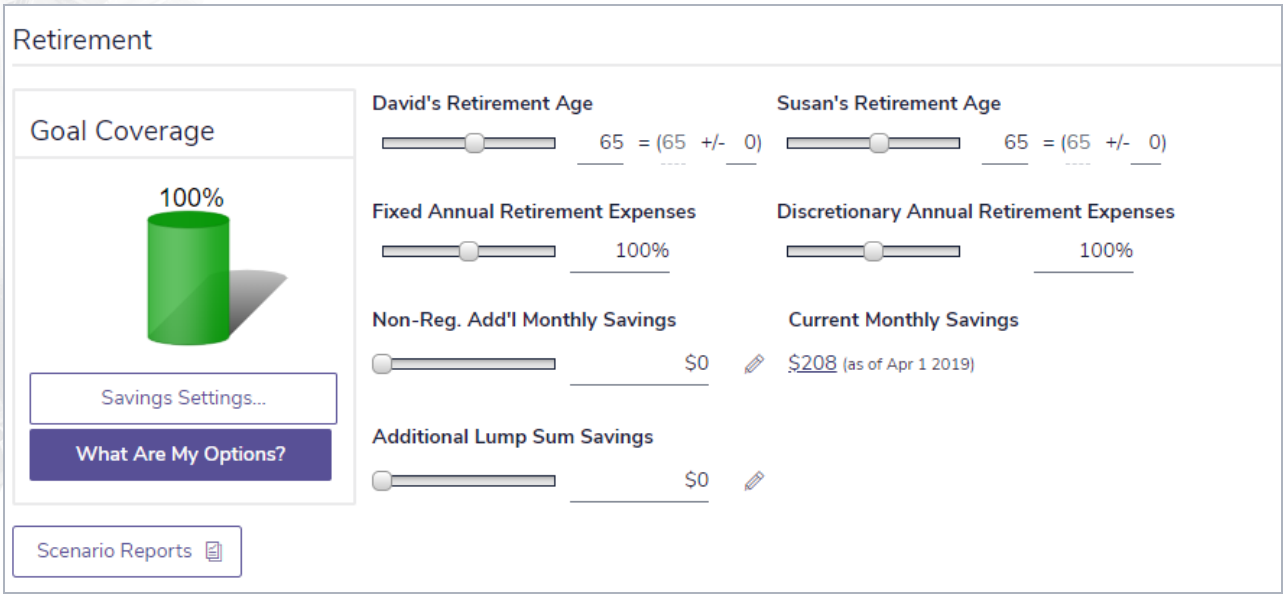
NaviPlan®
by Advicent

Scenario Probability Reports

Functions Addressed in this Document:

- How does scenario probability work in NaviPlan?
- How do you interpret the **Scenario Reports** graph?

You can find scenario probability here:



Results – Analyze Goals – Edit Recommended – Retirement

Scenario probability is a simulation tool that can be used to analyze the effect of market risk on individual What-if scenarios for each goal, which can affect the likelihood of the goal's success. For a Level 2 Plan, if the **Monte Carlo Analysis module** is selected on the **Modules** page (**Plan Management - Modules**), the option to generate a scenario probability analysis will become available in **Results - Analyze Goals - Review Current/Edit Recommended/Edit Alternative - Retirement/Education/Major Purchase - Scenario Reports**.

How does Scenario Probability work?

Scenario probability can be performed on individual What-if scenarios for retirement, education and major purchase goals. Scenario probability uses a similar methodology to NaviPlan's traditional Monte Carlo simulation but it calculates and presents results differently. Scenario probability illustrates the degree to which each trial can cover goal expenses, rather than tabulating successful and unsuccessful trials. Expressing the results as a percentage of the goal that can be covered (using available resources) in each trial is consistent with NaviPlan's **Goal Coverage** calculations.

DID YOU KNOW? In a traditional Monte Carlo analysis, the randomization of life expectancy on the retirement goal is optional. However, life expectancy cannot be randomized in a scenario probability analysis. When a scenario probability analysis is generated, the entire plan for the current plan date through to the set life expectancy dates is analyzed.

For retirement, education, and major purchase goals, a scenario probability analysis can be performed on an individual What-if scenario by clicking the **Scenario Probability** link within the ***Analyze Goals*** page (**Results - Analyze Goals - Review Current/Edit Recommended/Edit Alternative - Retirement/Education/Major Purchase - Scenario Reports**). Also for these goals, clicking the ***Compare Scenarios*** button (which opens the **Compare Scenarios** dialog box) followed by clicking the ***Scenario Probability*** button, allows you to compare two What-if scenarios.

DID YOU KNOW? A minimum of 100 trials and a maximum of 1,000 trials can be performed. As the number of trials increases, the time required to perform calculations also increases. Scenario probability results displayed within client reports is based on 150 trials.

How do you interpret the Scenario Probability graph?

