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SoFi Wealth Investment Strategy and Methodology

Introduction

SoFi Wealth's mission is to make professional asset management available to everyone. We offer a low minimum investment, easy online onboarding process, transparent investment choices, and low fees to help our members reach their goals. Our offering is designed to be accessible to anyone who wants complimentary, personalized advice from live advisors, a hands-off wealth management approach, and a professional team to manage their money.

In deciding how to invest your money, SoFi Wealth combines statistical analysis based on Modern Portfolio Theory, professional judgement, and a belief in the broad efficiency of markets to build portfolios that seek to generate long-term returns consistent with the level of risk the client chooses. Our methodology relies on three core principles:

1) **Costs matter.** Investing in low-cost Exchange Traded Funds (ETFs) representing a broad range of global investment opportunities gives clients broad diversification at a very low cost.
2) **On average, markets are efficient.** We use a Nobel Prize winning theory, Mean Variance Optimization[i], to define appropriate mixes of asset classes for the clients' risk level.
3) **The past is not the future.** We adjust both our return expectations and portfolio compositions periodically based on changing market and macro-economic conditions.

We feel that active management of passive assets can add value for SoFi members over buying and holding index funds. This white paper explains how we use this methodology to create portfolios.

Active and Passive Investing

Passive investing means buying and holding securities that track one or more indices without any attempt to improve performance over those indices. Generally, index mutual funds and Exchange Traded Funds (ETFs) are passive investments that track a particular index such as the S&P 500 or Aggregate US Bond Index. These funds only change their portfolios when the index they track changes. As a result, they usually have low fees and performance that is very close to the underlying index.

On the other hand, active investing attempts to get returns higher than one could by passive investing. Such attempts might involve techniques like trying to time the market (buying when it is believed to be low and selling when it is believed to be high), rotating among sectors (such as energy, consumer staples, or technology) in order to hold only those sectors that are believed to go up next, or picking selective stocks that are thought to be undervalued vs. the market as a whole. Many mutual funds are actively managed. When active funds discuss their performance, they will typically compare it to their "benchmark" – the index they are trying to beat. Actively managed funds usually charge higher fees for their management, which can reduce their performance.

SoFi Wealth practices what we call active management of passive assets. We invest entirely in passive assets: index ETFs. Each ETF is constructed by its manager to emulate an index such as the CRSP Total U.S. Market index or the FTSE Emerging Markets index. However, we actively manage the mix of these assets. As strategic asset allocators, we choose the mix of these passive assets using a combination of statistical analysis based on Modern Portfolio Theory, macroeconomic data, and professional judgement. We adjust this asset mix periodically as economic and market conditions change and these changes impact our outlook for the future returns of investments that make up these indices.

The specific mix of these assets is determined by the risk level chosen by the investor and the type of account in which the assets are held. We offer five risk levels, from Conservative to Aggressive, and two versions of each model portfolio – one for accounts taxed normally (subject to immediate taxation) and one for tax-deferred or tax-free accounts such as Traditional and Roth IRAs.

We measure the performance of each model portfolio against a benchmark. Since we are not tracking just one index, but rather a blend of indices that could include exposure to stocks and bonds in any country, the proper benchmark must be diversified both across countries and asset classes. Our benchmark is a blend of the MSCI All Country World Index and the Barclays Global Aggregate Bond Index. These indices and the ETFs that track them contain global allocations of equities and fixed income investments. We blend these indices in the proportion of stocks and bonds held in each target model portfolio. For example, the benchmark for our Moderately Aggressive portfolio might be 75% MSCI World and 25% Barclays Global Bond, and our Moderately Conservative portfolio 33% and 67% respectively.

Why are we not passive asset managers? Both indices in the benchmarks are weighted by market value. In other words, if a certain stock has a large market capitalization (the value of the company, calculated by the number of shares outstanding multiplied by the share price) it will have a relatively large weight in the index. While this is a useful starting point, there are times where it makes sense to weight assets based on factors other than their size. Stocks usually have high market capitalizations because they have gone up in value over many years. However, past performance does not guarantee future returns. Because of this, SoFi Wealth will sometimes tilt away from those broad indices in a measured and controlled way.

