

Wealth Strategies Analysis

Prepared on May 11th, 2023
for CSU Foundation

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The Wealth Strategies Analysis is broken into multiple sections and sub-sections. The sub-sections are designed to stand alone or may be combined with other sub-sections to provide a more complete picture of financial health.

SECTION	SUB-SECTION	DESCRIPTION	ASSUMPTIONS
Linear Growth Analysis	Assumptions and Asset Allocations	An overview of various portfolios and cash considerations along with risk and return assumptions.	Returns: Morgan Stanley's forecasts Output: Gross of cash inflows, cash outflows and advisory fees
	Expected Performance over Time	A linear illustration of how wealth evolves over time assuming that portfolios achieve their annual return assumption each year. There is no guarantee that these assumptions will be achieved.	Returns: Morgan Stanley's forecasts Output: Net of cash inflows, cash outflows and advisory fees
Monte Carlo Analysis	Hypothetical Performance	An analysis of the range of results that various portfolios may achieve over time.	Returns: Morgan Stanley's forecasts Output: Net of cash inflows, cash outflows and advisory fees
	Hypothetical Estate Tax Transfer	A breakout of how an estate may be divided should the client pass away at various points in time.	Returns: Morgan Stanley's forecasts Output: Net of cash inflows, cash outflows and advisory fees
	Probability of Success	A summary of the chances that various portfolios achieve certain goals.	Returns: Morgan Stanley's forecasts Output: Net of cash inflows, cash outflows and advisory fees
Historical Analysis	Historical Performance	A report of the historical blended returns for various portfolios based upon asset classes using indices as proxies.	Returns: Historical Output: Gross of cash inflows, cash outflows and advisory fees
	Contribution to Risk and Return	A representation of how much each asset class contributed to historical risk and return for various portfolios.	Returns: Historical Output: Gross of cash inflows, cash outflows and advisory fees
	Market Scenarios	A hypothetical illustration of how various portfolios would have performed historically given a specific market scenario.	Returns: Historical Output: Gross of cash inflows, cash outflows and advisory fees
	Historical Scenarios	A hypothetical illustration of how various portfolios would have performed historically given a specific historical scenario.	Returns: Historical Output: Gross of cash inflows, cash outflows and advisory fees

1. Important: The projections or other information generated by the Wealth Strategies Analysis 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. Results generated by a Monte Carlo analysis will vary with each use and over time because each portfolio simulation is randomly generated. See the Appendix for assumptions, asset class inputs, a glossary of terms, a description of the risks and disclosures.
2. For use only in one-on-one presentations.

Summary

Portfolios	Value	Details		
CSU Foundation	\$38,000,000			

Cash Outflows	Amount	Time Period	Distributing Portfolio	Details
Annual spend		2023-2042	CSU Foundation	0 % at previous year outflow, 100 % at 4 % of portfolio value averaged over 3 years.

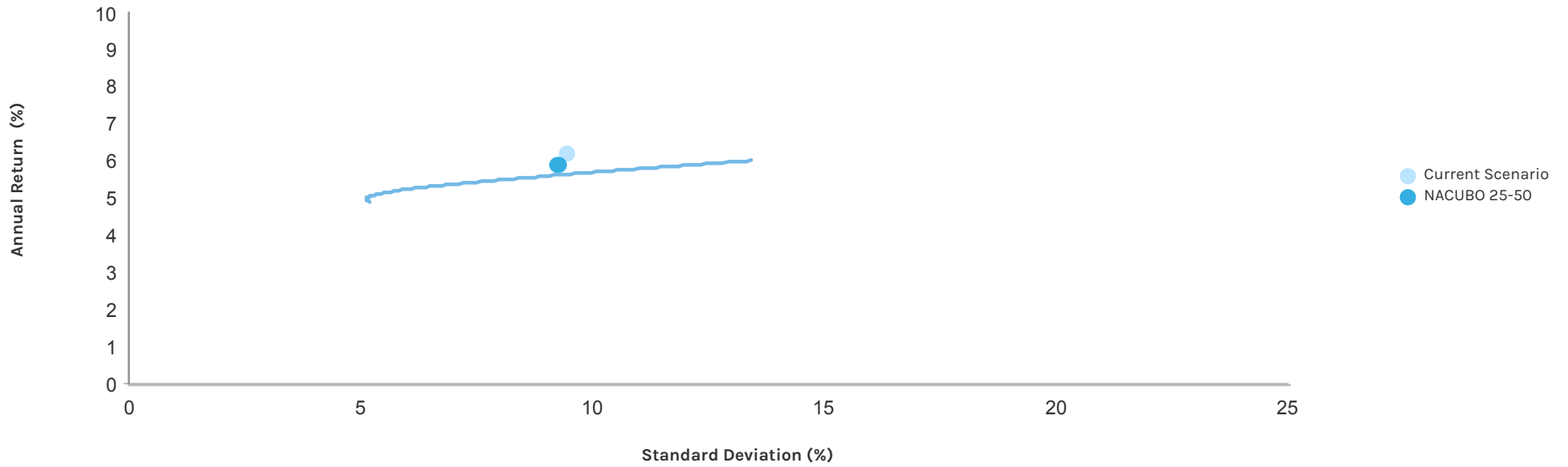
1. The portfolios above are constructed using indices as proxies. Indices are unmanaged. It is not possible to invest directly in an index. Asset allocation does not assure a profit or protect against loss.
2. Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
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Summary

	Current Scenario	NACUBO 25-50
Cash	0.0%	3.0%
Equities	55.0%	58.0%
Global Equities	55.0%	58.0%
Fixed Income & Preferreds	20.0%	22.0%
US Fixed Income Taxable	20.0%	22.0%
Alternatives	25.0%	17.0%
Real Assets	0.0%	3.0%
Absolute Return Assets	5.0%	7.0%
Equity Hedge Assets	5.0%	0.0%
Private Investments	15.0%	7.0%
Private Real Estate	5.0%	2.0%
Private Equity	10.0%	5.0%
Strategic Assumptions		
Annual Return	6.2%	5.9%
Standard Deviation	9.5%	9.3%
Sharpe Ratio	0.26	0.23
Annual Yield	2.4%	2.6%
Probability of Positive Return	75.2%	74.8%
Secular Assumptions		
Annual Return	8.0%	7.5%
Standard Deviation	9.5%	9.3%
Sharpe Ratio	0.52	0.47
Annual Yield	2.3%	2.4%
Probability of Positive Return	79.9%	79.0%

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2. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
3. Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
4. Please refer to the Return Assumptions page of the appendix to view an important and relevant disclosure regarding return rates and fees.
5. For use only in one-on-one presentations.

