

Our IRA portfolios were opened with an aggressive risk tolerance, meaning that we did not control for the amount of fixed income allocation, instead leaving it up to the Robo advisor to determine fixed income allocations. The largest factor in whether fixed income contributed or detracted from an IRA portfolio was the level of fixed income allocation, not the type of fixed income funds held. TD Ameritrade, Fidelity Go, and Betterment all had 12-15% of their total portfolio invested in fixed income, which detracted from gains in a quarter of strong equity gains. WiseBanyan and SigFig had fixed income allocations between 8% and 9%. TradeKing and Personal Capital had between 2% and 3% fixed income allocations, while eTrade and Schwab had little to no fixed income allocations. It is important to keep in mind that in up markets, the portfolios with no fixed income will likely outperform, but until we see returns that include more down market periods, it will be hard to judge which level of fixed income will produce the long-term winners.

## ■ *Alternatives and Real Estate*

Many of the portfolios we track contain exposure to real estate, while a few have exposure to commodities or gold. We see portfolios gaining exposure to domestic real estate through REITs and international real estate through ETFs that track indexes of non-US real estate equities. This quarter, domestic REITs as a group ended mostly flat as investors anticipate rising rates may cool off the sector. International real estate ETFs, on the other hand, had a very strong quarter, outpacing the domestic stock markets in most cases. Gold had a very strong quarter with the SPDR Gold Trust ETF returning more than 8%, a reversal from last quarter where it fell more than 12%.

Personal Capital and Schwab have the largest exposure to real estate and alternatives. Real estate and alternatives make up nearly 9% of their total portfolios. Both have exposure to domestic real estate, international real estate, and gold, while Personal Capital additionally holds a commodities ETF. As a group, their real estate plus alternative investments returned just under 2% for Personal Capital and over 5% for Schwab. Future Advisor and WiseBanyan both had relatively large allocations to domestic REITs, with 8% and 4% of their total allocation, respectively. These positions detracted from returns this quarter. Ellevest and TradeKing Momentum portfolios had nearly 3% in real estate each. Ellevest had exposure to both international and domestic real estate, while TradeKing Momentum held an international real estate fund as well as a small allocation to a global private equity fund. TradeKing Core also had less than 1% of total assets in a global real estate fund. TradeKing's allocations to real estate changed at quarter end as they transition to Ally.

In our smaller IRA universe, Schwab, Personal Capital, and TradeKing Core are the only portfolios with alternatives or real estate exposure. In the Schwab account, you see a lower level of alternatives plus real estate, 5% in the IRA compared to 9% in the taxable account. You also do not see gold exposure in the IRA. Personal Capital holds the same type of alternative investments between our IRA and taxable accounts, but there is slightly less exposure in the IRA. The TradeKing Core IRA, similar to the taxable account, has a small amount invested in a global real estate fund. It is interesting that, as we increase the risk profile from moderate to aggressive in the taxable vs IRA accounts for Schwab and Personal Capital, exposure to alternatives falls. Managers in these portfolios are likely looking at the risk-reducing properties alternatives can have on a portfolio.

## Taxable Returns

	Total		Equity		Fixed Income	
	YTD	1 Year	YTD	1 Year	YTD	1 Year
Acorns <sup>1</sup>	3.48%	8.14%	5.21%	13.72%	0.59%	-0.47%
Betterment <sup>2</sup>	4.50%	10.81%	6.25%	16.15%	1.09%	1.09%
Ellevest <sup>8</sup>	4.35%		6.11%		1.58%	
E*Trade (ETF) <sup>3</sup>	4.07%		5.85%		1.09%	
E*Trade (Hybrid) <sup>3</sup>	3.98%		5.49%		1.44%	
Fidelity Go <sup>7</sup>	4.24%		6.27%		1.29%	
FutureAdvisor <sup>3</sup>	3.79%		6.05%		0.82%	
Personal Capital <sup>4</sup>	4.23%	10.89%	5.18%	13.97%	1.51%	2.48%
Schwab <sup>5</sup>	4.52%	12.02%	5.97%	16.68%	2.39%	5.59%
SigFig <sup>6</sup>	5.21%	11.40%	7.27%	16.99%	2.02%	3.10%
TD Ameritrade <sup>7</sup>	4.66%		6.81%		0.64%	
TradeKing (Core) <sup>1</sup>	4.41%	10.01%	6.47%	15.54%	1.19%	1.93%
TradeKing (Momentum) <sup>7</sup>	4.89%	9.72%	6.53%	14.79%	1.71%	2.27%
Vanguard <sup>7</sup>	4.62%	9.53%	6.71%	16.10%	1.25%	-0.08%
WiseBanyan <sup>8</sup>	4.53%	10.76%	6.48%	15.64%	1.12%	2.31%