What about the academic work and media reports that show active managers underperforming passively managed benchmarks? This is overwhelmingly due to trading costs and management fees[ii], not asset selection. After all, if it is hard

to find assets that will out-perform the market, it is equally likely to find assets that will underperform the market. Our market tilts are chosen with the understanding that markets are usually very efficient. However, our management fees are lower than most actively managed mutual funds[iii] and active investment managers[iv], and are waived for all SoFi borrowers during the life of their loan. Similarly, all SoFi Wealth clients do not pay transaction fees, account opening or closing fees, or other miscellaneous fees many other brokers and advisory firms charge. We expect to track (and have tracked in the past) much more closely to standard low fee ETF benchmarks than high-fee advisors or mutual funds.

Methodology

INVESTMENT UNIVERSE

The first step in defining active management of passive assets is to define the universe of passive assets being managed. Table 1 lists the asset classes that make up our set of possible investments. These asset classes will be represented in portfolios by ETFs that closely track the target indices.

TABLE 1

Potential Asset Classes	
Stocks	Bonds
U.S. Stocks	1-3 Month Treasury Bills
International Stocks	Inflation Protected Treasuries
Emerging Markets Stocks	Short Duration Treasuries
U.S. Energy Stocks	Intermediate Duration Treasuries
Real Estate Investment Trusts (REITs)	Short Duration Corporates
	Intermediate Duration Corporates
	High Yield Corporates
	Short Duration High Yield Corporates
	Short Duration Investment Grade Municipals
	High Yield Municipals
	Dollar Denominated Emerging Market Government

MEAN VARIANCE OPTIMIZATION

In order to tilt from our broad indices to our more granular asset classes we use a slightly modified version of a Nobel Prize winning theory: Mean Variance Optimization.[v]

Mean variance optimization is a statistical tool for finding the mix of assets that produces the highest expected return for a given level of risk. Note that this return is 'expected' – not guaranteed. The risk is the amount by which past returns on these assets have varied (the mathematical variance) from their average return (the mathematical mean). It is not intended to predict returns. It is used to find the best mix of assets given the data provided. It's a good starting point for finding the right mix of assets at each risk level.

Mean variance optimization can be computed several different ways.[vi] SoFi Wealth builds portfolios that attempt to maximize expected return subject to constraints on the variance (the dispersion of historical returns around the historical mean) and tracking error (the divergence between the return of the portfolio and that of the benchmark). Mathematically, the problem can be formulated as:

