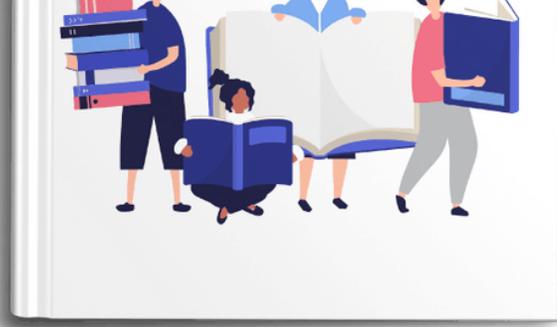


What is a Robo-advisor?

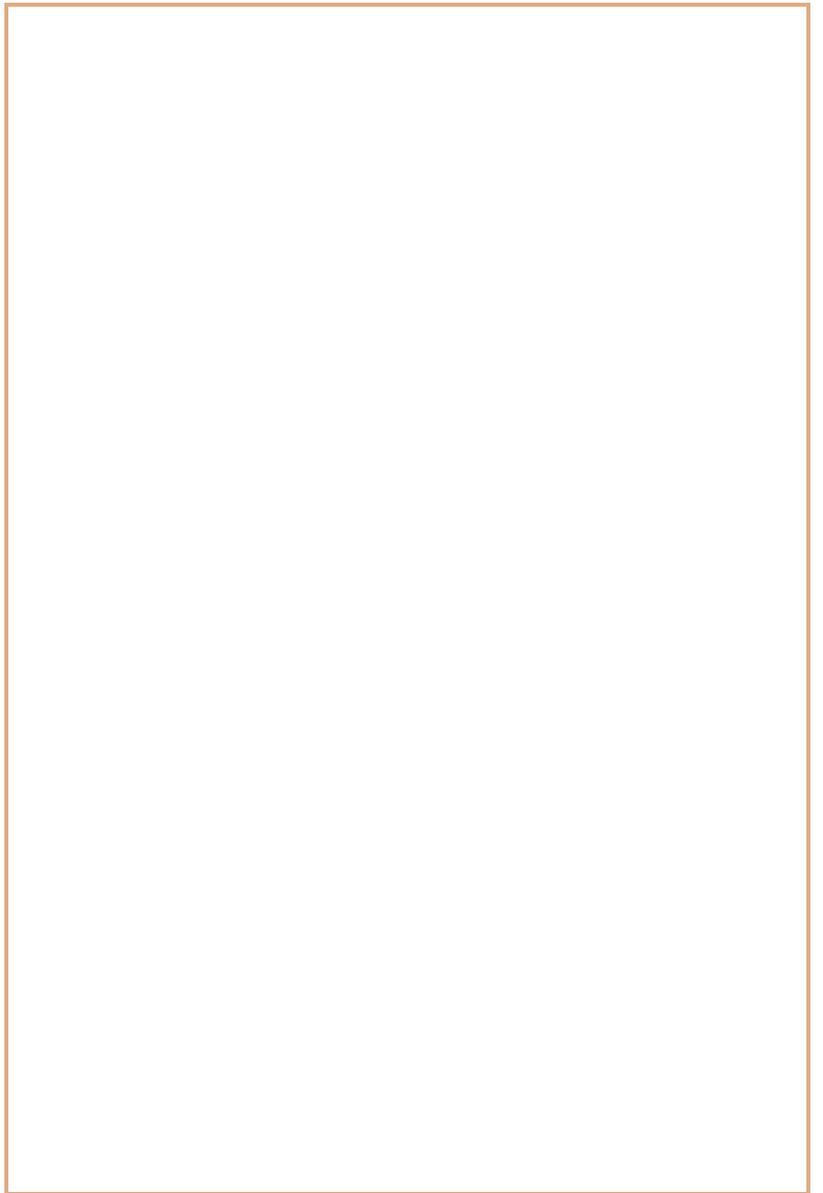
You will learn how Robo-advisors work, what their shortcomings are, and what the next generation of Robo-advisors will offer.

A stylized illustration of a book cover. The cover is white with a grey spine on the left. At the bottom, there are three small, colorful icons of people's heads and shoulders. The text on the cover is in a bold, black, sans-serif font.

