
AllocationMaster Report

Prepared for:

[REDACTED]
(Main Scenario)

March 20, 2019

Prepared by:

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This asset allocation analysis is provided to you for informational purposes only. Actual investment results may be materially different from the projected performance results portrayed. This report uses information that is considered reliable, but it does not represent that the information is accurate or complete, and the report may not be relied upon as such. The report is not intended to be either an expressed or implied guaranty of actual performance. It is not intended to supply tax or legal advice. There is no solicitation to buy or sell securities. The deduction of advisory fees, brokerage or other commissions, and any other expenses that would have been paid may not be reflected in the analysis. The results portrayed reflect the reinvestment of dividends and other earnings.

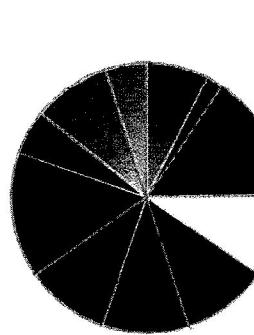
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Snapshot

Client Birthdate: 12/24/1954

Assets:

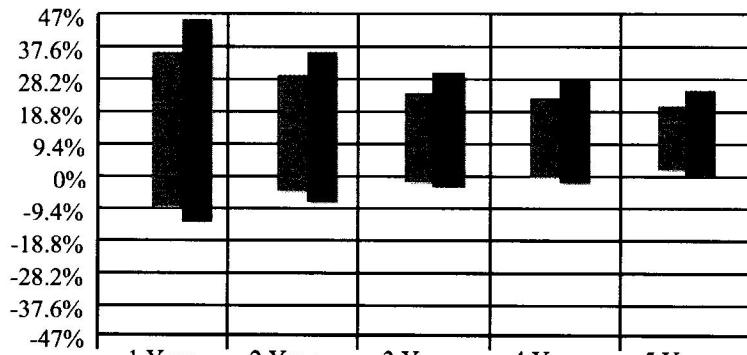
Non-Qualified:	\$82,597
Qualified:	\$1,071,215



Proposed Mix

Before-Tax Arith Return	7.09%
Before-Tax Geom Return	5.94%
After-Tax Arith Return	6.98%
After-Tax Geom Return	5.86%
Std. Deviation (Risk)	15.58%
Sharpe Ratio	0.45
After-Tax Annual Yield	1.77%