Summary



Current Scenario

NACUBO 25-50

Strategic Assumptions

	Current Scenario	NACUBO 25-50
Annual Return	6.2%	5.9%
Standard Deviation	9.5%	9.3%
Sharpe Ratio	0.26	0.23
Annual Yield	2.4%	2.6%

1. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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Expected Performance Over Time

Summary: 2023 - 2032

Current Scenario	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Beginning Assets	38,000,000	38,923,676	39,846,710	40,756,755	41,686,386	42,636,737	43,608,725	44,602,864	46,442,444	48,379,107
Interest and Dividends	900,697	922,590	944,468	966,039	988,073	1,010,599	1,033,638	1,011,724	1,053,451	1,097,380
Capital Appreciation	1,451,954	1,487,247	1,522,516	1,557,288	1,592,808	1,629,121	1,666,260	2,572,500	2,678,599	2,790,298
Cash Inflows	0	0	0	0	0	0	0	0	0	0
Cash Outflows	(1,428,975)	(1,486,803)	(1,556,938)	(1,593,695)	(1,630,531)	(1,667,732)	(1,705,758)	(1,744,644)	(1,795,387)	(1,858,992)
Annual spend	(1,428,975)	(1,486,803)	(1,556,938)	(1,593,695)	(1,630,531)	(1,667,732)	(1,705,758)	(1,744,644)	(1,795,387)	(1,858,992)
Fees	0	0	0	0	0	0	0	0	0	0
Ending Assets	38,923,676	39,846,710	40,756,755	41,686,386	42,636,737	43,608,725	44,602,864	46,442,444	48,379,107	50,407,792

NACUBO 25-50

Beginning Assets	38,000,000	38,810,236	39,611,901	40,393,801	41,189,859	42,001,097	42,828,282	43,671,751	45,236,327	46,875,201
Interest and Dividends	975,469	996,268	1,016,846	1,036,918	1,057,353	1,078,178	1,099,412	1,034,805	1,071,878	1,110,711
Capital Appreciation	1,263,743	1,290,688	1,317,349	1,343,352	1,369,826	1,396,805	1,424,314	2,243,119	2,323,481	2,407,658
Cash Inflows	0	0	0	0	0	0	0	0	0	0
Cash Outflows	(1,428,975)	(1,485,291)	(1,552,295)	(1,584,213)	(1,615,941)	(1,647,797)	(1,680,256)	(1,713,348)	(1,756,485)	(1,810,444)
Annual spend	(1,428,975)	(1,485,291)	(1,552,295)	(1,584,213)	(1,615,941)	(1,647,797)	(1,680,256)	(1,713,348)	(1,756,485)	(1,810,444)
Fees	0	0	0	0	0	0	0	0	0	0
Ending Assets	38,810,236	39,611,901	40,393,801	41,189,859	42,001,097	42,828,282	43,671,751	45,236,327	46,875,201	48,583,128

1. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
2. Please refer to the Return Assumptions page of the appendix to view an important and relevant disclosure regarding return rates and fees.
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Expected Performance Over Time

Summary: 2033 - 2042 (Continued)

Current Scenario	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Beginning Assets	50,407,792	52,522,101	54,725,251	57,020,827	59,412,700	61,904,905	64,501,651	67,207,324	70,026,493	72,963,918
Interest and Dividends	1,143,397	1,191,356	1,241,329	1,293,400	1,347,655	1,404,185	1,463,087	1,524,459	1,588,407	1,655,036
Capital Appreciation	2,907,303	3,029,248	3,156,316	3,288,715	3,426,667	3,570,407	3,720,176	3,876,228	4,038,825	4,208,243
Cash Inflows	0	0	0	0	0	0	0	0	0	0
Cash Outflows	(1,936,391)	(2,017,453)	(2,102,069)	(2,190,242)	(2,282,117)	(2,377,846)	(2,477,590)	(2,581,518)	(2,689,806)	(2,802,636)
Annual spend	(1,936,391)	(2,017,453)	(2,102,069)	(2,190,242)	(2,282,117)	(2,377,846)	(2,477,590)	(2,581,518)	(2,689,806)	(2,802,636)
Fees	0	0	0	0	0	0	0	0	0	0
Ending Assets	52,522,101	54,725,251	57,020,827	59,412,700	61,904,905	64,501,651	67,207,324	70,026,493	72,963,918	76,024,561

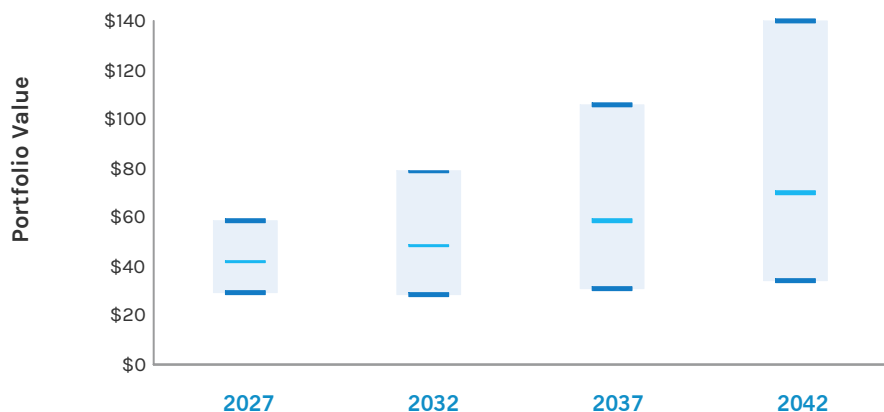
NACUBO 25-50

Beginning Assets	48,583,128	50,353,763	52,189,066	54,091,272	56,062,813	58,106,214	60,224,093	62,419,165	64,694,245	67,052,247
Interest and Dividends	1,151,181	1,193,136	1,236,624	1,281,697	1,328,413	1,376,831	1,427,014	1,479,027	1,532,935	1,588,808
Capital Appreciation	2,495,383	2,586,328	2,680,595	2,778,299	2,879,563	2,984,519	3,093,300	3,206,046	3,322,901	3,444,015
Cash Inflows	0	0	0	0	0	0	0	0	0	0
Cash Outflows	(1,875,929)	(1,944,161)	(2,015,013)	(2,088,455)	(2,164,575)	(2,243,471)	(2,325,242)	(2,409,993)	(2,497,833)	(2,588,875)
Annual spend	(1,875,929)	(1,944,161)	(2,015,013)	(2,088,455)	(2,164,575)	(2,243,471)	(2,325,242)	(2,409,993)	(2,497,833)	(2,588,875)
Fees	0	0	0	0	0	0	0	0	0	0
Ending Assets	50,353,763	52,189,066	54,091,272	56,062,813	58,106,214	60,224,093	62,419,165	64,694,245	67,052,247	69,496,195

1. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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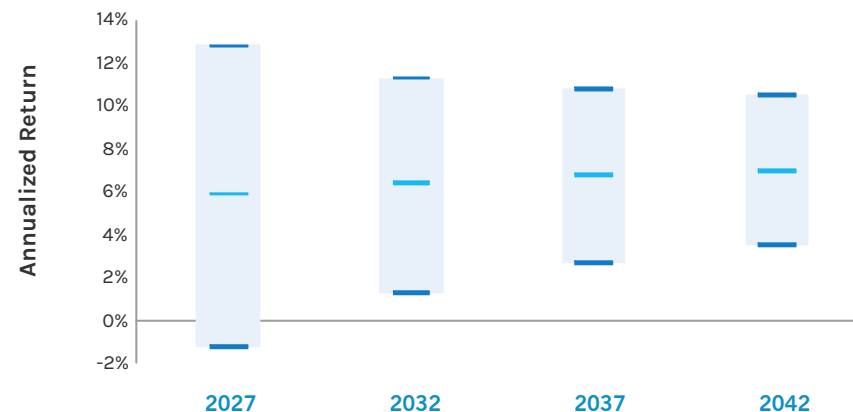
Current Scenario: 2023-2042

Portfolio Value Over Time (MM)



Portfolio Value				
95th Percentile	\$58.8	\$78.6	\$105.6	\$139.9
50th Percentile	\$42.0	\$48.4	\$58.5	\$69.8
5th Percentile	\$29.0	\$28.7	\$31.0	\$34.2

Annualized Return Over Time

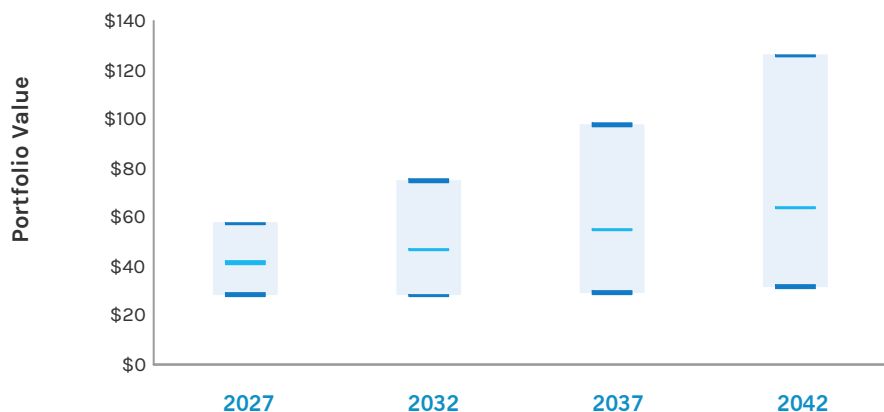


Annualized Return				
95th Percentile	12.8%	11.3%	10.8%	10.5%
50th Percentile	5.9%	6.4%	6.8%	7.0%
5th Percentile	-1.2%	1.3%	2.7%	3.5%

- Portfolio value is shown net of cash inflows, cash outflows and advisory fees. Annualized return is shown gross of cash inflows, cash outflows and advisory fees.
- Portfolio values reflect the future value of the portfolios. Annualized returns reflect nominal growth of the portfolios.
- This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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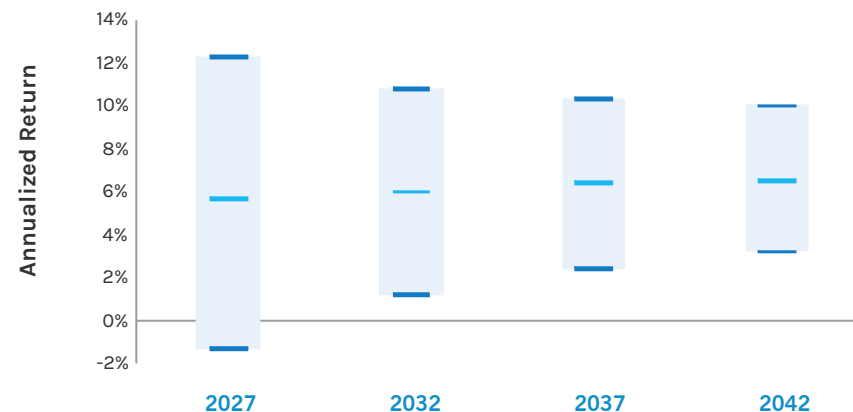
NACUBO 25-50: 2023-2042

Portfolio Value Over Time (MM)



Portfolio Value				
95th Percentile	\$57.4	\$75.0	\$97.8	\$125.8
50th Percentile	\$41.5	\$46.8	\$55.0	\$63.9
5th Percentile	\$28.8	\$28.1	\$29.5	\$31.8

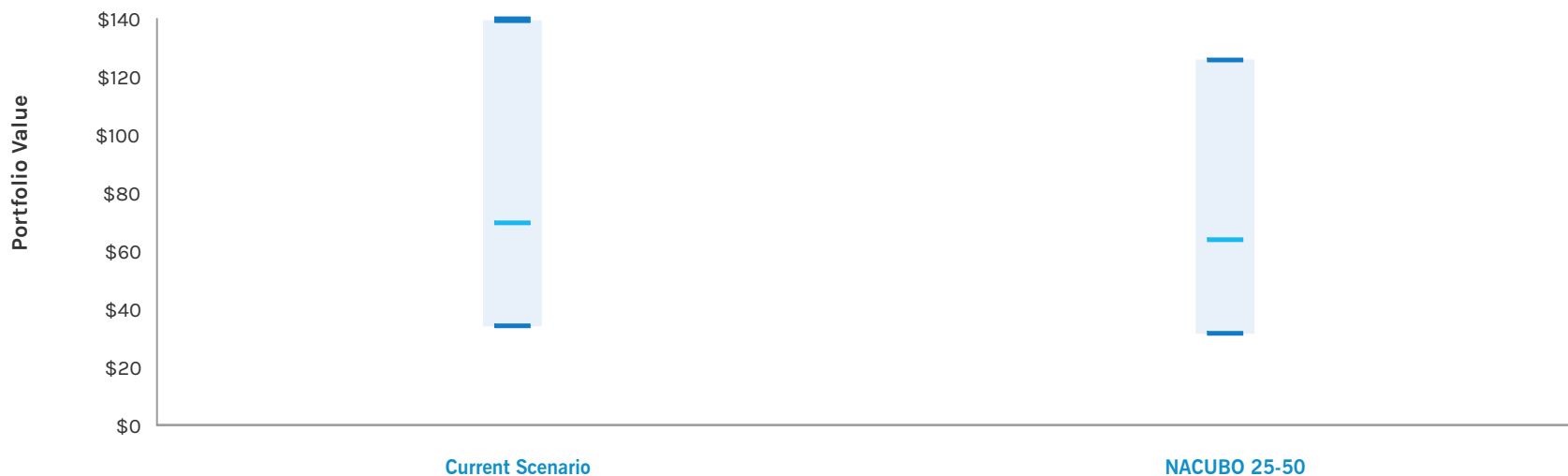
Annualized Return Over Time



Annualized Return				
95th Percentile	12.3%	10.8%	10.3%	10.0%
50th Percentile	5.7%	6.0%	6.4%	6.5%
5th Percentile	-1.3%	1.2%	2.4%	3.2%