*\*Some accounts have not been open long enough for 1 year trailing returns*

## IRA Returns

	Total		Equity		Fixed Income	
	YTD	1 Year	YTD	1 Year	YTD	1 Year
Betterment IRA <sup>2</sup>	5.69%		6.42%		0.86%	
E*Trade (ETF) IRA <sup>3</sup>	5.74%		5.85%		-	
E*Trade (Hybrid) IRA <sup>3</sup>	5.50%		5.63%		-	
Fidelity Go IRA <sup>7</sup>	5.55%		6.40%		0.90%	
Personal Capital IRA <sup>4</sup>	5.22%		5.37%		2.22%	
Schwab IRA <sup>7</sup>	5.17%	15.94%	5.51%	17.06%	-	-
SigFig IRA <sup>6</sup>	7.08%	14.76%	7.51%	15.72%	3.46%	6.34%
TD Ameritrade IRA <sup>7</sup>	5.77%		6.86%		0.60%	
TradeKing (Core) IRA <sup>7</sup>	6.00%		6.34%		-0.35%	
WiseBanyan IRA <sup>8</sup>	6.33%	15.20%	6.80%	16.37%	1.37%	3.04%

\*Some accounts have not been open long enough for 1 year returns

## Taxable Account Facts

Portfolio	Fee	Account Minimum	Initial Asset Allocation (Equities / Fixed Income / Miscellaneous / Cash)	Current Asset Allocation (Equities / Fixed Income / Miscellaneous / Cash)	Initial Domestic / International Equity Split	Current Domestic / International Equity Split	Tax Efficiency Ratio (Percent Muni Bonds of Overall Fixed Income)
Acorns	\$1/month up to \$5k; 0.25% annually over \$5k	No minimum	62%/ 38%/ 0%/ 0%	64%/ 36%/ 0%/ 0%	84%/ 16%	84%/ 16%	0
Betterment	Digital Only: 0.25%; "Plus" (unlimited chat, 1 call/year with advisor): 0.40%; "Premium" (unlimited chat and calls with advisor): 0.50%; stop paying any fee on money above \$2MM	Digital Only: No minimum; "Plus": 100k; Premium \$250k	65%/ 35%/ 0%/ 0%	67%/ 33%/ 0%/ 0%	49%/ 51%	50%/ 50%	0.58
Ellevest	0.50% annually	No minimum	62%/ 36%/ 0%/ 2%	63%/ 35%/ 0%/ 3%	71%/ 29%	71%/ 29%	0.89
E*Trade (ETF)	0.30% (promo - fee waived for 2016)	\$10,000	60%/ 39%/ 0%/ 1%	60%/ 39%/ 0%/ 1%	75%/ 25%	75%/ 25%	0
E*Trade (Hybrid)	0.30% (promo - fee waived for 2016)	\$10,000	60%/ 39%/ 0%/ 1%	60%/ 39%/ 0%/ 1%	75%/ 25%	74%/ 26%	1
Fidelity Go	0.35% annually	\$5,000	61%/ 39%/ 0%/ 0%	61%/ 38%/ 0%/ 1%	71%/ 29%	69%/ 31%	1
FutureAdvisor	0.50% annually	\$10,000	59%/ 41%/ 0%/ 0%	58%/ 42%/ 0%/ 1%	49%/ 51%	47%/ 53%	0
Personal Capital	0.89% annually for the first \$1 million; lower at different tiers over \$1 million	\$25,000	68%/ 25%/ 5%/ 2%	69%/ 26%/ 4%/ 1%	70%/ 30%	70%/ 30%	0
Schwab	No fee	\$5,000	62%/ 23%/ 5%/ 10%	63%/ 21%/ 4%/ 11%	51%/ 49%	50%/ 50%	0.31
SigFig	No fee for the first \$10k; 0.25% annually over \$10k	\$2,000	61%/ 37%/ 0%/ 2%	61%/ 39%/ 0%/ 0%	59%/ 41%	61%/ 39%	0
TD Ameritrade	0.30% annually	\$5,000	65%/ 33%/ 0%/ 2%	66%/ 32%/ 0%/ 2%	65%/ 35%	64%/ 36%	0
TradeKing (Core)	0.30% annually	\$5,000	59%/ 38%/ 2%/ 1%	59%/ 39%/ 0%/ 2%	69%/ 31%	60%/ 40%	0
TradeKing (Momentum)	Now the same as TradeKing Core	\$500	55%/ 40%/ 4%/ 1%	59%/ 39%/ 0%/ 2%	69%/ 31%	60%/ 40%	0
Vanguard	0.30% annually	\$50,000	59%/ 41%/ 0%/ 0%	63%/ 37%/ 0%/ 0%	61%/ 39%	62%/ 38%	1
WiseBanyan	No fee	No minimum	64%/ 36%/ 0%/ 0%	65%/ 35%/ 0%/ 0%	62%/ 38%	62%/ 38%	0