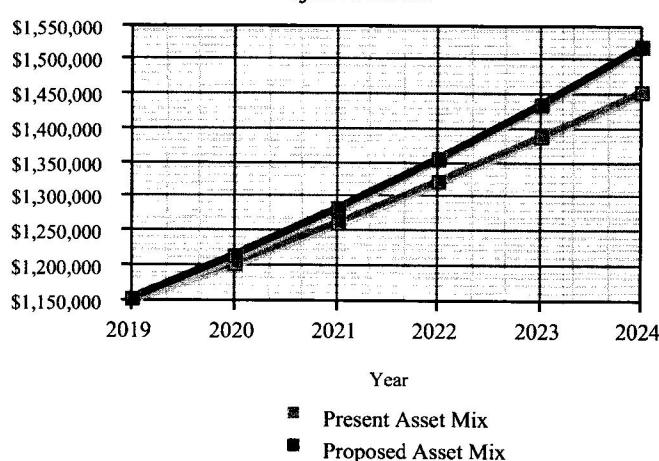
Range of Returns



- Present Asset Mix
- Proposed Asset Mix

Inflows/Outflows

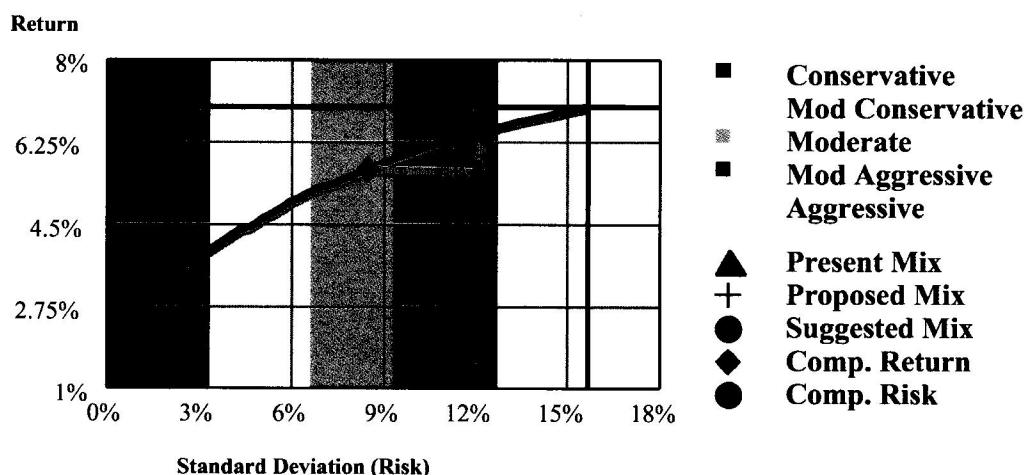
Projected Assets



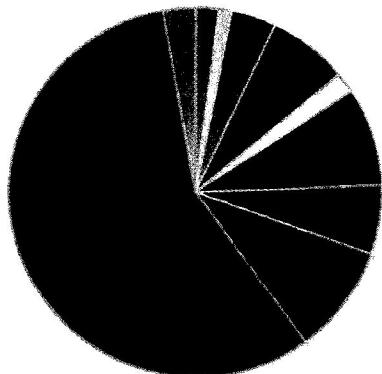
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Efficient Frontier - Present Mix

Efficient Frontier



Present Asset Allocation - (All Accounts)



1.94% \$22,334 Cash Equivalents	8.63% \$99,564 Small Value Stocks
1.14% \$13,098 Inter-Term Govt Bond	6.05% \$69,770 Small Growth Stocks
3.87% \$44,663 High Yield Bonds	9.55% \$110,237 Foreign Developed Stocks
6.96% \$80,297 Large Value Stocks	57.16% \$659,525 Balanced Funds
1.80% \$20,750 Large Growth Stocks	2.91% \$33,574 Real Estate

Total 100% \$1,153,812

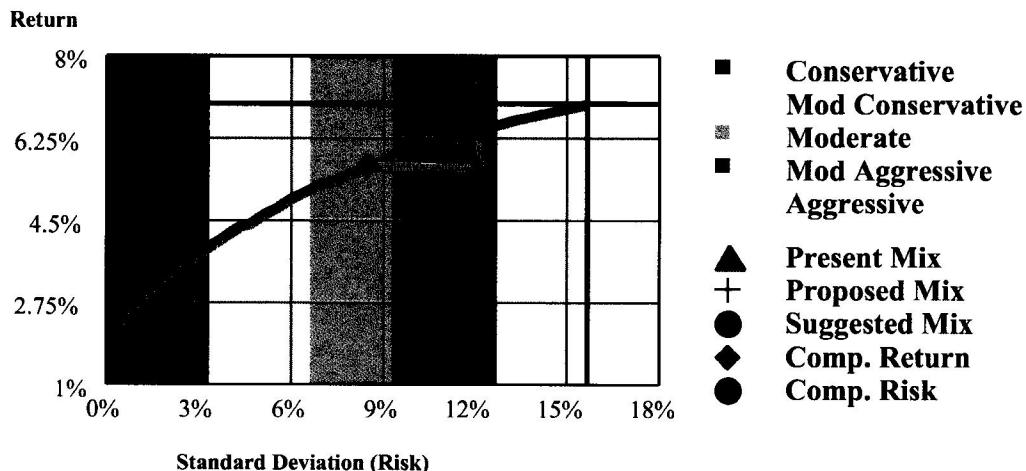
	▲ Present Mix	◆ Comp. Return	● Comp. Risk
Before-Tax Annual Arith. Return	5.74%		
Before-Tax Annual Geom. Return	5.04%		
After-Tax Annual Arith. Return	5.64%	5.68%	6.48%
After-Tax Annual Geom. Return	4.96%		
Standard Deviation (Risk)	12.02%	8.47%	12.16%
Sharpe Ratio	0.47	0.67	0.53
After-Tax Yield	2.49%	2.89%	2.08%

Please see the glossary for an explanation of any terms used on this page. Past performance of an investment is not an indication of its future returns. Comp. Return/Comp. Risk = Comparative Return/Comparative Risk. **PLEASE REFER TO THE 'GLOSSARY - KEY TERMS' PRINTED REPORT PAGE FOR MORE INFORMATION.**

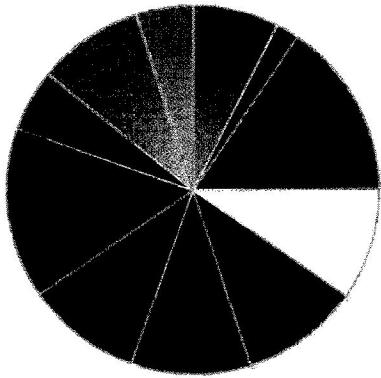
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Efficient Frontier - Proposed Mix

Efficient Frontier



Proposed Asset Allocation - (All Accounts)