**What is a
Robo-advisor?**

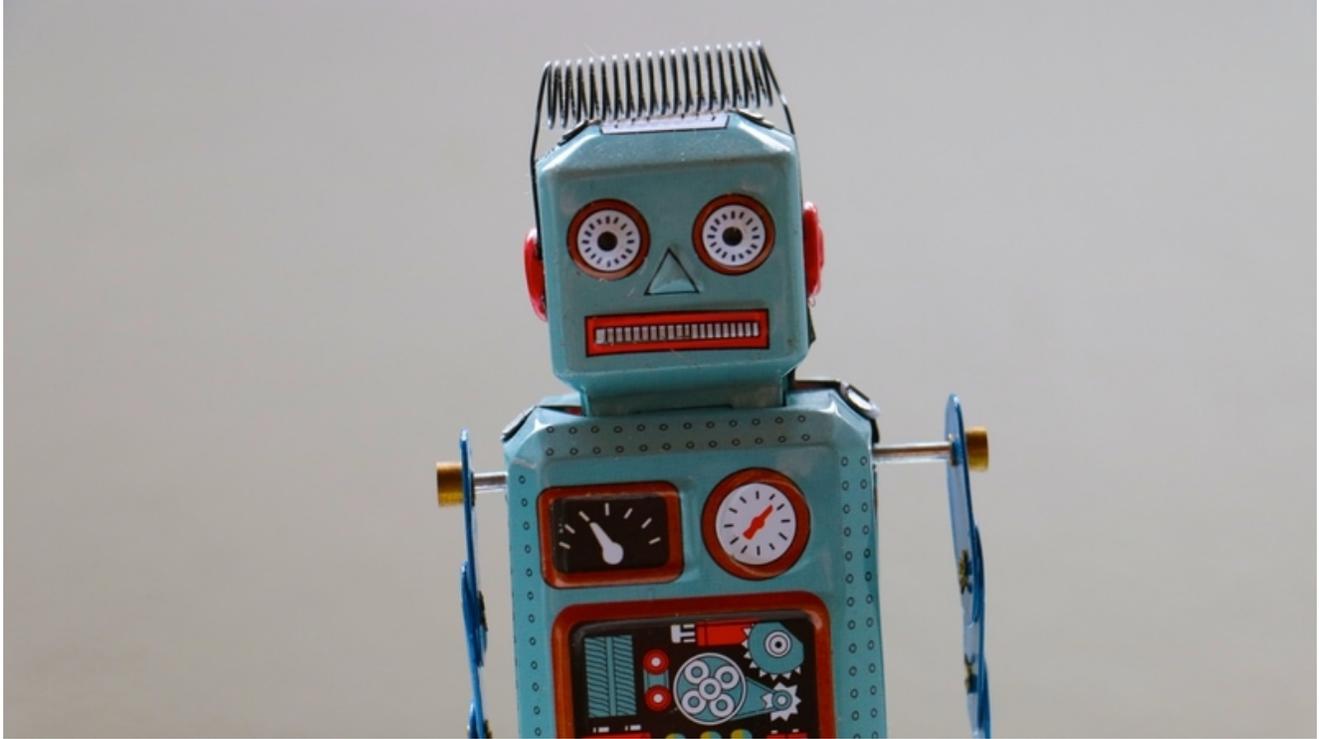


4 CHAPTERS



Chapter 1

What exactly is a Robo?



Robo-advisors, which are commonly referred to as Robos, are online services that automate the investment management process for nearly anyone.

With lower fees than human financial advisors and investment minimums as low as \$5, many of the headaches and barriers to entry when it comes to investing are kicked down.

It's common for these digital advisors to be online or mobile app based, enabling users to monitor their investment performance, add money, and adjust their investment goals from just about anywhere in the world, without having to call a human advisor.

Many Robos invest based on the same general finance theory and provide you with a diversified portfolio with exposure to stocks and bonds. I'll dive deeper into this in the next chapter.

Onboarding

When signing up, you fill out a questionnaire that asks financial and personal questions.

Common questions are:

- What is your age?
- What is your income?
- What is your net worth?
- What is your financial goal?