\*Due to rounding, may not add to 100%



## IRA Facts

Portfolio	Fee	Account Minimum	Initial Asset Allocation (Equities / Fixed Income / Miscellaneous / Cash)	Current Asset Allocation (Equities / Fixed Income / Miscellaneous / Cash)	Initial Domestic / International Equity Split	Current Domestic / International Equity Split
Betterment IRA		No minimum	87%/ 13%/ 0%/ 0%	87%/ 13%/ 0%/ 0%	47%/ 53%	48%/ 52%
E*Trade (ETF) IRA	0.30% (promo - fee waived for 2016)	\$5,000	98%/ 0%/ 0%/ 2%	98%/ 0%/ 0%/ 2%	75%/ 25%	74%/ 26%
E*Trade (Hybrid) IRA	0.30% (promo - fee waived for 2016)	\$5,000	98%/ 0%/ 0%/ 2%	98%/ 0%/ 0%/ 2%	75%/ 25%	73%/ 27%
Fidelity Go IRA	0.35% annually	\$5,000	85%/ 15%/ 0%/ 1%	85%/ 15%/ 0%/ 1%	71%/ 29%	71%/ 29%
Personal Capital IRA	0.89% annually for the first \$1 million; lower at different tiers over \$1 million	\$25,000	91%/ 3%/ 2%/ 4%	94%/ 3%/ 2%/ 1%	70%/ 30%	70%/ 30%
Schwab IRA	No fee	\$5,000	94%/ 0%/ 0%/ 6%	94%/ 0%/ 0%/ 6%	54%/ 46%	53%/ 47%
SigFig IRA	No fee for the first \$10k; 0.25% annually over \$10k	\$2,000	91%/ 9%/ 0%/ 0%	90%/ 8%/ 0%/ 1%	45%/ 55%	45%/ 55%
TD Ameritrade IRA	0.30% annually	\$5,000	83%/ 15%/ 0%/ 2%	83%/ 14%/ 0%/ 2%	65%/ 35%	64%/ 36%
TradeKing (Core) IRA	0.30% annually	\$500	96%/ 3%/ 0%/ 1%	93%/ 5%/ 0%/ 2%	62%/ 38%	60%/ 40%
WiseBanyan IRA	No fee	No minimum	92%/ 8%/ 0%/ 0%	91%/ 8%/ 0%/ 0%	60%/ 40%	60%/ 40%