1. Portfolio value is shown net of cash inflows, cash outflows and advisory fees. Annualized return is shown gross of cash inflows, cash outflows and advisory fees.
2. Portfolio values reflect the future value of the portfolios. Annualized returns reflect nominal growth of the portfolios.
3. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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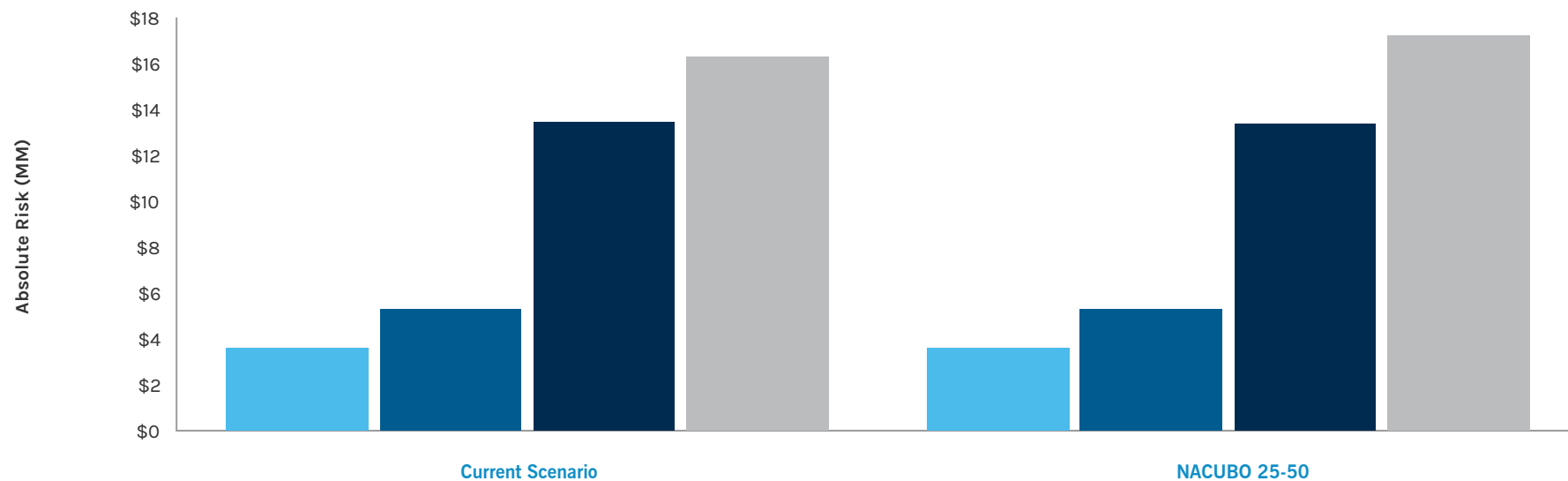
Summary: Year 2042



Portfolio Value		
95th Percentile	\$139.9	\$125.8
50th Percentile	\$69.8	\$63.9
5th Percentile	\$34.2	\$31.8
Annualized Return		
95th Percentile	10.5%	10.0%
50th Percentile	7.0%	6.5%
5th Percentile	3.5%	3.2%

1. Portfolio value is shown net of cash inflows, cash outflows, taxes and advisory fees. Annualized return is shown gross of cash inflows, cash outflows and advisory fees.
2. Portfolio values reflect the future value of the portfolios. Annualized growth rates reflect nominal growth of the portfolios.
3. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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Summary



Dollar Risk (MM)

Value at Risk	\$3.6	\$3.6
Expected Tail Loss	\$5.3	\$5.3
Worst Trial	\$13.5	\$13.4
Max Drawdown	\$16.3	\$17.2

Percentage Risk

Value at Risk	9.4%	9.5%
Expected Tail Loss	14.0%	13.8%
Worst Trial	35.4%	35.2%
Max Drawdown	42.9%	45.2%

1. Portfolio risk is shown gross of cash inflows, cash outflows and advisory fees.
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Summary

Average Annual Distribution

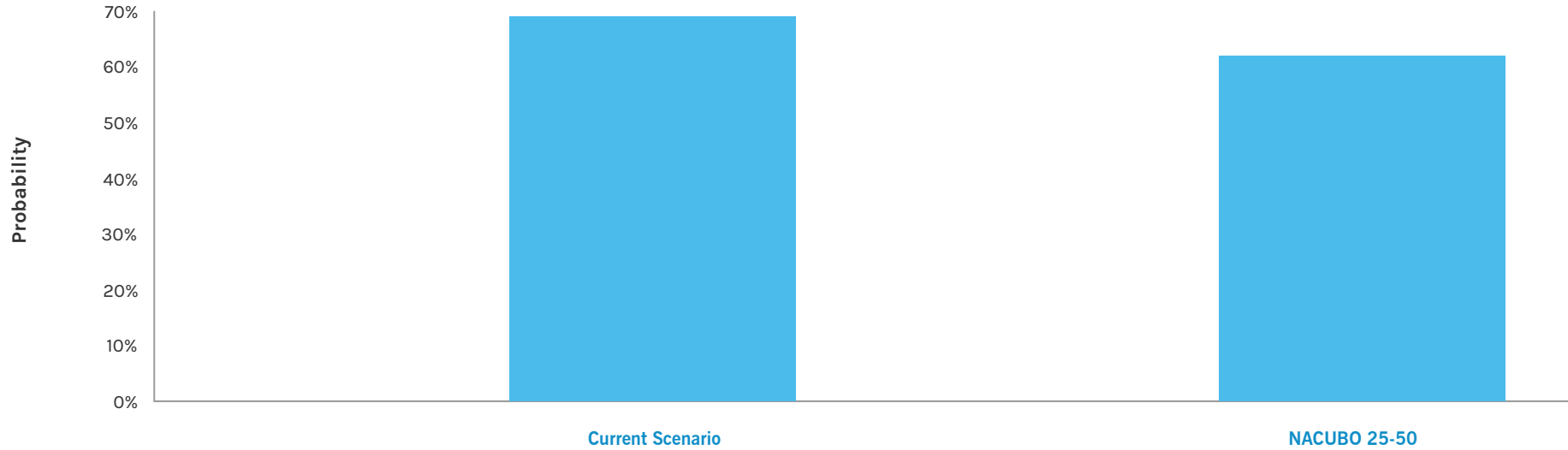


Dollar Distribution (K)		
95th Percentile	\$2,883.9	\$2,748.4
50th Percentile	\$1,937.6	\$1,868.5
5th Percentile	\$1,312.3	\$1,283.6
Percentage Distribution		
95th Percentile	4.0%	4.0%
50th Percentile	3.9%	3.9%
5th Percentile	3.8%	3.8%

