



HOW YOURSTAKE FINDS THE BEST FIT PORTFOLIO

YourStake's best fit algorithm takes a starting portfolio or risk preference, as well as optional values-alignment preferences, and finds the closest match model portfolio out of a universe of possible model portfolios. The universe of possible model portfolio matches can be configured by YourStake users by designating portfolios as "model portfolios" in the interface.

NOTE: If both a starting portfolio and a risk preference are selected, the risk preference will override the starting portfolio, and will be the basis of the best-fit match. This suits the use case where an advisor loads in a client's current portfolio that is out of alignment with the client's risk level, and wants to recommend a better fit portfolio for the client.

Best fit portfolio to a starting portfolio

1. Asset Allocation

The first step in the matching algorithm filters the universe of possible model portfolios down to those that are the closest fit based on the equity/fixed income split. For example, if an organization has 11 risk iterations of model portfolios (100/0, 90/10, 80/20...) across several investment strategies, and the starting portfolio is a 62/38 portfolio, then the only model portfolios that pass the filter will be the 60/40 model portfolios.

2. Factor-based Manhattan Distance

The following factor-based analytics are then calculated for the starting portfolio, and each model portfolio in the filtered universe:

- Asset allocation (US Stock, International Stock, Bonds, Cash)
- Underlying security concentration (looks through funds)
- Yield (Equity dividend yield and Fixed Income yield)
- Equity geography exposure (US, Developed, Emerging)
- Equity sector exposure (11 GICS sectors)
- Equity market cap exposure (Mega, Large, Mid, Small, Micro)
- Equity investment style (Growth, Blend, Value)
- Fixed Income type (Securitized, Municipal, Government, Corporate)
- Fixed Income duration (9 maturity buckets)

The difference between the starting portfolio and each model portfolio on each factor is determined by taking the Manhattan distance between the analytics to allow for a multi-dimensional difference calculation. The Manhattan distance between two points (p1 and p2) with coordinates (x1, y1) and (x2, y2) is $|x1-x2| + |y1-y2|$. For example, if a starting portfolio's geography exposure is 30% US, 50% Developed, and 20% Emerging, and it is being compared to a model portfolio with a geography exposure of 70% US, 30% Developed, and 0% Emerging, the Manhattan distance would be $|30\%-70\%| + |50\%-30\%| + |20\%-0\%| = 80\%$.

3. Factor Weightings

Each factor is weighed by its relevance to the portfolio based on the percent equity and fixed income in the portfolio. Asset allocation and security concentration have a weight of 1. The equity-based factors are weighted by the percent equity in the portfolio. The fixed-income based factors are weighted by the percent fixed income in the portfolio. The overall portfolio difference is then found by taking the weighted average of each factor's Manhattan difference, and the best fit model portfolio is the one with the minimum overall difference from the starting portfolio.

4. Values Adjustment

Advisors can select values preferences to incorporate into the best-fit selection, or load in values from a completed YourStake Values Questionnaire. If values preferences are selected, then the values-alignment of each model portfolio with the values selected is calculated. A factor for values-alignment is added to the overall portfolio difference calculation performed in the above step, with a weight equal to the sum of the other weights in the analysis, effectively assigning a 50% weighting to the values-alignment component relative to the aggregate weight of all factors. This updated overall portfolio difference is then minimized to find the best fit portfolio including values considerations.

Best fit portfolio to a risk preference

1. Risk Selection

Advisors can select a risk score to find the closest match portfolio, or load in the results from a completed YourStake Risk Tolerance Questionnaire. Client risk scores are calculated on a scale from 0-100, where 0-20 represents a conservative investor, 20-40 represents a moderately conservative investor, 40-60 represents a moderate investor, 60-80 represents a moderately aggressive investor, and 80-100 represents an aggressive investor. More details about how the Risk Tolerance Questionnaire generates a risk score can be found [here](#).

2. Portfolio Risk Scoring

Every security and portfolio on the YourStake platform is given a risk score from 0-100 based on the methodology described [here](#).

3. Best Fit Portfolio Selection

The model portfolio with a risk score closest to the client's risk score is chosen as the best fit portfolio.

4. Values Adjustment

Advisors can select values preferences to incorporate into the best-fit selection, or load in values from a completed YourStake Values Questionnaire. If values preferences are selected, then the values-alignment of each model portfolio with the values selected is calculated. The universe of possible model portfolios is first narrowed down based on risk score. If any portfolios have a risk score within 5 points of the client risk score, then the universe is filtered to only include portfolios with risk scores within 5 points of the client risk score. For example, if a client risk score is 61, then only portfolios with risk scores between 56 and 66 will remain in the universe of possible model portfolios. If there are no portfolios within 5 points of the client risk score, then the universe of possible model portfolios is filtered to only include portfolios within 10 points of the client risk score. After the universe has been filtered, the remaining universe of model portfolios are sorted by values alignment, and the top-aligned portfolio is selected as the best fit.