\*Due to rounding, may not add to 100%

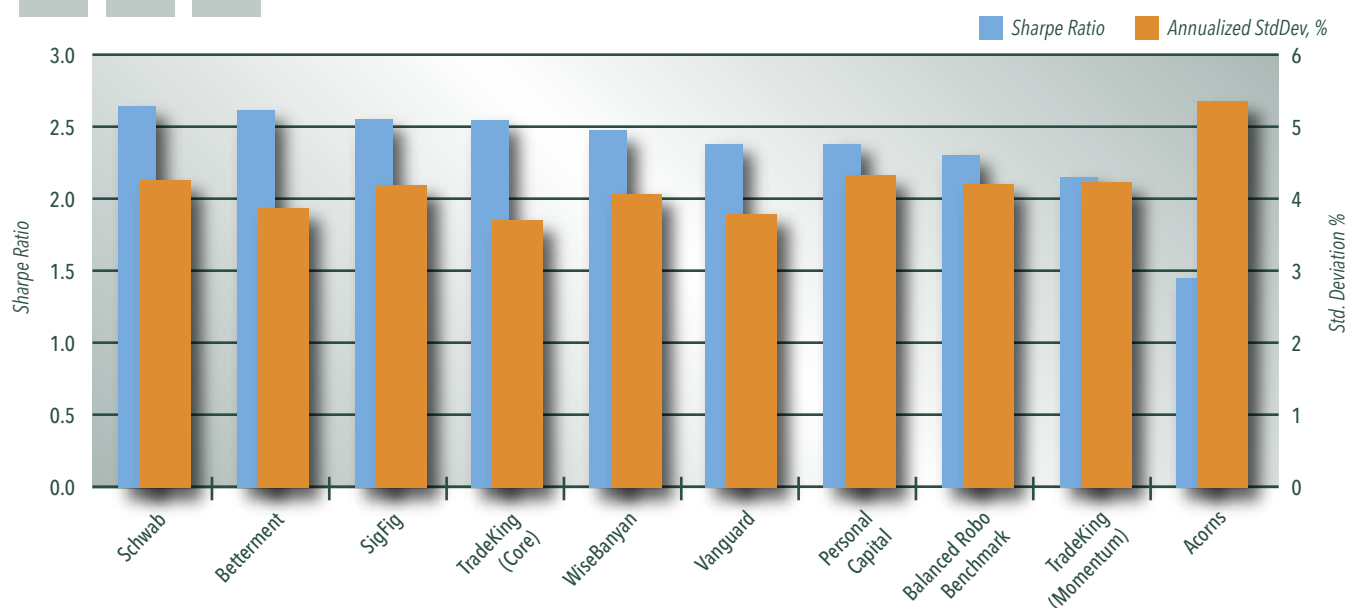
## Risk Return

When looking at returns only, an investor is only seeing part of the performance picture. To truly understand performance, investors must also look at the underlying risk of the portfolios. This can be measured by the standard deviation of the portfolio, which is a measurement of volatility. Also, investors commonly use the Sharpe Ratio as a metric, which is a measurement of the risk-adjusted returns. A higher Sharpe Ratio implies higher returns for each unit of risk.

We performed the risk-adjusted analysis for our individual portfolios that have been open for one year or more. Many of our IRAs will reach this mark at the end of the 2nd quarter, and we look forward to including risk metrics on the IRA portfolios next quarter. The analysis is based on 12 month returns ending 3-31-2017.

As we look at our collection of Robo portfolios, we see mostly what we would expect, with higher performing portfolios also showing higher standard deviation (risk). For example, Vanguard has the lowest performance in the group but also has the lowest standard deviation. That said, Vanguard's Sharpe Ratio is also the lowest, implying that it still performed poorly on a risk-adjusted basis. A better performer with low volatility was TradeKing's Core strategy, which had a standard deviation of 3.69% with a 10.01% 12-month return. The leaders in Sharpe Ratio also had high 12 month returns: Schwab, Betterment, and SigFig had Sharpe Ratios of 2.64, 2.60, and 2.54, respectively. These portfolios also had high standard deviations compared to their peers, but their performance more than compensated for their higher volatility.

## Risk/Return (Sharpe Ratio and Standard Deviation)



	Schwab	Betterment	SigFig	TradeKing (Core)	WiseBanyan	Vanguard	Personal Capital	Balanced Robo Benchmark	TradeKing (Momentum)	Acorns
Sharpe Ratio	2.64	2.6	2.54	2.53	2.47	2.36	2.35	2.3	2.16	1.43
Annualized StdDev, %	4.24	3.87	4.19	3.69	4.06	3.77	4.32	4.19	4.21	5.34

## Trades

Again this quarter we did not see many significant trades in our Robo portfolios. The most significant changes we saw this quarter were in the TradeKing accounts. TradeKing was purchased by Ally Financial last year, and this quarter they made significant trades as they migrated from the TradeKing portfolios to the Ally Invested Managed Portfolios. This represented a shift in asset allocation as well as asset selection. In the TradeKing Core portfolio, total equity dropped from 62% of the portfolio to 59%. The new portfolio saw a shift away from large-cap stocks to mid-cap. Although there was a similar level of international equities as a whole, there was a 2% shift away from emerging markets to developed markets. We saw the elimination of real estate exposure as well as the value tilt of the old portfolio. In fixed income, we saw a jump in the allocation of international bonds from 3% to 12%, swapping an old emerging markets bond fund for the Vanguard Total International Bond ETF. We also

saw the elimination of high-yield bonds in the transition and the introduction of a mortgage-backed security ETF.