This is where the 'robo' part comes into play. A simple algorithm adds up all your answers together and assigns the most suitable portfolio they offer. This may be a bit confusing so below is an example walking you through your portfolio recommendation:

You answer all the onboarding questions. Each of these answers are scored internally and added together in order to convert you from a human to a number. This number represents your risk tolerance and is generally used in order to place you into one of 3 types of portfolios:

- Conservative: (Risk Score of 0-33)
- Moderate: (Risk Score of 34-66)
- Aggressive: (Risk Score of 67-100)

While some may have more than 3 portfolios and other ways of adding up their risk scores, the example above is a simple way to conceptualize how it works because *each company has their own way of recommending portfolios.*

Most people are surprised to find out that there is *no A.I. or machine learning being used.* Instead, it can be just simple logic stating that if your score is 20, you get placed in a conservative portfolio.

Chapter 2

How they invest.



Each of the three portfolios from the example above has been pre-built before you ever entered the picture. They are comprised of *ETFs, aka Exchange Traded Funds*. These funds seek to mimic the movements of an index.

For example, a stock index represents a specific group of stocks in the market.

You may have heard of the larger indices, such as the S&P 500, which tracks 500 large US public companies. There are many indices for many different niches in the stock and bond markets.

The goals of these passive index-tracking ETFs are:

- Tracking, not outperforming, their selected index
- Keeping fees low
- Diversification

Ready to go one level deeper? Keep reading.

Modern Portfolio Theory

How exactly do they figure out which ETFs to buy and how much of each to buy for their Conservative, Moderate, and Aggressive portfolios?

Enter the 66-year-old Nobel Prize winning finance theory called [Modern Portfolio Theory](#) (MPT), which is the foundation of how nearly all the digital advisors you've heard of invest. It is a 'buy and hold' strategy, and is just one of many investment theories or strategies out there.

Now, let's say a their team has selected 3 stock ETFs and 3 bond ETFs to construct their portfolios with.

At a top level, MPT attempts to calculate the optimal mixture of those 6 ETFs that could provide the highest expected return at different levels of risk.

It uses math to take out a lot of the human biases when it comes to asset selection, and aims to efficiently balance expected risk and reward. Sound's pretty good right?

For example, a lower risk conservative portfolio might have all 6 ETFs but with

a higher weighting towards bonds, while a more aggressive portfolio might have all 6 ETFs with a higher weighting towards stocks.

Once these MPT portfolios are created, they essentially remain unchanged over time since it assumes a buy and hold strategy, regardless of what's happening in the economy.

By grouping clients of similar characteristics into these three static portfolios that rarely change, Robos are able to easily monitor and trade for thousands of client accounts.

The reason why many Robos lean on this theory:

- Marketing: The creator Dr. Harry Markowitz won a Nobel Prize for MPT.
- Convenience: They don't have to create an investment strategy of their own.
- Automation: Can be calculated with statistical software or common programming languages without human involvement.

Rebalancing

One feature commonly found among is [automatic rebalancing](#).

Due to market movements, ETFs in your portfolio will go up in value and others down in value. Over time, this may cause the pieces of your portfolio to stray away from the optimal mixture that MPT originally designated.

A few times a year, a Robo may either buy or sell certain ETFs to bring you back to that optimal mixture, which is also called your target allocation.

A basic algorithm performs a quick calculation: Target allocation – Current

Allocation.

If this is a positive number, then it sells that amount. If this is a negative number, then it buys that amount.

Rebalancing can also occur when depositing and withdrawing money. When depositing funds, that money may first go to buying the ETFs that are currently below the MPT suggested target. When withdrawing funds, the digital advisor may first sell out of the ETFs that are above the initial MPT targets.

Tax-loss Harvesting

The very popular feature that many of these online advisors showcase is [tax-loss harvesting](#).

The general premise is that by selling an ETF at year-end that has decreased from the value you originally bought it at, you can use this loss amount as a write-off against your income tax.

The IRS came out with a ruling to limit selling for the sole purpose of tax avoidance called the [Wash Sale Rule](#). It states that the tax benefit will be void if you buy a “substantially identical” investment 30 days before or after the sale.

Rather than having an entire ETF missing from your portfolio for 30 days, they simultaneously buy another ETF that tracks a different index, but is highly correlated (98% - 99%) with the one that was just sold for a loss.

This in theory could allow you to stay fully invested and diversified to the MPT targets while also complying with the Wash Sale rule.

Summary

-Robos recommend you a portfolio (Conservative, Moderate, Aggressive), and then invest your money for you into this portfolio.