$$Max_{w}\ w' E_t[r_{t+1}]$$

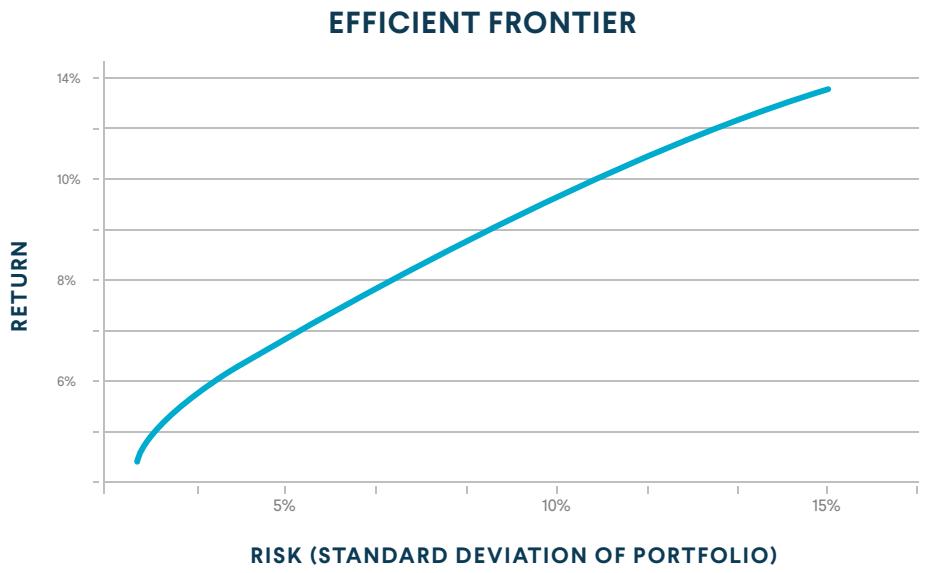
Subject to: $w'1 = 1,$

$$w'\Omega\, w \leq \sigma_p^2,$$

And $(w - w_b)'\Omega\,(w - w_b) \leq \overline{TE}^2$

Here, w is a vector of portfolio weights and $E_t\,[r_{t+1}]$ is the vector of expected returns for each asset at the next time period, whether that is one month, one year, even longer. The first constraint specifies that the sum of the weights must be equal to one, which means that the portfolio is fully invested and does not use leverage. The second constraint - Variance $(\sigma_p{}^2)$ - specifies that the variance of the portfolio cannot be larger than $\sigma_p{}^2$ (in expectation). The final constraint - Tracking Error $(\overline{TE}^2)$ - specifies that variance of the difference between the expected portfolio return and the expected benchmark return is below a pre-specified level. This final constraint limits how different our portfolios are from the broad market weight portfolio for each risk tolerance.

The optimal portfolio weights are a function of each asset's expected return, variance, and covariance with other assets. We can use these weights to form a portfolio with maximal expected return subject to the chosen variance constraint. Ignoring the tracking error constraint for illustrative purposes, and repeating this process for different variance constraints allows the construction of the efficient frontier: the maximum level of expected return at each level of risk. This idea is the cornerstone of Modern Portfolio Theory and the basis of our investment approach.



The hypothetical efficient frontier above is a graphical explanation of the portfolio creation process. We attempt to choose portfolios that lie on the efficient frontier at five discrete levels of risk (x-axis), ranging from conservative to aggressive and ensure they meet the tracking error constraint.

MEAN VARIANCE INPUTS

The key factor in any Mean Variance Optimization calculation is where the vector of expected returns $E_t\,[r_{t+1}]$, and covariance matrix Ω come from. The results of the optimization are determined by these inputs and any difference in the recommended allocations between different advisors who use mean variance optimization is based on differences in their choice of inputs. theory.

We start with historical data on returns and their variance. Of course, the past is not the future. The historical variance over a long enough time frame to encompass events such as the 2008 financial crisis is difficult to improve on. However,

historical returns are looked at more critically. We believe that subjective judgement and economic theory, while far from perfect, can improve investing outcomes compared with relying solely on analysis of past data.

THE DATA SET

The data used to calibrate and estimate our quantitative models consists of weekly returns for the last ten years of the indices listed above. Using indices instead of the ETFs themselves allows a much longer history of data from which to draw inferences while only introducing a negligible amount of measurement error due to the tracking error of the ETFs, which is usually very small. From this data set we compute the historical average return and estimate the covariance matrix.

EXPECTED RETURNS

Our return assumptions are a combination of historical returns, judgements about current valuation, and our macroeconomic forecasts.

Academic and practitioner research has suggested three methods of forecasting returns:

1. Historical data only
2. Subjective judgements about current value and future returns
3. Economic theory.

Using any one of these three methods is problematic since they all can produce a bad result. SoFi Wealth combines the three approaches in an attempt to find a better solution that overcomes the problems inherent in using each one alone.

Historical Data – Many asset allocators rely almost entirely on statistical analysis of past data. However, any prospectus will tell you that past performance does not predict future returns. Given the broad range of historic returns of many asset classes, using the average historical return of each asset class as the sole return forecast is rarely a good prediction of the future. Even worse, using historical data creates the possibility of what Michaud[vii] calls the "maximization of error" property of optimizers. This means that the mean-variance optimization calculation could pick up return/variance combinations that may be due purely to luck over the sample studied, and not a true representation of the return distribution of that asset. This can cause drastic underperformance when optimized.