The Personal Capital IRA deployed some of its cash to purchase small amounts of the Vanguard Total Stock Market ETF and the Schwab International Equity ETF. The Personal Capital taxable portfolio rebalanced away from equities and towards bonds, as well as a slight shift from small to mid cap. They also swapped out their main small-cap fund from the Vanguard Small-Cap ETF to the iShares Russell 2000 Index Fund ETF. The Fidelity Go IRA portfolio sold small amounts of small cap and international, purchasing mid and large cap as well as a broad US bond fund. We also saw trades that appear to be mostly rebalancing trades in the SigFig, WiseBanyan, Vanguard, FutureAdvisor, and eTrade accounts.

### Acorns

■ **Portfolio Notes.** This portfolio by Acorns contains no dedicated mid-cap exposure, thereby relying on blended large-cap and small-cap allocations for the domestic allocation. However, the portfolio does carry dedicated exposure to REITs and invests in investment grade corporate bonds as part of its fixed income allocation. Note that the portfolio also does not have exposure to developed international equities, instead holding an emerging market ETF for its foreign stock allocation.

### Betterment

■ **Portfolio Notes.** Betterment's portfolio noticeably avoids dedicated growth-specific ETFs, while using value-based investments to augment a domestic total stock ETF. Of note are a fairly large international developed equity position and a fixed income portfolio that contains taxable, international, and municipal bonds.

### Ellevest

■ **Portfolio Notes.** For the domestic allocation of this portfolio, Ellevest incorporates several value-specific ETFs, but no specific growth securities. REITs are represented globally by two distinct ETFs, while there is dedicated exposure to both foreign developed and emerging equities. On the fixed income front, international bond ETFs are included to augment a large allocation to municipal bonds.

### E\*Trade (ETF)

■ **Portfolio Notes.** This portfolio does not undertake any value or growth style bias, instead relying on core/blend ETFs. Furthermore, within the domestic segment, there is no dedicated mid-cap exposure. While there is no dedicated foreign stock ETF, an emerging market ETF is included in the portfolio. As for fixed income, the portfolio does not maintain dedicated exposure to high-yield or foreign bonds.

### E\*Trade (Hybrid)

■ **Portfolio Notes.** As its name implies, the portfolio uses both mutual funds and ETFs. This

portfolio does not maintain dedicated mid-cap exposure or a dedicated emerging market stock allocation. Like the E\*Trade (ETF) portfolio, there is no specific allocation to high-yield or foreign bonds. Instead, municipal bonds are used for the fixed income sleeve.

### FutureAdvisor

■ **Portfolio Notes.** This portfolio does not carry a dedicated domestic mid-cap option, though there is a REIT ETF included. To augment the foreign developed and emerging market large-cap equity allocations, the fund invests in a dedicated international developed small-cap ETF as well. The fixed income holds a large allocation to a TIPs fund and an international treasury fund.

### Fidelity Go

■ **Portfolio Notes.** The Fidelity Go portfolio refrains from taking on a style bias, instead gaining domestic stock exposure through dedicated large-, mid-, and small-cap ETFs. Additionally, municipal bonds make up the fixed income sleeve, so other areas of the fixed income market are not included.

### Personal Capital

■ **Portfolio Notes.** Personal Capital's portfolio, which consists of nearly 25 holdings, is one of the most diversified in our analysis. Its largest position by a good amount is in the Vanguard Total Stock Market ETF, a fund that in and of itself is diversified across the domestic equity market. One unique aspect of this company's investment strategy is its allocations to multiple sector ETFs, particularly in higher yielding and defensive sectors, such as utilities and consumer staples.

### Schwab

■ **Portfolio Notes.** This portfolio by Schwab contains no dedicated mid-cap exposure, instead relying on small-cap and large-cap investments for its domestic allocation. The portfolio does carry dedicated exposure to REITs, as well as small-cap international stocks. The portfolio also maintains exposure to commodities via the

iShares Gold Trust ETF. Finally, its fixed income holdings include high-yield corporate, municipal, and international bond funds.

### SigFig

■ **Portfolio Notes.** This portfolio by SigFig contains no dedicated mid-cap or small-cap exposure, relying on one total stock market ETF for the full domestic allocation. The portfolio carries dedicated exposure to international developed and international emerging markets ETFs. On the fixed income side, the portfolio owns a treasury inflation protected securities (TIPS) ETF and an ETF that allocates to emerging market sovereign debt.

