Case Study

Retirement Planning Based on Stochastic Financial Analysis
Fiserv Helps Investment Professionals Improve Their Retirement Planning Practices

Many personal financial planning solutions rely on using a deterministic approach to forecast financial projections. This traditional method does not account for the unpredictable volatility of market returns. Retirement Illustrator from Fiserv is an innovative retirement planning solution powered by Monte Carlo simulations and “What If” capabilities.

Retirement Planning Needs are Evolving
For decades, Monte Carlo simulations have been used by advisors to estimate the probability of financial success for an investor’s financial plan. Probability of success is calculated by simulating multiple financial scenarios. Returns on the investment portfolio are based on random numbers generated for each year that is forecasted. The numbers are then predicated using historical data, based on the expected return for the portfolio and its variability.

Subsequently, simulation results are analyzed based on the value of the investor’s financial assets at the end of the last year of their planning horizon. The simulation is deemed a success if the financial assets in the last year of retirement are greater than $0.00, and is deemed unsuccessful if the financial assets in their last year are less than $0.00. Although the probability of success is a valuable metric, it does not provide a complete picture of a client’s financial outlook.

Fiserv Solution
The most comprehensive analysis can be achieved by leveraging the power of stochastic financial planning in Retirement Illustrator. The Fiserv solution uses Monte Carlo simulations to generate projections based on poor, average and above average market conditions.

There are several benefits of stochastic financial planning, including:

- Stress-testing retirement plans by determining the impact of a sub-par market return over the holistic planning horizon
- Providing a family of results, based on varying market conditions, so investors can comprehend the “upside” and “downside” of the developed plan

Client Profile
- John and Jane Wilson are “mass affluent” investors with $325,000 in qualified assets and $325,000 taxable assets
- John, 52 years old, and Jane, 48 years old, still have eleven working years left, expanding their ability to save
- The couple’s risk profile ranks them as moderately conservative
To demonstrate the benefits of stochastic financial planning, a case study was analyzed based on fictitious mass affluent clients, John and Jane Wilson. John is 52 years old and his earnings amount to $85,000 per year; Jane is 48 years old and earns $40,000 per year. The couple holds $325,000 in taxable investment assets and $325,000 in qualified investments, with a risk profile that indicates a moderately conservative asset allocation. To perform a financial analysis, Retirement Illustrator was utilized to pull retirement metrics.

### Analysis

The initial analysis of the client’s financial outlook (Figure A) was performed based on average market conditions. Results indicated in the chart below demonstrate that there will not be cash flow issues during retirement.

However, when evaluating the client’s cash flow based on below-average market conditions (Figure B), it is evident that there could be a financial shortfall during retirement.
Further analysis reveals remedies to the cash flow issues in addition to prudent suggestions that would help improve the client’s financial lifespan.

- **Increase Savings:** Figure A demonstrates excess income that has not been appropriately allocated (For the purpose of this study, an additional $5,000 in savings per year was allocated to the client’s 401(k) plan)

- **Reallocate Assets:** Adjust assets to align with the client’s risk assessment ranking of “moderately conservative”

- **Purchase Annuities:** To ensure there will be adequate cash flow during retirement and to mitigate risk, 50 percent, or $162,500, of taxable investments were used to purchase a deferred fixed annuity with John as the named annuitant

Implementing these modifications to the client’s financial projections resulted in a significant improvement to cash flow issues, as demonstrated in Figure C.

![Figure C](image1.png)

The inclusion of a fixed annuity not only demonstrated the power of modeling multiple market conditions, poor and favorable, but also the ability to address longevity risk. The cash flows when John’s life expectancy was changed from 90 to 95 are demonstrated in Figure D.

![Figure D](image2.png)
Life Insurance Analysis
Analysis of the client’s life insurance requirements also reveals the need to predict the required life insurance coverage based on varying market conditions. Income and expense projections based on John dying in 2012 indicate that there will be sufficient financial assets for his surviving spouse in average market conditions.

When evaluating the surviving spouse’s cash flows based on below-average market conditions, a financial shortfall during retirement is likely.

Further analysis by Retirement Illustrator indicates the potential financial shortfalls can be addressed by adding a $300,000 life insurance policy.
Long-Term Care Analysis

As a final example of the power of stochastic financial planning, the study includes an analysis of long-term care. This analysis is based on John incurring a long-term care expense of $200 per day (current dollars) for four years beginning at age 70. His expenses are assumed to increase at an annual rate of five percent.

Under average market conditions it appears that the Wilsons will be able to adequately address the long-term care expenses as displayed in Figure H.
In poor market conditions, it is evident that the Wilsons will experience cash flow issues.

The cash flow issues can be addressed with the purchase of a long-term care insurance policy that includes benefits of $200 per day with a policy inflation rate of five percent.

**Conclusion**

The case study demonstrates the power of forecasting multiple market conditions when financial projections are performed on retirement, life insurance and long-term care analysis. In all three analyses, the case study indicated that under an average market condition assumption, the client would have sufficient financial resources during retirement. However, when the same analysis was performed based on future financial returns modeling a poor market condition, the clients were projected to deplete their financial resources in retirement.

Just as important as identifying the impact of poor market conditions is the methodology’s ability to demonstrate the impact of employing solutions to mitigate retirement risks. After modeling the appropriate solutions, it was demonstrated that the client had sufficient financial assets during retirement in poor market conditions, increasing the probability of a successful
In addition, Retirement Illustrator performs analysis and provides results based on below-average, average and above-average market conditions. These conditions are determined by performing hundreds of simulations. In each simulation, the returns on the investment portfolio and inflation rates are randomized year over year throughout the entire analysis. The randomly generated numbers are predicated on the expected return for that portfolio and the associated variability.

Simulation results are then sorted based on the value of the financial assets in descending order at the end of the last year of the investor’s planning horizon. Market conditions are derived using specific criteria customized to each investor’s needs.

The cash flows identified were then applied to the calculations and algorithms used to derive the metrics shown in the charts throughout this case study.

**Portfolio Allocation**

Based on this analysis, the moderately conservative client’s portfolio allocation requires reallocation.

![Figure K](image)
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Challenge

- Conventional financial planning solutions do not provide a complete picture of an investor’s financial outlook
- Traditional methods do not depict a realistic forecast of varying market conditions, nor do they overlay risk management and strategies

Solution

- The solution stress tests retirement plans by determining the impact of a sub-par market return over a holistic planning horizon
- Enhanced capabilities model unlimited strategies, converging the optimal solution for any client’s need
- Ability to model annuities, life insurance and long-term care insurance, which addresses potential risks associated with market returns, early death and adverse health conditions

Proof Points

- Retirement Illustrator demonstrates how financial products can address an investor’s financial outlook projected in multiple market conditions
- By modeling favorable and unfavorable market conditions, the solution can uncover potential financial issues that investors may experience

Connect With Us

For more information on Retirement Illustrator, please contact us at 855-346-4625 or visit www.fiserv.com.