- Portfolio values reflect the future value of the portfolios. Annualized growth rates reflect nominal growth of the portfolios.
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Summary: Year 2042

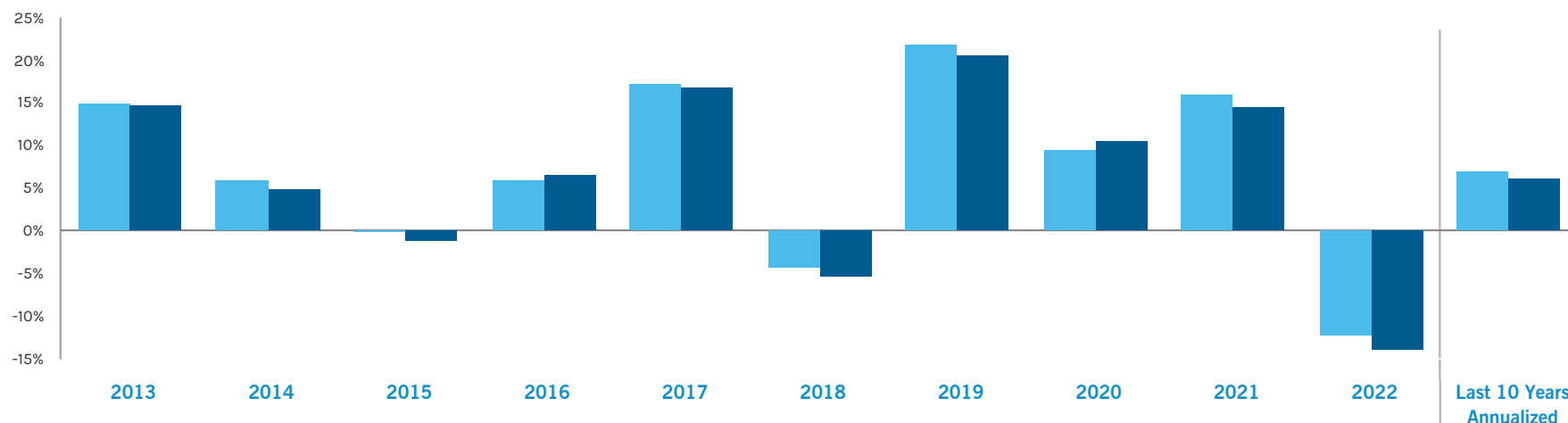
Probability of Achieving Goals



Probability	Current Scenario	NACUBO 25-50
Maintain Corpus	69.2%	62.1%

1. The probability of Maintain Corpus is based upon the net Monte Carlo results.
2. This analysis assumes that the Strategic Assumptions apply for the first 7 years and the Secular Assumptions apply thereafter.
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Summary



■ Current Scenario	14.9%	5.9%	-0.1%	6.0%	17.2%	-4.4%	21.8%	9.5%	16.0%	-12.3%	7.0%
■ NACUBO 25-50	14.6%	4.8%	-1.3%	6.5%	16.7%	-5.4%	20.6%	10.4%	14.4%	-13.9%	6.2%

1. This section reflects the performance of the portfolio on an asset class basis in each of the last 10 years. Historical returns are shown gross of cash inflows, cash outflows and advisory fees.
2. Past performance is no guarantee of future results.
3. Please refer to the Return Assumptions page of the appendix to view an important and relevant disclosure regarding return rates and fees.
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Historical Performance (Last 10 Years)

Asset Class Detail

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Last 10 Years Annualized
Cash	0.1%	0.0%	0.0%	0.3%	0.8%	1.9%	2.3%	0.6%	0.0%	1.5%	0.7%
Equities	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	26.6%	16.3%	18.5%	-18.4%	8.0%
Global Equities	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	26.6%	16.3%	18.5%	-18.4%	8.0%
Fixed Income & Preferreds	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	7.5%	-1.5%	-13.0%	1.1%
US Fixed Income Taxable	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	7.5%	-1.5%	-13.0%	1.1%
Alternatives	10.1%	2.8%	-0.4%	4.1%	8.2%	-5.2%	11.7%	10.4%	11.2%	-5.6%	4.5%
Real Assets	6.9%	2.9%	-21.7%	19.0%	5.4%	-11.6%	17.5%	-10.2%	30.2%	2.3%	3.0%
Absolute Return Assets	6.9%	3.0%	1.4%	5.8%	5.7%	-1.5%	7.3%	1.9%	8.1%	-2.3%	3.6%
Equity Hedge Assets	0.9%	10.6%	-0.3%	-1.6%	2.8%	-3.4%	9.8%	4.3%	8.9%	19.8%	5.0%
Private Investments	14.9%	12.5%	7.1%	5.6%	18.0%	7.8%	29.6%	-11.7%	30.6%	-0.2%	10.7%
Private Real Estate	11.7%	14.4%	7.0%	4.7%	13.8%	10.1%	26.4%	-20.5%	18.0%	9.8%	8.9%
Private Equity	17.9%	10.4%	7.2%	6.6%	22.3%	5.3%	32.8%	-2.4%	43.9%	-9.9%	12.4%

1) The Historical Performance returns for Equity Hedge Assets and Private Investments have been adjusted to account for infrequent pricing.

1. This section reflects the performance of the portfolio on an asset class basis in each of the last 10 years. Historical returns are shown gross of cash inflows, cash outflows and advisory fees.
2. Past performance is no guarantee of future results.
3. The Capital Market Assumptions applied in this analysis were defined by the firm's Global Investment Committee and were published in the "Annual Update of GIC Capital Market Assumptions" on March 29th, 2023.
4. Please refer to the Return Assumptions page of the appendix to view an important and relevant disclosure regarding return rates and fees.
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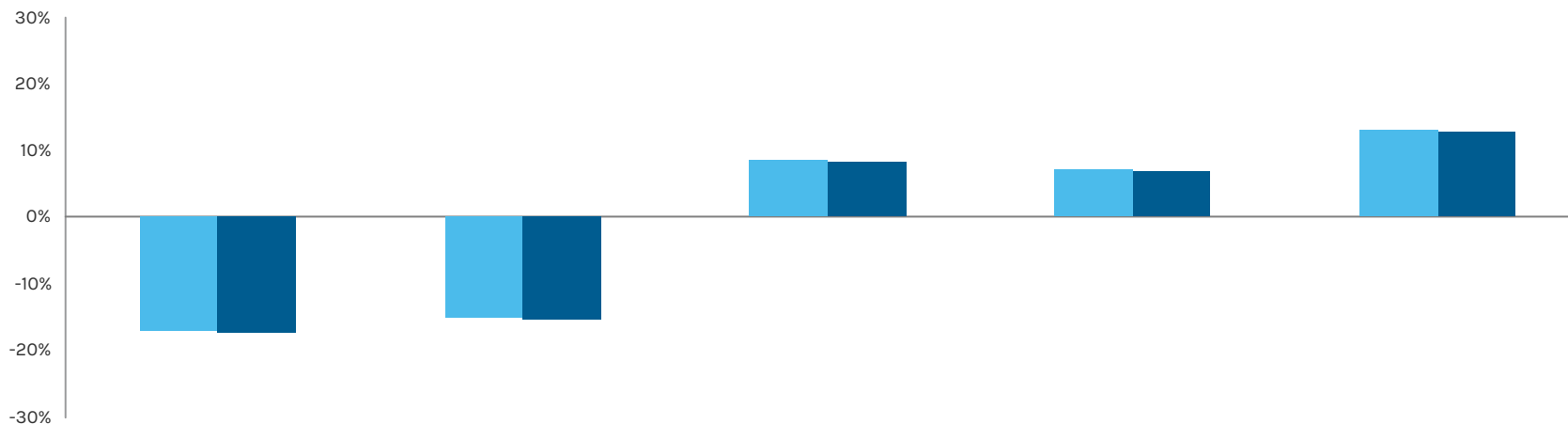
Summary