### TD Ameritrade

■ **Portfolio Notes.** The account holds several highly diversified ETFs to gain stock and bond exposure across the globe. Specifically, there is one ETF for each of the following categories: domestic stocks, international developed stocks, emerging market stocks, domestic bonds, and foreign bonds.

### TradeKing (Core)

■ **Portfolio Notes.** The Core portfolio by TradeKing primarily contained large- and mid-cap ETFs to augment a total stock market ETF within the domestic equity realm, with a preference for value over growth. The portfolio does have a position in a global real estate ETF and a relatively large allocation to an international developed equities fund. Finally, the portfolio's fixed income exposure is relatively diversified, with positions in TIPS, investment-grade bonds, high-yield debt, and international bonds.

The new TradeKing portfolio after the transition to Ally looks to a broad based large, mid, and small cap fund for its equity allocations. It also holds a broad based international developed as well as emerging markets ETF for its international allocation. In fixed income it is unique among its peers that it holds a mortgage backed securities ETF. For international fixed income exposure it relies on a broad based international bond ETF. The new portfolio also no longer has real estate exposure.

### TradeKing (Momentum)

■ **Portfolio Notes.** The Momentum portfolio by TradeKing held category-specific domestic ETFs to gain exposure to large-cap, mid-cap, and small-cap stocks. TradeKing's Momentum portfolio has investments in both growth and value securities for each capitalization, with a greater weight given to the value funds. The portfolio carries dedicated exposure to REITs, both domestic and foreign. Finally, the portfolio maintains allocations to a wide range of bonds, including high-yield and international fixed income ETFs, in order to augment a core domestic bond position. This strategy has gone away with the transition to the Ally Invest Managed Portfolios. Both the TradeKing Core and Momentum strategies were transitioned to the same portfolio at the end of the first quarter 2017. See above for a description of the new portfolio.

### Vanguard

■ **Portfolio Notes.** Vanguard's Robo portfolio only contains five holdings, all of which are mutual funds. Its largest allocation is in a total stock market option, and it has no dedicated or ancillary exposure to US equities otherwise. Additionally, the portfolio contains exposure to international developed markets as its second largest allocation, though it does not maintain dedicated exposure to emerging market securities. The portfolio's fixed income exposure comes exclusively through three tax-exempt bond mutual funds, specifically limited-, intermediate-, and long-term funds.

### WiseBanyan

■ **Portfolio Notes.** This portfolio by WiseBanyan gains the majority of its equity exposure through the Vanguard Total Stock Market ETF and thus does not show weighting preference to specific sectors, market cap, or growth vs. value. The portfolio carries broad based ETFs for exposure in international developed and emerging markets. The portfolio also carries dedicated exposure to a variety of bond sectors, including TIPS, high yield, and investment grade corporate. The portfolio does not have dedicated exposure to international fixed income.



## Betterment IRA

■ **Portfolio Notes.** The Betterment IRA noticeably avoids growth-specific ETFs, while using value-based investments to augment a domestic total stock ETF. Of note are a fairly large international developed equity position and a fixed income portfolio that contains domestic taxable and international bonds.

## E\*Trade (ETF) IRA

■ **Portfolio Notes.** This portfolio does not undertake any value or growth style bias, instead relying on core/blend ETFs. Both a broad based international ETF and an emerging market ETF is included in the portfolio. As for fixed income, the portfolio does not maintain dedicated exposure to bonds.

## E\*Trade (Hybrid) IRA

■ **Portfolio Notes.** As its name implies, the portfolio uses both mutual funds and ETFs. An actively-managed mutual fund is used for domestic large-cap exposure as well as for the international stock allocation.

## Fidelity Go - IRA

■ **Portfolio Notes.** Five securities provide for exposure to the main areas of the global capital markets. Specifically, dedicated options are in place for the large-, mid-, and small-cap positions, while there is one for foreign stocks and another for the broader US bond market.

## Personal Capital IRA

■ **Portfolio Notes.** The Personal Capital IRA, which consists of almost twenty holdings, is one of the more diversified in our analysis. Its largest position by a good amount is in the Vanguard Total Stock Market ETF, a fund that in and of itself is diversified across the domestic equity market. One unique aspect of this company's investment strategy is its allocations to multiple sector ETFs, particularly in higher yielding and defensive sectors such as utilities and consumer staples.