7.43% \$85,712 Cash Equivalents	10.00% \$115,437 Mid Cap Stocks
1.92% \$22,196 Long-Term Govt Bond	15.01% \$173,139 Foreign Developed Stocks
15.36% \$177,270 Large Value Stocks	5.36% \$61,868 Emerging Market Stocks
9.90% \$114,176 Large Growth Stocks	9.29% \$107,140 Real Estate
10.36% \$119,569 Small Value Stocks	5.00% \$57,736 Venture Capital/L.P.
10.36% \$119,569 Small Growth Stocks	

Total 100% \$1,153,812

▲ Present Mix + Proposed Mix ◆ Comp. Return ● Comp. Risk

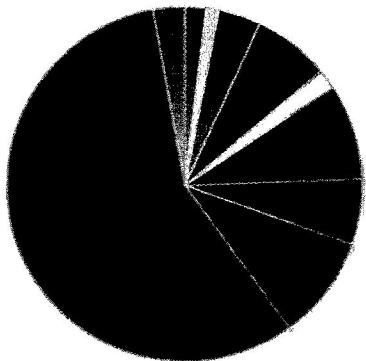
Before-Tax Annual Arith. Return	5.74%	7.09%		
Before-Tax Annual Geom. Return	5.04%	5.94%		
After-Tax Annual Arith. Return	5.64%	6.98%	5.68%	6.48%
After-Tax Annual Geom. Return	4.96%	5.86%		
Standard Deviation (Risk)	12.02%	15.58%	8.47%	12.16%
Sharpe Ratio	0.47	0.45	0.67	0.53
After-Tax Yield	2.49%	1.77%	2.89%	2.08%

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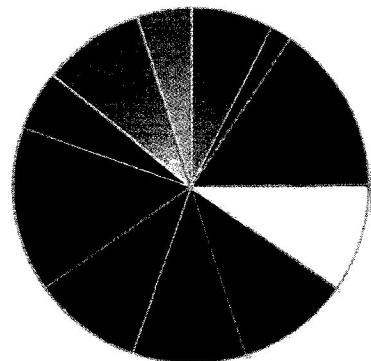
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Asset Mix Comparison - Composite Assets

Present Asset Mix



Proposed Asset Mix



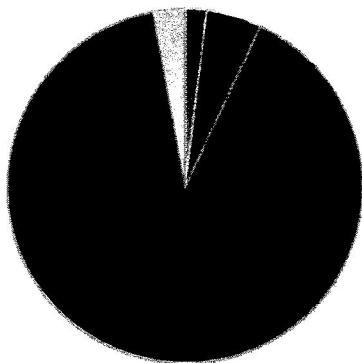
		Present Asset Mix	Proposed Asset Mix	Adjustment
■ Cash Equivalents	\$22,334	1.94%	\$85,712	7.43% \$63,378
▼ Inter-Term Govt Bond	\$13,098	1.14%	\$0	0.00% (\$13,098)
■ Long-Term Govt Bond	\$0	0.00%	\$22,196	1.92% \$22,196
■ High Yield Bonds	\$44,663	3.87%	\$0	0.00% (\$44,663)
■ Large Value Stocks	\$80,297	6.96%	\$177,270	15.36% \$96,973
Large Growth Stocks	\$20,750	1.80%	\$114,176	9.90% \$93,426
■ Small Value Stocks	\$99,564	8.63%	\$119,569	10.36% \$20,005
■ Small Growth Stocks	\$69,770	6.05%	\$119,569	10.36% \$49,799
■ Mid Cap Stocks	\$0	0.00%	\$115,437	10.00% \$115,437
■ Foreign Developed Stocks	\$110,237	9.55%	\$173,139	15.01% \$62,902
■ Emerging Market Stocks	\$0	0.00%	\$61,868	5.36% \$61,868
■ Balanced Funds	\$659,525	57.16%	\$0	0.00% (\$659,525)
■ Real Estate	\$33,574	2.91%	\$107,140	9.29% \$73,566
■ Venture Capital/L.P.	\$0	0.00%	\$57,736	5.00% \$57,736
Total	\$1,153,812	100.00%	\$1,153,812	100.00%
Before-Tax Annual Arith. Return		5.74%		7.09%
Before-Tax Annual Geom. Return		5.04%		5.94%
After-Tax Annual Arith. Return		5.64%		6.98%
After-Tax Annual Geom. Return		4.96%		5.86%
Standard Deviation (Risk)		12.02%		15.58%
Sharpe Ratio		0.47		0.45
After-Tax Yield		2.49%		1.77%

This is for illustrative purposes only. Past performance is not an indication of future returns.