	Current Scenario			NACUBO 25-50		
	Asset Allocation	Return Contribution	Risk Contribution	Asset Allocation	Return Contribution	Risk Contribution
Cash	0.0%	0.0%	0.0%	3.0%	0.8%	0.0%
Equities	55.0%	56.9%	80.8%	58.0%	64.8%	87.2%
Global Equities	55.0%	56.9%	80.8%	58.0%	64.8%	87.2%
Fixed Income & Preferreds	20.0%	11.1%	-0.7%	22.0%	13.2%	-0.6%
US Fixed Income Taxable	20.0%	11.1%	-0.7%	22.0%	13.2%	-0.6%
Alternatives	25.0%	32.0%	19.9%	17.0%	21.2%	13.4%
Real Assets	0.0%	0.0%	0.0%	3.0%	3.8%	3.0%
Absolute Return Assets	5.0%	3.3%	1.9%	7.0%	5.1%	2.7%
Equity Hedge Assets	5.0%	4.7%	0.2%	0.0%	0.0%	0.0%
Private Investments	15.0%	24.0%	17.9%	7.0%	12.3%	7.8%
Private Real Estate	5.0%	6.1%	3.5%	2.0%	2.7%	1.1%
Private Equity	10.0%	17.9%	14.3%	5.0%	9.7%	6.7%

1) The Contribution To Risk And Return returns for Equity Hedge Assets and Private Investments have been adjusted to account for infrequent pricing.

1. Past performance is no guarantee of future results.
2. For use only in one-on-one presentations.

Summary



	S&P 500 -30%	MSCI World ex USA -30%	US 10 Year Treasury Yield +100bps	Crude Oil Price +30%	US Trade Weighted Dollar -10%
■ Current Scenario	-17.1%	-15.0%	8.7%	7.1%	13.0%
■ NACUBO 25-50	-17.3%	-15.4%	8.3%	6.9%	12.8%

1. Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
2. The market scenarios are changed independently of one another and tested one at a time. Concurrent market scenarios are not tested in this analysis.
3. For use only in one-on-one presentations.
4. For important information regarding the impact of expenses on performance please refer to the disclosures at the end of this material.

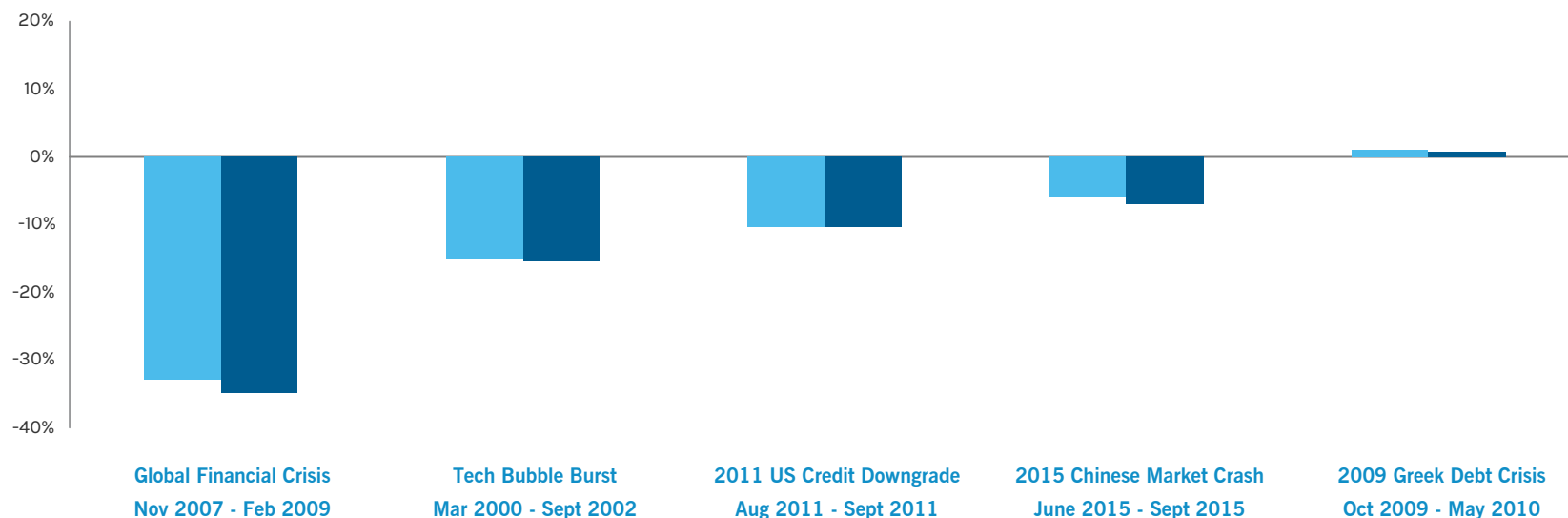
Asset Class Detail

	S&P 500	MSCI World ex USA	US 10 Year Treasury Yield	Crude Oil Price	US Trade Weighted Dollar
	-30%	-30%	+100bps	+30%	-10%
Cash	3.8%	3.9%	3.6%	3.7%	3.8%
Equities	-28.9%	-26.3%	10.7%	7.6%	15.9%
Global Equities	-28.9%	-26.3%	10.7%	7.6%	15.9%
Fixed Income & Preferreds	5.0%	4.8%	1.2%	4.5%	6.4%
US Fixed Income Taxable	5.0%	4.8%	1.2%	4.5%	6.4%
Alternatives	-8.9%	-6.6%	10.2%	7.9%	9.6%
Real Assets	-13.6%	-11.8%	9.8%	10.6%	14.7%
Absolute Return Assets	-2.1%	-1.0%	8.3%	7.3%	8.5%
Equity Hedge Assets	7.2%	6.7%	5.5%	7.1%	8.1%
Private Investments	-13.9%	-9.9%	11.5%	7.7%	13.0%
Private Real Estate	-5.7%	-3.5%	8.9%	6.0%	10.0%
Private Equity	-21.8%	-16.2%	14.4%	9.7%	16.4%

1) The Market Scenarios returns for Equity Hedge Assets and Private Investments have been adjusted to account for infrequent pricing.

1. Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
2. The market scenarios are changed independently of one another and tested one at a time. Concurrent market scenarios are not tested in this analysis.
3. For use only in one-on-one presentations.
4. For important information regarding the impact of expenses on performance please refer to the disclosures at the end of this material.

Summary



	Global Financial Crisis Nov 2007 - Feb 2009	Tech Bubble Burst Mar 2000 - Sept 2002	2011 US Credit Downgrade Aug 2011 - Sept 2011	2015 Chinese Market Crash June 2015 - Sept 2015	2009 Greek Debt Crisis Oct 2009 - May 2010
Current Scenario	-32.9%	-15.1%	-10.4%	-6.0%	1.0%
NACUBO 25-50	-34.8%	-15.5%	-10.5%	-7.1%	0.8%

- Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
- The historical scenarios are changed independently of one another and tested one at a time. Concurrent historical scenarios are not tested in this analysis.
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- For important information regarding the impact of expenses on performance please refer to the disclosures at the end of this material.

Asset Class Detail

	Global Financial Crisis Nov 2007 - Feb 2009	Tech Bubble Burst Mar 2000 - Sept 2002	2011 US Credit Downgrade Aug 2011 - Sept 2011	2015 Chinese Market Crash June 2015 - Sept 2015	2009 Greek Debt Crisis Oct 2009 - May 2010
Cash	2.5%	10.8%	0.0%	0.0%	0.1%
Equities	-54.9%	-43.2%	-16.1%	-11.6%	-2.2%
Global Equities	-54.9%	-43.2%	-16.1%	-11.6%	-2.2%
Fixed Income & Preferreds	6.1%	30.3%	2.2%	0.1%	3.9%
US Fixed Income Taxable	6.1%	30.3%	2.2%	0.1%	3.9%
Alternatives	-22.7%	-1.7%	-8.8%	-6.3%	3.4%
Real Assets	-49.7%	51.4%	-12.4%	-15.8%	6.8%
Absolute Return Assets	-17.3%	17.4%	-6.9%	-2.9%	5.9%
Equity Hedge Assets	7.8%	38.2%	0.6%	-3.1%	1.7%
Private Investments	-22.9%	4.6%	-10.2%	4.5%	1.1%
Private Real Estate	-25.2%	19.2%	-5.8%	5.7%	-13.7%
Private Equity	-22.0%	-10.8%	-14.5%	3.4%	17.3%

1) The Historical Scenarios returns for Equity Hedge Assets and Private Investments have been adjusted to account for infrequent pricing.

1. Annual returns are shown gross of cash inflows, cash outflows and advisory fees.
2. The historical scenarios are changed independently of one another and tested one at a time. Concurrent historical scenarios are not tested in this analysis.
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	Strategic Assumptions				Secular Assumptions			
	Annual Return	Standard Deviation	Sharpe Ratio	Yield	Annual Return	Standard Deviation	Sharpe Ratio	Yield
Cash	3.7%	0.8%	0.00	3.7%	3.1%	0.8%	0.00	3.1%
Equities	6.0%	13.4%	0.17	2.0%	8.8%	13.4%	0.42	2.0%
Global Equities	6.0%	13.4%	0.17	2.1%	8.8%	13.4%	0.42	2.1%
Fixed Income & Preferreds	4.9%	5.2%	0.22	4.9%	3.9%	5.2%	0.16	3.9%
US Fixed Income Taxable	4.9%	5.2%	0.22	4.9%	3.9%	5.2%	0.16	3.9%
Alternatives	6.8%	8.0%	0.38	0.0%	6.5%	8.0%	0.42	0.0%
Real Assets	6.2%	12.3%	0.20	2.5%	6.8%	12.3%	0.30	2.5%
Absolute Return Assets	6.2%	5.1%	0.47	0.0%	5.3%	5.1%	0.44	0.0%
Equity Hedge Assets	7.0%	9.0%	0.36	0.0%	6.3%	9.0%	0.36	0.0%
Private Investments	7.6%	15.5%	0.25	2.5%	11.2%	15.5%	0.52	3.4%
Private Real Estate	6.3%	16.7%	0.15	5.0%	8.6%	16.7%	0.33	6.9%
Private Equity	9.3%	16.2%	0.34	0.0%	14.0%	16.2%	0.67	0.0%

The Strategic Assumptions represent a time horizon of 7 years while the Secular Assumptions represent a time horizon of 20+ years. In the Linear Growth and Monte Carlo analyses the Strategic Assumptions apply for the first 7 years and the Secular Assumptions for each year thereafter. These assumptions are used for modeling purposes only. They are not guarantees of future returns.

1) The Return returns for Equity Hedge Assets and Private Investments have been adjusted to account for infrequent pricing.

- The assumed return rates in the Wealth Strategies Analysis are not reflective of any specific investment, do not include any fees or expenses that may be incurred by investing in specific products, nor all costs that you will incur when you implement your investment strategy. The return assumptions and hypothetical illustrations herein may be impacted after applying such costs, which may include investment advisory program fees up to a maximum of 2.0%, sub-manager fees, brokerage commissions, sales load or other expenses, which will depend on whether you choose a brokerage or an advisory relationship. The actual returns of a specific investment may be more or less than the asset class return assumptions used in the Wealth Strategies Analysis.
- It is not possible to invest directly in an index. The index performance shown does not reflect the impact of any taxes, transaction costs, management fees or other expenses that may be associated with certain investments. Indices are unmanaged.
- The Capital Market Assumptions applied in this analysis were defined by the firm's Global Investment Committee and were published in the "Annual Update of GIC Capital Market Assumptions" on March 29th, 2023.
- For use only in one-on-one presentations.

Correlation Assumptions

	Global Equities	US Fixed Income Taxable	Real Assets	Absolute Return Assets	Equity Hedge Assets	Private Investments
Global Equities	1.00	0.21	0.68	0.67	0.40	0.51
US Fixed Income Taxable		1.00	0.20	0.37	0.23	0.17
Real Assets			1.00	0.67	0.42	0.55
Absolute Return Assets				1.00	0.49	0.58
Equity Hedge Assets					1.00	0.44
Private Investments						1.00

The strategic and secular assumptions have the same correlations.

1. It is not possible to invest directly in an index. The index performance shown does not reflect the impact of any taxes, transaction costs, management fees or other expenses that may be associated with certain investments. Indices are unmanaged.
2. For use only in one-on-one presentations.