## Schwab IRA

■ **Portfolio Notes.** This IRA by Schwab contains no dedicated mid-cap exposure, instead relying on small-cap and large-cap investments for its domestic allocation. With that said, the portfolio does carry dedicated exposure to REITs, as well as small-cap international stocks.

## SigFig IRA

■ **Portfolio Notes.** This IRA by SigFig contains no dedicated mid-cap or small-cap exposure, relying on one total stock market ETF for the full domestic allocation. With that said, the portfolio carries dedicated exposure to international developed and international emerging markets ETFs, as well as domestic REITs. On the fixed income side, there is not a core bond position; instead, the portfolio owns a TIPS ETF and an ETF that allocates to emerging market sovereign debt.

## TD Ameritrade IRA

■ **Portfolio Notes.** Five securities provide for exposure to the main areas of the global capital markets. A total domestic stock market ETF, alongside dedicated developed market and emerging market ETFs, combine for the overall equity exposure. Meanwhile, for the fixed income portion, the portfolio carries a broad domestic bond ETF and an international bond ETF.

## TradeKing (Core) IRA

■ **Portfolio Notes.** The Core IRA by TradeKing contains large-cap, mid-cap, and small-cap allocations within the domestic equity realm, with a preference for value over growth. With that said, the portfolio does have a position in a global real estate ETF and a relatively large allocation to an international developed equities fund. Finally, the portfolio's fixed income exposure is minimal, though relatively diversified, with positions in domestic bonds.

Going forward after transitioning to the Ally managed accounts there is large mid and small cap funds for the domestic equity allocation. Exposure to both developed and emerging markets between two different ETFs. An introduction of a mortgage backed securities ETF as well as exposure to international fixed income.

## WiseBanyan IRA

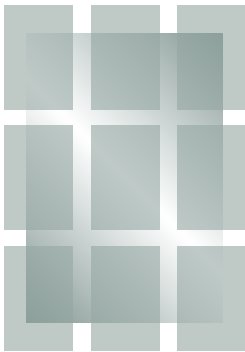
■ **Portfolio Notes.** This IRA by WiseBanyan gains the vast majority of its equity exposure through the Vanguard Total Stock Market ETF, thereby avoiding making significant bets via style or market cap. Along with a dedicated REIT position, the portfolio holds dedicated foreign developed and emerging market stock positions. The portfolio also carries exposure to investment grade and corporate bond ETFs as well as a TIPS ETF.

*DISCLOSURE:*

- <sup>1</sup> These accounts were funded with more than the minimum amount required to establish an account. Had the accounts been funded with more assets, they would be charged a same flat dollar fee up to \$5,000 or a flat percentage on assets under management fee over \$5,000. A higher advisory fee would have the result of decreasing reflected performance, while a lower advisory fee would have the result of increasing reflected performance.
- <sup>2</sup> This account has no minimum required to establish an account, but had the account been funded with more assets, it would, at certain asset levels, be eligible for a lower advisory fee. The lower advisory fee would have the result of increasing reflected performance. Additionally at certain levels of assets under management additional advisory services are available for an increase in fee's, if these services were subscribed to it would impact performance.
- <sup>3</sup> These accounts were funded with more than the minimum amount required to establish an account. Due to the flat advisory fee, performance is not affected by the accounts' asset levels.
- <sup>4</sup> This account was funded with the minimum amount required to establish 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.
- <sup>5</sup> This account was funded with more than the minimum in order to take advantage of tax loss harvesting. However, due to the flat advisory fee, performance is not affected by the account's asset level. Tax loss harvesting may result in better or worse performance compared to similarly positioned accounts that do not have tax loss harvesting associated with the account.
- <sup>6</sup> This account was funded with the minimum amount required to establish an account. Had the account been funded with more assets it would be charged the same or, in the case of over \$10,000, a higher advisory fee. A higher advisory fee would have the result of decreasing reflected performance.
- <sup>7</sup> These accounts were funded with the minimum amount required to establish an account. Due to the flat advisory fee, performance is not affected by the accounts' asset levels.
- <sup>8</sup> These accounts have no minimum required to establish an account. Due to the flat advisory fee, performance is not affected by these accounts' asset level.

*Wealthfront has decided not to participate in our study, and so is omitted from our report.*

*This report represents BackendBenchmarking's research, analysis and opinion only; the period tested was extremely 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.*



For more information, please contact BackendBenchmarking at [Info@BackendB.com](mailto:Info@BackendB.com)

*This report was brought to you by:*

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