-This portfolio invests generally in ETFs that track certain markets, like the S&P 500 and the broader bond market.

-Portfolios are constructed based on Modern Portfolio Theory.

-Portfolios are rebalanced every so often to keep them in line with their desired weightings.

-Tax saving techniques can be employed in order to work around tax rules.

Chapter 3

Where Robo 1.0 falls short.



As much people think that we are getting closer to a Jetson's robot utopia, there is unfortunately *no hyper intelligent AI robot* behind the curtains pulling levers and hitting a big buy/sell button every millisecond. The only robot you'll find working at a Robo-advisor's headquarters may be a Roomba cleaning the floors.

The reality is that the only true innovations so far with the first wave of these advisors has been centered around convenience.

As Chapter 2 highlighted common features and benefits of Robo 1.0, this chapter aims to present their shortcomings to give you a well-rounded picture, and in the next chapter, what Robo 2.0 has already started rolling out for you to look forward to.

Where Modern Portfolio Theory / Passive falls short.

While MPT certainly has its merits in the theoretical world, it is derived on assumptions that may not necessarily hold in reality and is why it's received some criticism.

As tempting as it would be to open up Pandora's box and dissect each of the assumptions and the inner mathematical workings of Modern Portfolio Theory, it would be well beyond the scope and intent of this guide.

Instead, I'd much rather you have one takeaway.

Some Robos may use just the classical MPT version, and others may combine other theories to help address some of the criticisms. Regardless of the avenue, our internal study has shown that the daily portfolio returns of Robo 1.0's are still 98% correlated with each other (Round internal study of aggressive portfolios).

Either they literally hold the same ETFs, or have different ETFs that are highly correlated. At the end of the day, it is important to note that MPT is just one of many investment strategies.

On a top level, MPT may be a good way for you to build a good long-term buy and hold portfolio comprised of numerous ETFs, but it doesn't necessarily tell you which ETFs to choose. This means that someone at the digital advisor still has to decide which ETFs to pick.

MPT also assumes you will weather out any bumps along the road and will always remain rational, even if you see your portfolio performing poorly.

Imagine if stocks are having a bad year, and you still have a very high allocation to stock ETFs because you have a more aggressive portfolio. A dynamic portfolio with experienced investment managers has the ability to shift away from the more risky asset classes in risky times, while a Robo 1.0

will not change your portfolio at all on the grounds that markets go up, and markets go down so you should tough it out.

With so many different strategies and theories out there, you as a client have very little available to you in terms of differentiation when it comes to Robo 1.0. No matter which Robo 1.0 you pick, you will likely get similar results in a slightly different package.

Where Passive ETFs Fall Short.

Even if certain Robo 1.0's have slightly different ETFs, you still have the same concerns across the board. Passive ETFs can be beneficial by offering a cheap way to diversify, however, you get what you pay for.

With passive ETFs, there is no direct human involvement or risk management since its purpose is to passively track an index, not try and beat it with skill and experience.

If the index that your ETF is tracking goes up, you go up with it. When it goes down, you go down with it. You're a passenger along for the ride.

A mutual fund may charge more, but they have teams of researchers and traders who can *professionally shift around portfolios* as market conditions change.

Where Rebalancing falls short.

Since there is no human risk management and investment decision making, Robo 1.0's do not attempt to change weightings to ETFs on purpose. They robotically rebalance back to the targets after an ETF deviates more than a certain percentage, or once every set amount of time.

Let's take a look at bird's eye view.

Assume that ETF 1 went from \$100 a share to \$110 dollars a share, while all the other ETFs in the portfolio stayed at their \$100 share price. ETF 1 now makes up a higher percentage of the portfolio than was initially targeted. When ETF 1 becomes overweight, it means that it has appreciated in price relative to the rest of the portfolio, or in other words, it's a winner.

Now, assume that ETF 1 instead fell from \$100 a share to \$90 dollars a share, while all the other ETFs remained at \$100 per share. In this case ETF 1 depreciates in price relative to the rest of the ETFs in the portfolio, which makes it essentially a loser.

When a Robo 1.0 automatically rebalances without thought, they may be *selling out of winning ETFs and buying losing ones* in order to bring you back to your MPT targets.

Where Tax Loss Harvesting falls short.

Full disclosure, I am not a tax professional and you should talk with an accountant before taking any actions regarding tax-loss harvesting.