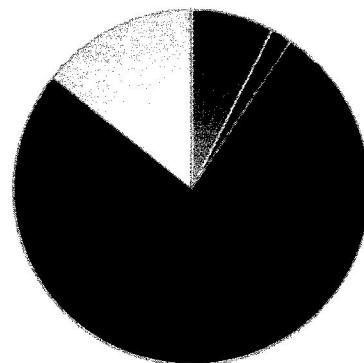
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Broad Asset Mix Comparison - Composite Assets

Present Asset Mix



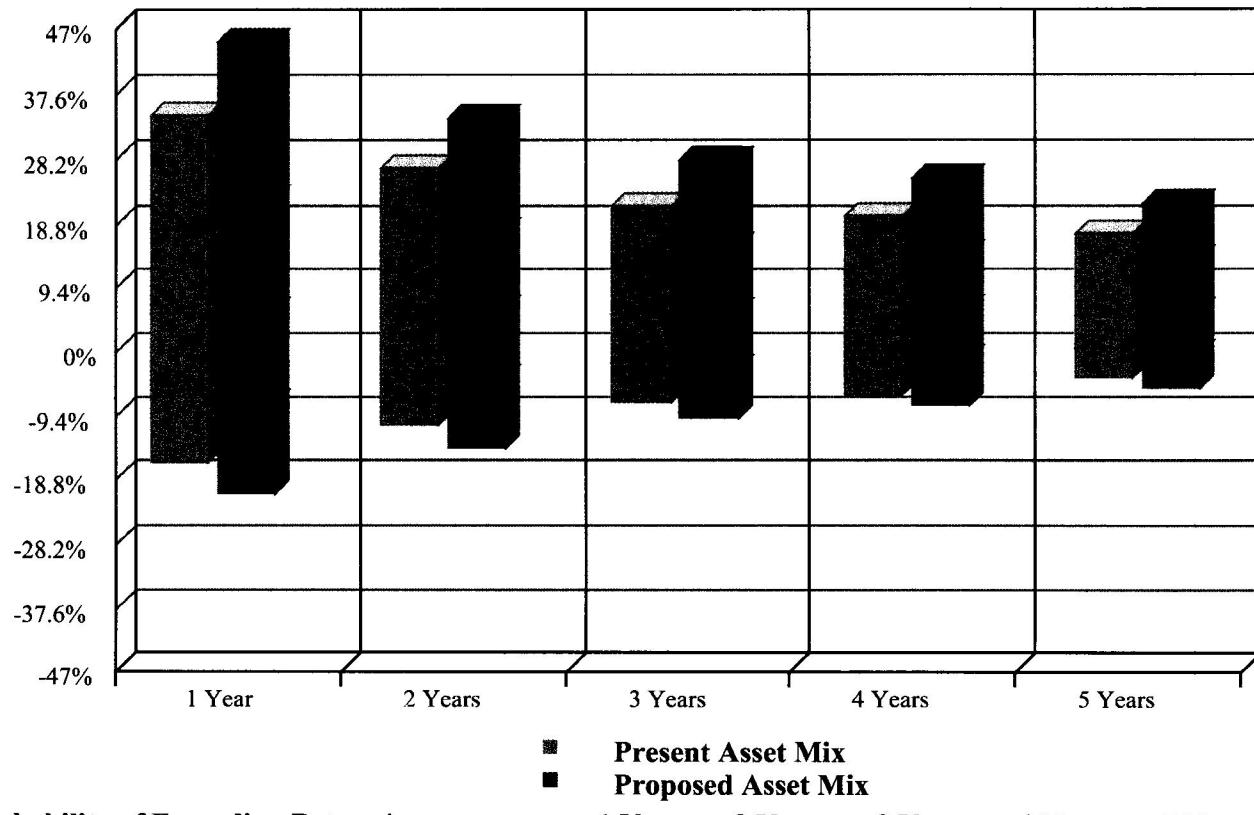
Proposed Asset Mix



	Present Asset Mix	Proposed Asset Mix	Adjustment
Cash and Equivalents	\$22,334	1.94%	\$63,378
Fixed Income	\$57,761	5.01%	(\$35,565)
Equities	\$1,040,143	90.15%	(\$159,114)
Alternatives	\$33,574	2.91%	\$131,302
Total	\$1,153,812	100.00%	100.00%
Before-Tax Annual Arith. Return		5.74%	7.09%
Before-Tax Annual Geom. Return		5.04%	5.94%
After-Tax Annual Arith. Return		5.64%	6.98%
After-Tax Annual Geom. Return		4.96%	5.86%
Standard Deviation (Risk)		12.02%	15.58%
Sharpe Ratio		0.47	0.45
After-Tax Yield		2.49%	1.77%

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Simulation Analysis - Range of Returns (After-Tax)