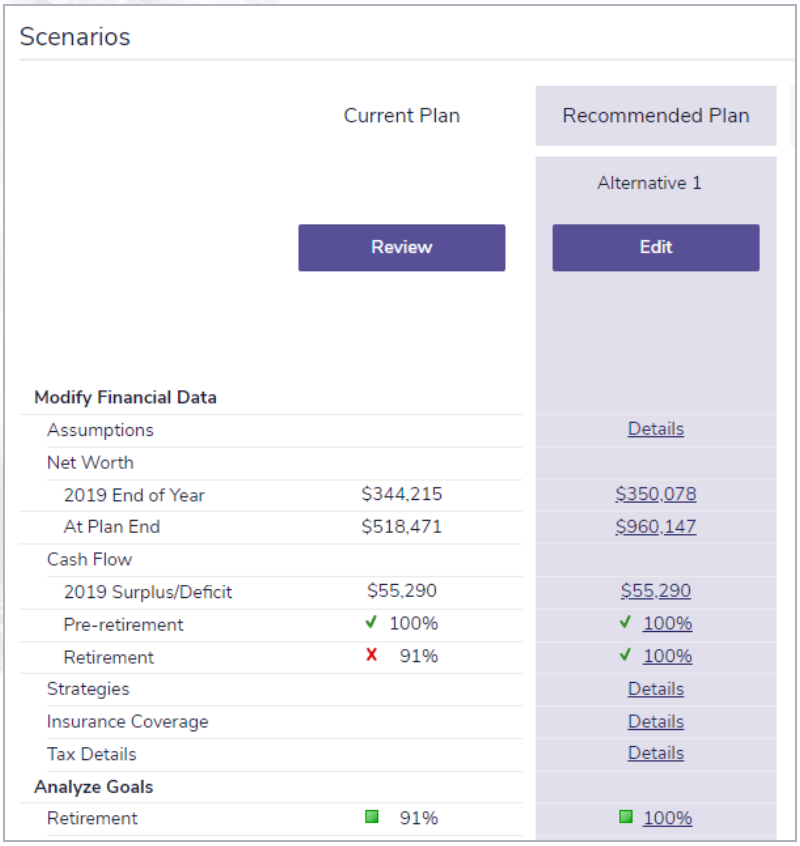
The **Scenario Probability** graph displays the goal coverage percentage for each trial to illustrate how much of the goal is covered. The percentage equals the ability to cover the total needs divided by the total resources, where both are adjusted for inflation.

The **Scenario Probability** graph colour-codes each trial based on the **Goal Coverage** percentage in descending order, and summarizes the number of trials where **Goal Coverage** is:

- 90% or above (displayed in green)
- In between 65% and 89% (displayed in yellow)
- 64% and below (displayed in red)

Example: In the **Current Plan** scenario for Joe and Jane's retirement goal, when each account is allocated to the goal earns its stated return, 91% **Goal Coverage** is achieved. The current asset mix return rate 4.82% reflects the weighted average for all accounts allocated to the goal. For the **Recommended Scenario**, if Joe and Jane earn a 8.32% return rate, 100% **Goal Coverage** is achieved.

When the return rate is randomized based on the standard deviation assumptions, the same goal coverage percentage may not be achieved in all trials, and the percentage reported on the **Results - Analyze Goals** page.



Scenarios

	Current Plan	Recommended Plan
		Alternative 1
	Review	Edit
Modify Financial Data		
Assumptions		Details
Net Worth		
2019 End of Year	$344,215	$350,078
At Plan End	$518,471	$960,147
Cash Flow		
2019 Surplus/Deficit	$55,290	$55,290
Pre-retirement	✓ 100%	✓ 100%
Retirement	✗ 91%	✓ 100%
Strategies		Details
Insurance Coverage		Details
Tax Details		Details
Analyze Goals		
Retirement	91%	100%

Results - Analyze Goals

Returning to Joe and Jane's retirement goal, we will run the scenario probability analysis (**Review Current Plan - Retirement - Scenario Reports - Compare Scenarios - Scenario Probability**). In the **Current Plan** scenario, when the return rate for each account allocated to the goal is randomized based on the standard deviation assigned to that account, 90% or more **Goal Coverage** is achieved in 0 of the 500 trials.

In contrast, in the **Recommended** scenario, when the return rate on assets is randomized based on a standard deviation of 14.29% (found at: **Results - Analyze Goals - Edit Recommended - Retirement**), 90% or more **Goal Coverage** is achieved in most of the 500 trials. While the base **Recommended** scenario had a 100% goal success, this assumed that the plan would receive a constant 8.32% rate of return. When the effect of market risk as measured by standard deviation is considered, Joe and Jane may not be able to sustain their desired retirement income.

Review Current Plan - Retirement - Scenario Reports - Scenario Probability

While, by default, the basis of the scenario probability analysis is the **% Total Needs Covered by Total Resources** option, NaviPlan also offers the ability to generate the analysis based on the **% Fixed Needs Covered by Total Resources** option, which excludes items such as expenses where the **Fixed Expense** checkbox has not been selected.

When either option is selected, NaviPlan calculates for each trial the age at which fixed expenses cannot be covered and then displays the trial, which reflects the earliest age when fixed expenses cannot be covered. In the case of Joe and Jane, in their **Recommended** retirement scenario, the earliest age at which they would not be able to cover their fixed expenses is at age 70.

DID YOU KNOW? Two additional tabs appear in the **Scenario Probability** dalog box. On the **Portfolio Variability Projection** tab, a graph plots the percentiles' rate of return over time as well as the assumed rate of return for the scenario from the current plan year through to and including the year of last death. On the **Investment Capital** tab, a graph illustrates the ending net worth value each year for the scenario, the 10th percentile, the 50th percentile, and the 90th percentile from the current plan year through to and including the year of last death. These two graphs are designed to assist in the understanding of underlying calculations for the analysis. They are only included in the **Scenario Probability** dialog box and are not included in the client reports.

DID YOU KNOW? Only the deferred growth component of an asset can support a negative number. If an asset has no deferred growth component, NaviPlan will not model a negative rate of return. If the **Scenario Probability** analyses' random fluctuation results in a negative return rate, then NaviPlan uses 0% as the rate of return, instead of the negative value.