With that being said, if you start looking into the benefits of Tax Loss Harvesting, a big issue that many people miss is that it's a tax deferral, and not a tax savings.

As tax expert and risk management professor Kent Smetters from the University of Pennsylvania's Wharton School of Business states, when you sell an ETF at a loss, you're just lowering the entry point for the replacement ETF by the same amount.

Assuming that the ETF appreciates in value in the future, you'll be taxed on that gain at potentially a higher tax rate when you sell it (tax rates may very well increase as we've seen in 2018). Not only could there be a higher rate, you may be paying for it with dollars that are worth less in the future than they are today (otherwise known as inflation). For a more in depth read, click [here](#) or [here](#).

Another main limitation to note is that the maximum write-off is only \$3,000 a year against ordinary income. Anything beyond that \$3,000 can be rolled to future tax years to deduct against future capital gains or ordinary income. If you're looking at thousands of dollars of tax-loss harvesting write-offs, it may take years for you to actually use utilize those tax credits.

In order to truly avoid this deferment wall of capital gains down the road, you have two options:

1. Gift your ETFs to a charity
2. Pass the ETFs down to your heirs upon your death

While Tax Loss Harvesting is a novel feature, it may be more of a marketing gimmick than a truly beneficial tool for some investors.

Summary

Robo 1.0's aren't all bad, as they have made investing accessible to many new investors and have helped empower the next generation of people interested in investing.

It is important to see where there might be shortcomings with the current offerings, especially given that this industry is still in its infancy. We have yet to see more high-end asset management trickle down to the general population.

There is a lack of options when it comes to premium and differentiated investment strategies, as there is mainly a focus on Modern Portfolio Theory and passive ETFs.

This means that while rebalancing and tax loss harvesting are highly publicized features of Robo 1.0's, they may offer less value than anticipated.

Chapter 4

Enter Robo 2.0



Where Robo 1.0 had just generic stock and bond ETFs, I believe that the new wave of digitally enabled advisors will offer what the wealthy have had access to for a longtime; active investment management and alternative investments.

Direct Active Management

Active investment management is when there are highly qualified professional investment teams managing your money through researching and analyzing the economy and market conditions.

An active investment manager is able to use his/her experience to separate the bad from the good by holding specific assets at deliberate times in the economic cycle. Certain funds aim to beat the average return of that market, while also protecting your capital in a downturn.

Alternative Asset Classes

The holy grail of investing for many wealthy investors is investing in alternatives. Rather than being confined to just stocks and bonds, it opens you up to an ocean of other types of assets out there. Many large institutional investors reap the benefits of investing in areas like Private Equity, Venture Capital and Collateralized Loan Obligations (CLO's).

For example, CLO is a diversified pool of business loans that have provided *exceptional risk-adjusted returns* for ultra-high-net-worth investors.

Sometimes these loans are for companies that you have heard of, such as Uber, Four Seasons, and Petco.

Goodbye ETFs, Hello... Mutual Funds?

Where can you find this professional active management along with unique alternative assets? Good ol' fashion mutual funds.

A mutual fund is a portfolio of assets that a seasoned investment manager hand selects and actively manages with the support of a team of investment professionals. It's typical for this mutual fund manager to be distinguished in a very specific area of assets that they have built their career on managing and analyzing. These investment managers have the freedom to shift their portfolio around at any time depending on developments in the economy and markets.

While a fee can be charged at different times and in different ways depending on the type of mutual fund, the tremendous value that you can access from these Wall Street investment management titans can be well worth it compared to low-fee passive ETFs.

Mutual funds have become lean mean machines these days. With their fees *continuing to go down*, they are providing more value than ever for less.

Summary

While this is only one take on the future of this space, I believe that we're starting to see the following trend happening:

Robo 1.0 brought access, and Robo 2.0 will provide value.

With Robo 1.0 you have a cheap and easy way of participating in the financial markets, and there is nothing wrong with that.

With Robo 2.0 you will see the next generation of Robos providing access to wide array of investment strategies and products—similar to what the ultra-wealthy already have access to. Investors interested in a robo offering will no longer be stuck with just one way of investing.

With this guide, I'm hoping that you have some more information about how the first generation of Robo-advisors work and that you're able to see what the future holds for the industry!

Sign up to hear from me.

Your email address

Sign Up

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