Probability of Exceeding Return*	Probability of Exceeding Return*				
	1 Year	2 Years	3 Years	4 Years	5 Years
Present					
2%	34.0%	26.4%	20.8%	19.3%	16.7%
16%	17.4%	14.0%	11.8%	11.0%	10.7%
50%	5.2%	5.0%	4.9%	4.9%	4.8%
84%	-6.2%	-3.3%	-2.0%	-0.7%	-0.2%
98%	-16.6%	-11.4%	-8.1%	-6.9%	-4.4%
Proposed					
2%	44.4%	33.7%	27.5%	24.8%	21.2%
16%	21.9%	17.2%	14.8%	13.7%	13.2%
50%	5.4%	5.9%	5.6%	5.7%	5.4%
84%	-8.0%	-4.5%	-2.8%	-1.4%	-0.7%
98%	-21.3%	-14.5%	-10.3%	-8.5%	-5.8%

* The Probability of Exceeding Return column shows the likelihood of exceeding the after-tax compound returns shown in the Time Horizons. For example, in the Proposed Portfolio, there is a 2% likelihood of exceeding 44.4% and a 98% likelihood of exceeding -21.3% when all simulated returns are considered at 1 Year.

The simulated range of annualized compound returns for the Present and Proposed Composite Asset Mixes are shown over the projection period. The expected ranges of returns are represented by the bars. There is a 98% chance of realizing a return that is greater than the simulated worst case return. And, there is a 2% chance of exceeding the simulated best case return. The expected range of returns narrows over longer time periods and for more conservative portfolios. PLEASE REFER TO THE MONTE CARLO SIMULATION METHODOLOGY PRINTED REPORT PAGE FOR MORE INFORMATION REGARDING THE METHODOLOGY, LIMITATIONS AND KEY ASSUMPTIONS OF MONTE CARLO SIMULATION.

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Client Data Inputs

K [REDACTED]

Federal Income Tax Rate: 28.00%
State Income Tax Rate: 3.07%
Federal Capital Gains Tax Rate: 15.00%
State Capital Gains Tax Rate: 3.07%
Medicare Tax Rate: 3.80%

Future Federal Income Tax Rate: 28.00%
Future State Income Tax Rate: 3.07%
Future Federal Capital Gains Tax Rate: 15.00%
Future State Capital Gains Tax Rate: 3.07%
Future Medicare Tax Rate: 3.80%

Starting Year: 2019

Investment Account -

Institution:

Account number: [REDACTED]

Description: [REDACTED]

Current value*: \$82,597

Cost Basis: \$20,020

Symbol	Description	Asset Class	Tax Type	Current Value	% of Total	Cost Basis	Hold
OILGX	Opt. Large Cap Grow	Large Growth Stocks	Taxed	\$20,750	25.12%	\$5,627	No
OILVX	Opt Large Cap Value	Large Value Stocks	Taxed	\$18,603	22.52%	\$5,482	No
OISGX	Opt. Small Mid Cap	Small Growth Stocks	Taxed	\$7,384	8.94%	\$946	No
OISVX	Opt Small Mid Value	Small Value Stocks	Taxed	\$6,311	7.64%	\$761	No
OIIEX	Opt International Fd	Foreign Developed Stocks	Taxed	\$14,475	17.52%	\$2,024	No
OIFIX	Opt Fixed Income Fd	Inter-Term Govt Bond	Taxed	\$13,098	15.86%	\$2,530	No
	Insured Cash Account	Cash Equivalents	Taxed	\$1,976	2.39%	\$2,650	No

Retirement Account -

Institution:

Account number: [REDACTED]

Description: [REDACTED]

Current value*: \$425,552

Cost Basis: \$205,421

Symbol	Description	Asset Class	Type	Tax Type	Current Value	% of Total	Cost Basis	Hold
KMI	Kinder Morgan Inc Del	Large Value Stocks	401(k)	Deferred (Pre-Tax)	\$2,667	0.63%	\$5,471	No
JATTX	Janus Triton T	Small Growth Stocks	401(k)	Deferred (Pre-Tax)	\$62,386	14.66%	\$37,374	No
HRVIX	Heartland Value Plus	Small Value Stocks	401(k)	Deferred (Pre-Tax)	\$34,213	8.04%	\$26,856	No
JSCVX	Janus Perkins SCV	Small Value Stocks	401(k)	Deferred (Pre-Tax)	\$59,040	13.87%	\$29,793	No

