**Investment Narrative**

Mabel is a single 65-year old retired school teacher who is considering how to invest $400,000. Her pension and social security cover her basic needs, such as housing and groceries. Therefore, her goal for the discretionary portfolio is to enjoy retirement. She intends to spend $60,000 annually for the next ten years on travel, restaurants, remodeling her home, and leasing a luxury car.

Mabel meets with her financial planner, Carla, to determine how to invest the $400,000. Both Carla and Mabel agree that the goal for the portfolio is to match the $60,000 cash flows over the next ten years. Mabel informs Carla that she is only comfortable investing in stocks and bonds because she does not understand other investments. In addition, she does not want more than 75% of the portfolio invested in either stocks or bonds.

Carla has purchased an investment model linking stocks and bonds from an investment bank. She imports this model into the Poppertech Calculator and simulates the performance of various stock and bond portfolios over the next ten years. Each year, a $60,000 withdrawal is subtracted from invested amount. If the portfolio value is insufficient to cover the withdrawal in any year, then the simulation is a failure. If the portfolio value exceeds the required cash flows in each year, then the simulation is a success. The Calculator runs 1,000 simulations and counts the number of successes.

Carla initially runs the simulations for an equal-weighted portfolio with $200,000 invested in both stocks and bonds. Of the 1,000 simulations, only 434 successfully cover the required cash flows. Mabel wonders if a better result is possible. Carla then performs Probabilistic Scenario Optimization using the calculator. Since Mabel specified that no more than 75% of the portfolio be invested in a single asset, Carla sets the Position Size Upper Bound to $300,000, or 75% of $400,000. Additionally, she sets both the Position Size Lower Bound and Interval between Scenarios to $100,000. As a result, the Calculator will run simulations for portfolios consisting of 25%, 50%, and 75% stocks and bonds. Then, it will choose the portfolio with the highest probability of matching the cash flows.

The Calculator runs the simulations for the three portfolios and tabulates the following results:

|  |  |  |
| --- | --- | --- |
| Stocks | Bonds | Probability of Success |
| $100,000 | $300,000 | .201 |
| $200,000 | $200,000 | .434 |
| $300,000 | $100,000 | .501 |

Therefore, investing in 75% stocks seems to be the best choice since it results in the highest probability of success. However, a 50% chance of success seems low to Mabel. She wonders: what would happen if they adjusted the cash flows to be $45,000 per year instead? Also, what if they use a different set of investment forecasts instead of Carla’s chosen model?

The Poppertech Calculator enables Carla and Mabel to iterate over the possibilities until they have analyzed the relevant tradeoffs and concluded on how best to satisfy Mabel’s goals.