We use a variety of quantitative methods in order to forecast expected returns. However, given the large variability in effectiveness of various predictors, we choose to use the historical mean as a starting point to anchor more subjective forecasts. While not an effective point estimate for future returns, it has the advantage of being robust and transparent over long periods of data that span multiple economic regimes.

Subjective Value Judgement – Most active managers rely to some degree on subjective judgements about the value of assets and their future returns. Ideally, these judgements are based on facts and data. For example, over a recent time period China A-Shares significantly outperformed because the Chinese government was manipulating their stock market. When that policy changed, a total reliance on past data would produce a return forecast on this asset class that was extremely unlikely to be repeated. Many managers changed their forecast accordingly.

Valuation metrics, including dividend yields, earnings yields, and others, have a long history in gauging expected returns.[viii] While their effectiveness as a predictor used in a linear regression type framework is suspect[ix], we find their use in relative valuation extremely helpful and informative. What is the dividend yield on ETFs of an asset class? How might expected changes in interest rates and exchange rates impact future returns? How might reasonably expected changes in fiscal, monetary, and tax policy impact returns on the asset class? These issues are debated by the SoFi Wealth Investment

Committee and adjustments to capital market expectations are considered. For instance, if our forecasts of returns imply an excessively high price to earnings ratio, we will revisit our assumptions to be sure we can justify that high valuation or change our forecast.

Economic Theory – Economic theories are imperfect and must be applied carefully. For instance, the market portfolio implied returns used as a base in the Black-Litterman[x] allocation algorithm (a common method of forecasting future returns used by many advisory services) may itself not be on the efficient frontier for a variety of reasons[xi]. However, we feel that ignoring economic data and trends in an ever-changing world can be perilous.

Our macroeconomic forecasts are particularly important, as they generally drive the greatest disparity in our portfolios versus their benchmarks. Macroeconomic forecasts generally involve central bank or government policy and/or the factors that determine domestic and global growth. For example, if Europe is lowering rates while the Fed is raising them, we might expect European stocks to outperform, all things being equal. This will bias our European return assumptions higher than they might normally be. Another example from the fixed income universe is the choice of duration. Duration measures the interest rate sensitivity of a bond's price. If interest rates are extremely low and there is broad agreement that they will head higher, we might choose to overweight short duration assets that are hurt less in a rising rate environment.

The SoFi Wealth Investment Committee includes experienced financial managers, each of whom has decades of experience in financial markets coming from such diverse backgrounds as private equity, derivatives, real estate, financial planning, central banking, and academia. Biographies of the members can be found on our website. This experience forms the basis for making informed subjective decisions in conjunction with quantitative, data-based methods and economic theory. We feel this allows a coherent method for strategic and tactical tilts away from the benchmarks in order to add value for SoFi Wealth members.

THE COVARIANCE MATRIX

Covariance is the degree to which a change in the historical return of one asset class was mirrored in the returns of another asset class. For example, a positive covariance means that the two assets have moved together in the past, and there is less diversification benefit in owning both. Conversely, if the covariance was negative, gains in the one class were matched by corresponding losses in the other. Perfect positive and negative relationships are almost unheard of. However, the larger the covariance is, the less diversification value one would expect from pairing the two assets. If you are comparing more that 2 asset classes, you end up with a matrix of how each class co-varies with every other class.

Estimation of the covariance matrix used in portfolio selection can be a complicated problem. The correlation between any two asset classes can change over short periods of time. Also, the more asset class pairs there are, the more complex forecasting their interactions can be. Fortunately, given the long term allocations chosen at SoFi as well as the use of ETFs that track asset classes rather than individual stocks or bonds, the standard sample covariance matrix suits our needs well. This covariance matrix Ω has entries ω_{ij} equal to the standard sample counterparts of variance and covariance:

$$\omega_{ij} = \frac{1}{T-1} \sum_{t=1}^{T} (r_{ti} - \bar{r}_i)(r_{tj} - \bar{r}_j)$$