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JNBSX	JP Morgan Inc Build	Balanced Funds	401(k)	Deferred (Pre-Tax)	\$23,200	5.45%	\$19,239	No
SGIIX	First Eagle Global	Foreign Developed Stocks	401(k)	Deferred (Pre-Tax)	\$32,045	7.53%	\$18,784	No
EVIBX	EV Income of Boston	High Yield Bonds	401(k)	Deferred (Pre-Tax)	\$26,969	6.34%	\$14,434	No
IVHIX	Ivy High Income	High Yield Bonds	401(k)	Deferred (Pre-Tax)	\$17,694	4.16%	\$19,324	No
	Money Fund JPR	Cash Equivalents	401(k)	Deferred (Pre-Tax)	\$19,503	4.58%	\$34,146	No
EDIAK	Eaton Vance Global Income Builder A	Foreign Developed Stocks	401(k)	Deferred (Pre-Tax)	\$63,717	14.97%	\$0	No
NBHIX	Neuberger Berman Equity Income Inst	Large Value Stocks	401(k)	Deferred (Pre-Tax)	\$59,027	13.87%	\$0	No
CMNIX	Calamos Mrkt Ntrl	Balanced Funds	401(k)	Deferred (Pre-Tax)	\$25,091	5.9%	\$0	No

Retirement Account -

Institution:

Account number:

Description:

Current value*: \$611,234

Cost Basis: \$0

Symbol	Description	Asset Class	Type	Tax Type	Current Value	% of Total	Cost Basis	Hold
VTWNX	Vanguard Target Retirement 2020 Inv	Balanced Funds	401(k)	Deferred (Pre-Tax)	\$611,234	100%	\$0	No

Retirement Account -

Institution:

Account number:

Description:

Current value*: \$34,429

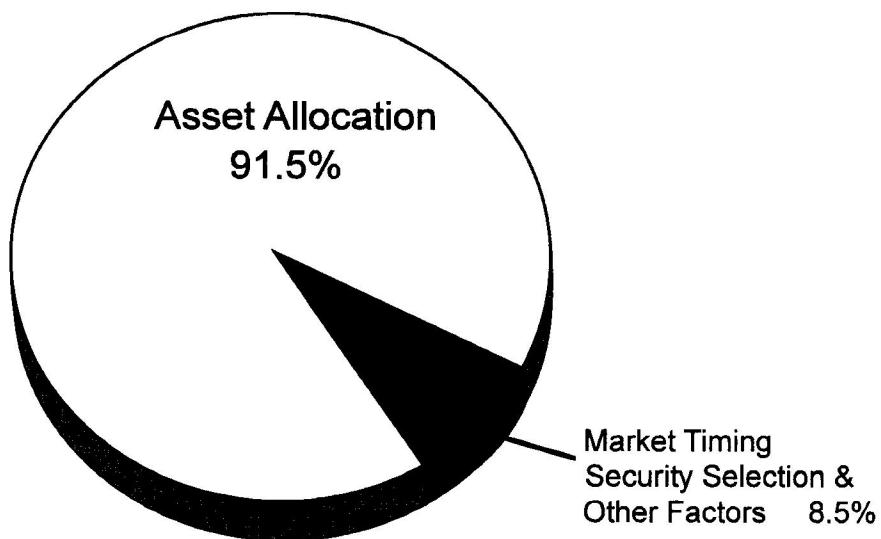
Cost Basis: \$0

Symbol	Description	Asset Class	Type	Tax Type	Current Value	% of Total	Cost Basis	Hold
	Insured Cash Account	Cash Equivalents	401(k)	Deferred (Pre-Tax)	\$855	2.48%	\$0	No
WPC	W P Carey Co LLC	Real Estate	401(k)	Deferred (Pre-Tax)	\$33,574	97.52%	\$0	No

*The amount shown includes only those assets that have been assigned to an asset class.

Importance of Asset Allocation

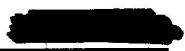
Asset allocation policy is the main determinant of portfolio total return.



A 1991 study by Brinson, Singer and Beebower investigated the determinants of portfolio performance.¹ By studying the quarterly returns of 82 pension plans over a 10-year period, they concluded that:

- The selection of which asset classes to invest in and how much to invest in each explained 91.5% of the variation in the plans' returns.
- The combination of market timing, security selection and other factors accounted for only 8.5% of the differences in the plans' returns.

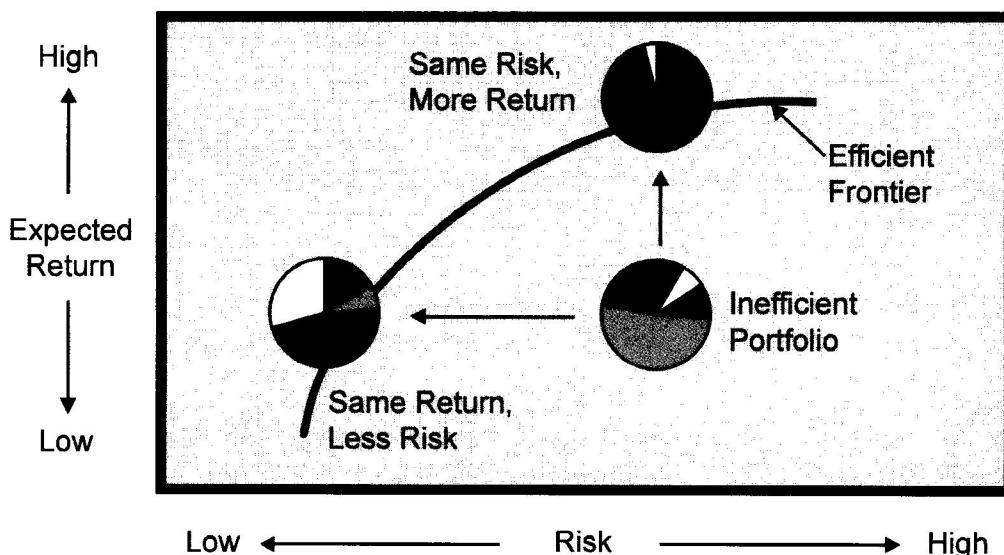
¹ Brinson, G.P., Singer, B.D. and G.L. Beebower, "Determinants of Portfolio Performance II: An Update", Financial Analysts Journal, May-June 1991.



The Efficient Frontier

The Efficient Frontier traces out hypothetical portfolios that offer the greatest amount of return for given levels of risk. All portfolios on the frontier are "efficient" and selection of the proper portfolio depends upon the investor's goals and tolerance for risk.

The diagram below illustrates the concept of efficiency. The "Inefficient Portfolio" does not lie on the frontier because an alternate portfolio can be found that offers more return for the same amount of risk. A second portfolio can be found that offers the same return, but less risk. Both of these "efficient" portfolios are more desirable to investors trying to maximize return and minimize risk.



When calculating the Efficient Frontier, multiple factors are considered:

- Market expectations for return, risk, and correlation of returns
- Constraints limiting investment in particular asset classes
- Your tax rates

Portfolio optimization is a mathematical technique used in attempting to identify portfolios that lie along the Efficient Frontier. These ideas were developed by Dr. Harry Markowitz and earned him a Nobel Prize in Economics in 1990. These theories are collectively known as Modern Portfolio Theory.



Monte Carlo Simulation Methodology

Introduction

Monte Carlo Simulation is a technique for simulating real-world situations that involve elements of uncertainty. Assumed values for uncertain variables are generated over and over to simulate the range of real-world possibilities.

Monte Carlo Simulation is named after Monte Carlo, Monaco, where the primary attractions are casinos containing games of chance. Games of chance exhibit random behavior. Monte Carlo Simulation selects variable values for a simulation model in a fashion similar to the random behavior exhibited in games of chance.

How Monte Carlo Simulation Works

Monte Carlo Simulation refers to a mathematical analysis meant to imitate reality in order to determine the likelihood of a particular result or set of results. This type of analysis is especially useful if the situation contains elements of uncertainty that are difficult or too mathematically complex to reproduce. A Monte Carlo Simulation is produced by projecting a situation many times and then measuring the number of simulations resulting in particular outcomes. This analysis will not help you "beat" the market.

Asset Analysis

Monte Carlo Simulation (tool) provides information on the likelihood that your assets will last through retirement. The tool simulates different rates of return to be used over your retirement period to more accurately reflect the volatility in rates of return that you may experience on your assets over time. The tool will insert a different rate of return for each year (or month-depending on the tool) during your pre-retirement and/or retirement period. The expected rate of return is based on your current, overall asset allocation and assumes annual rebalancing.

The tool will replicate this process hundreds or thousands of times and will tally how many times your assets last through your retirement period and how many times they did not. For each of the simulations, if the assets had a balance greater than zero at the end of the period, the tool will count this particular simulation as a "success". If there was a zero or negative balance then the tool will count this as a "failure". All "successes" are tabulated and compared against the "failures" to give you a percentage or probability that your assets will last through retirement. For example, if there were 300 "failures" and 700 "successes", then the probability of your assets lasting over your retirement period would be 70%.