TAXES

SoFi Wealth also adjusts portfolio allocations based on the impact of taxes on returns of securities held in taxable accounts. Since clients might hold assets in either a taxable or a tax deferred account, such as an IRA, we create two model

portfolios for each risk level. In the model set for taxable accounts, we adjust our return expectations for taxes before calculating the optimization. This will result in slightly different allocation that may, for instance, include municipal bond ETFs rather than corporate bond funds. This adjustment is based on current rates of federal taxation for different types of investments, at the average income level of our client base, and a mid-level of state income tax. Income taxes are an extremely complex topic and actual taxes paid by clients will vary widely depending on their income, the sources of that income, their deductions and exemptions, and their state of residence. This method makes no attempt to predict any specific rate of taxation, but rather to directionally account for the impact of taxes on the returns of different asset classes since this will often impact the optimum mix of asset classes at a given level of risk.

The Conservative Portfolio: An Additional Constraint

There exist situations where constraining volatility is not enough. For instance, if you are already in retirement and need income or are saving for a short-term goal that is nearly funded then capital appreciation is less important. Depending on the specifics of your situation, we may recommend the conservative portfolio strategy for you.

In order to better protect your investment, we overlay an additional constraint in the optimization. This is a constraint on maximum drawdown. A drawdown occurs any time your portfolio falls below the highest level it has ever reached. Normally, drawdowns are short lived and are due to the everyday gyrations in the market. Sometimes, however, markets can enter a prolonged period in which asset prices fall.

We want to be as sure as we possibly can that even should a case like this present itself (say something similar to the 2008 Global Financial Crisis) that your portfolio is not overly exposed. We thus require that any portfolio allocation used in the conservative strategy has had a maximum drawdown of 5% over our sample period. While history can only be a partial guide to the future, we think any portfolio that lost 5% or less during the Global Financial Crisis is well positioned to weather future market downturns without a significant loss of capital.

Final Allocations

Finally, the investment committee does one last qualitative overlay in order to avoid excess concentration or prevent ETF holdings that are less than 5%. Extremely small positions add little in the way of diversification or expected return but can be needlessly costly if they have higher than average expense ratios or add tax complexity. Through these small reallocations our initial volatility targets may change slightly, but we don't violate our constraint on tracking error.

Conclusion

SoFi uses active management of passive assets in an effort to create value for our members by the intelligent deployment of capital in long-term investing strategies. These strategies incorporate both strategic and tactical tilts away from popular global stock/bond benchmarks though the use of statistical analysis of historic data, economic theory and data, and the professional judgement of an Investment Committee with decades of experience in central banks and financial markets.

Have more questions for our team on how your investment is allocated, or want advice on reaching your next financial goals? Our team of non-commissioned, licensed financial advisors are available to help. Schedule a consultation or call us at 855-525-7634

[i] Markowitz, Harry. "Portfolio selection*." The Journal of Finance 7.1 (1952): 77-91.

[ii] Barber and Odean Journal of Finance Vol LV, NO 2. April 2000. See Figure 1.

[iii] Morningstar® 2015 Fee Study

[iv] RIA in a Box 2016 Registered Investment Adviser (RIA) Industry Overview Report

[v] ibid - Markowitz 1952

[vi] For example, maximizing a quadratic utility function subject to a budget constraint or minimizing variance subject to a return constraint. See (Elton et al. 2014) Elton, E.J., Gruber, M.J., 2014. Modern Portfolio Theory and Investment Analysis, 9th ed. Wiley, New York

[vii] Michaud, Richard O. "The Markowitz optimization enigma: is' optimized' optimal?." Financial Analysts Journal 45.1 (1989): 31-42.

[viii] Dow, Charles Henry. Scientific stock speculation. Magazine of Wall Street, 1920.

[ix] Goyal, Amit, and Ivo Welch. "Predicting the equity premium with dividend ratios." Management Science 49.5 (2003): 639-654.

[x] Black, F. and Litterman, R. (1990). "Asset Allocation: Combining Investors Views with Market Equilibrium." Fixed Income Research, Goldman, Sachs & Company, September.

[xi] Frazzini, Andrea, and Lasse Heje Pedersen. "Betting against beta." Journal of Financial Economics 111.1 (2014): 1-25.