Analysis of Rate of Return

Another component of the report is an analysis to calculate the likelihood that you will achieve the expected target rate of return as identified in your initial scenario. For example, if you stated, on average, that you expect a 6% rate of return, the tool will perform the same analysis as identified

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above and will tally how many times your portfolio had an expected average rate of return of 6% or greater. This would be counted as a "success". In addition, in the hundreds or thousands of Monte Carlo Simulations performed, if the tool recorded 650 instances when the expected average rate of return was 6% or greater and recorded 350 instances when the expected average rate of return was below 6%, then the probability of your average rate of return achieving your target return (6%) would be 65%.

Use of Standard Deviation and Correlations

Standard Deviation is an important concept in understanding Monte Carlo Simulation. Standard Deviation for an Asset Class represents its estimated average annual investment risk during each year of the projection period. It measures the potential magnitude of any positive over-performance or negative under-performance of an Asset Class from its Expected Return. The higher the standard deviation, the wider the range of returns possible in any one year. Assuming a normal bell curve for returns, two standard deviations represent approximately 95% of possible outcomes. In this analysis, the Monte Carlo Simulation always assumes the maximum of two standard deviations; therefore, results will vary from the report approximately 5% of the time. As with any portfolio allocation, there is a risk that the estimated rate of return is higher or lower than that estimated, based on the approximate 4% excluded from the analysis.

Standard Deviation

The tool randomly selects rates of return based on a range of returns using both the expected total rate of return and the standard deviation (risk) for each asset class that you own in your portfolio. The tool uses the data listed on the "Efficient Frontier – Proposed Asset Classes" page to perform the calculations.

Correlations

Correlations are also used in the tool and compares assets to one another. The Correlations measure the degree of relationship between two Asset Classes and are a standardized measure which can be between -1.00 and +1.00.

Interpreting Correlations

- Perfectly Positively Correlated: The Correlation is +1.00. The returns of two Asset Classes move exactly in lock-step with one another.
- Perfectly Negatively Correlated: The Correlation is -1.00. The returns of two Asset Classes move in exactly opposite directions from one another.
- Uncorrelated: The Correlation is 0.00. Two Asset Classes have no relationship between the movement of their returns.



Assumptions

In order to perform the simulations, the tool must have a beginning basis for factors that affect your situation. The specifics of your situation have been entered in the analysis data you provided and include, but are not limited to, historical market returns, standard deviation (risk), withdrawal amounts, contribution amounts, retirement periods, and income and expense estimates.

Monte Carlo Simulation's Use of Asset Classes

The Monte Carlo Simulation calculations are based on asset classes rather than specific securities or investments. Each security is categorized under an assigned asset class and that asset class has a corresponding index. This index is used to view historical performance and standard deviation (risk) characteristics, as well as, in any estimates for future possible performance and standard deviation (risk) characteristics.

Monte Carlo Simulation's Asset Class Assumptions

The asset class assumptions used in the Monte Carlo Simulation are located on the Scenario Assumptions page in the printed report. The key elements in determining Asset Class Capital Market Assumptions include, but are not limited to, quarterly reviews of the markets, expected future results based loosely on historical performance, quarterly reviews by analytical people who are close to the industry and understand portfolio modeling techniques, historical data contained in our Index Histories Database, etc.

Limitations

The average outcome is the outcome with the highest specific probability; however, averages can be misleading. For example, assume it takes an average of 30 minutes to get to the airport gate. If you leave for the gate just 30 minutes before takeoff, you'll miss your plane half of the time!

Changes in Your Financial Situation May Vary these Results

Since Monte Carlo Simulation is based on a number of factors which you provided, if your financial situation changes, the results of the report may vary. For instance, if your asset allocation changes, the simulation results may also change because asset allocation is a primary factor in the analysis. In addition, if you change any other factor relied upon for the simulation such as your expected target rate of return, withdrawal(s), income, or expenses, your results may vary.

IMPORTANT: The projections or other information generated by the Monte Carlo Simulation tool regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results.

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Product Selection

The Monte Carlo Simulation (tool) calculations are based on asset classes rather than specific securities or investments. The tool does not provide preferential treatment to any specific security or investment.

Conclusion

Statistics tell us that if you flip a coin, the probability is 1 out of 2 (50%) that the coin will land heads up. A simulation analysis could be performed that flips the coin many times. The results of such an analysis would confirm that the probability of heads is 50%.

With the roll of the dice, a simulation analysis might be used to determine the probability of rolling any number between 2 and 12 on a set of dice. The results should show that the probability of rolling a 7 is 6 out of 36 or 16.67% and the probability of rolling a 2 is 1 out of 36 or 2.78%.

These examples illustrate applications of a simulation analysis where the results are known based on statistics. Your financial future is less predictable because many factors are involved. A simulation analysis helps illustrate and measure possible financial futures and measure the probability of achieving them; therefore, providing clients information on their retirement situation.

If you have questions about this report, please contact your financial advisor.