Asset Class	Benchmark	Data History
Cash	FTSE US Three-Month T-Bill	1978 - 2022
Equities	MSCI All-Country World (USD, Net)	1987 - 2022
Global Equities	MSCI All-Country World (USD, Net)	1987 - 2022
Fixed Income & Preferreds	Bloomberg US Aggregate	1976 - 2022
US Fixed Income Taxable	Bloomberg US Aggregate	1976 - 2022
Alternatives	HFRI Fund-Weighted Composite	1990 - 2022
Real Assets	Equal-Weighted Blend: Bloomberg Commodity; Alerian Midstream Energy Select; FTSE EPRA/NAREIT Global (USD)	1972 - 2022
Absolute Return Assets	Equal-Weighted Blend: HFRI Equity Market Neutral; HFRI Relative-Value: Total; HFRI Relative-Value: Fixed Income: Corporate	1990 - 2022
Equity Hedge Assets	Equal-Weighted Blend: Credit Suisse Global Macro; Credit Suisse Managed Futures	1994 - 2022
Private Investments	Equal-Weighted Blend: NCREIF Property; Cambridge Associates Private Equity	1972 - 2022
Private Real Estate	NCREIF Property	1978 - 2022
Private Equity	Cambridge Associates Private Equity	1986 - 2022

1. It is not possible to invest directly in an index. The index performance shown does not reflect the impact of any taxes, transaction costs, management fees or other expenses that may be associated with certain investments. Indices are unmanaged.
2. Past performance is no guarantee of future results.
3. For use only in one-on-one presentations.

Morgan Stanley Wealth Management, in conjunction with your Financial Advisor as well as other resources across Morgan Stanley, has prepared this presentation. The presentation was designed to illustrate the risk and return characteristics of various portfolios when taking into account cash considerations. Each analysis is unique and although no individual analysis can completely describe the risk and return characteristics of a portfolio, the combination of these analyses can assist clients in arriving at an appropriate wealth strategy.

Expected Returns, Standard Deviations and Correlations: Return assumptions are established by the Morgan Stanley Global Investment Committee. The Global Investment Committee utilizes an equilibrium approach to generate expected returns, standard deviations and correlations for each asset class. We believe that by analyzing current and historical economic conditions and market trends, and then making projections of future economic growth, inflation, real yields for each country, we can estimate the equilibrium performance for an asset class. The equilibrium return is simply the central tendency around which market returns tend to fluctuate over a very long period of time. It is possible that actual returns will vary considerably from this equilibrium, even for a number of years, but we believe that market returns will eventually return to their equilibrium trend.

Monte Carlo Analysis: Monte Carlo simulation is an analytical technique which uses several iterations of hypothetical events. Statistics on the distribution of results can help infer which simulated variables are more likely. When simulating hypothetical asset class performance, we utilize Morgan Stanley's expected returns, standard deviations and correlations for each asset class. Small changes in these assumptions may have a sizable impact on the results. As such, the analysis is provided only for general guidance about asset allocation. There can be no assurances that the Monte Carlo-simulated results will be achieved or sustained. Your actual results will surely vary. For example, our simulations don't account for fees or transaction costs, which may be charged when you invest in an actual portfolio of securities. However, the goal of the Monte Carlo analysis is not 100% accurate forecasting, but rather to allow investors to make better, more informed decisions.

Asset Allocations: Unless otherwise stated, this analysis assumes that asset allocations remain constants and achieve the return and standard deviation assumptions over the period in which they are invested.

1. Important: The projections or other information generated by the Wealth Strategies Analysis Tool regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of futures results. Results generated by a Monte Carlo analysis will vary with each use and over time because each portfolio simulation is randomly generated.
2. For use only in one-on-one presentations.

Expected Performance: Performance assuming that portfolios achieve their annual return assumption each year in which they are invested.

Expected Tail Loss: The average expected 1-year portfolio loss, at a 95% confidence level, if an extraordinarily bad event does occur.

Sharpe Ratio: This calculation measures a ratio of return above the risk free rate to volatility.

Standard Deviation: A statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution.

Value at Risk: The maximum expected 1-year portfolio loss, at a 95% confidence level, if an extraordinarily bad event does not occur.

Worst Trial: This is defined as the worst hypothetical performance of the portfolio in a given year. While it's always possible, albeit with an infinitely small chance, that a portfolio could lose all its money in a year, this is the most the portfolio lost in all the iterations of the first year of the Monte Carlo simulation.

Max Drawdown: Similar to the worst trial, this is the worst hypothetical performance of the portfolio, but not limited to a single year - it's a potential total loss over the course of the plan.

1. For use only in one-on-one presentations.

Different security types and asset classes carry different risks of investment.

Small/Mid Caps U.S. Equity: Investing in smaller companies involves greater risks not associated with investing in more established companies, such as business risk, significant stock price fluctuations and illiquidity.

International/Emerging Markets: International investing entails greater risk, as well as greater potential rewards compared to U.S. investing. These risks include potential and economic uncertainties of foreign countries as well as the risk of currency fluctuations. These risks are magnified in countries with emerging markets, since these countries may have relatively unstable governments and less established markets and economics.

Fixed Income: Fixed Income Securities are subject to interest rate risk, credit risk, prepayment risk, market risk, and reinvestment risk. Fixed Income Securities, if held to maturity, may provide a fixed rate of return and a fixed principal value. Fixed Income Securities prices fluctuate and when redeemed, may be worth more or less than their original cost.

High Yield Bonds: High Yield Fixed Income Investments, also known as junk bonds, are considered speculative, involve greater risk of default and tend to be more volatile than investment grade fixed income securities.

Hedge Funds: Hedge funds are appropriate only for long-term, qualified investors. They are generally illiquid, not tax efficient, and have higher fees than many traditional investments. They may also be highly leveraged and engage in speculative investment techniques which can magnify the potential for investment loss or gain.

REITS: REITs investing risks are similar to these associated with direct investments in real estate; lack of liquidity, limited diversification, and sensitivity to economic factors such as interest rate changes and market recessions.

Private Equity: Private equity interests may be highly illiquid, involve a high degree of risk and be subject to transfer restrictions.

TIPS: Because the return of TIPS is linked to inflation, TIPS may significantly underperform vs. fixed return treasuries in times of low inflation.

Managed Futures: Managed futures investments are speculative, involve a high degree of risk, use significant leverage, are generally illiquid, have substantial charges, subject investors to conflicts of interest, and are appropriate only for the risk capital portion of an investor's portfolio. Before investing in any partnership and in order to make an informed decision, investors should read the applicable prospectus and/or offering documents carefully for additional information, including charges, expenses and risks. Investors should read the prospectus and/or offering documents carefully for additional information, including charges, expenses and risks. Managed futures investments do not replace equities or bonds but rather may act as a complement in a well diversified portfolio.

Commodities: Investing in commodities entails significant risks. Commodity prices may be affected by a variety of factors at any time, including but not limited to, changes in supply and demand relationships, (ii) governmental programs and policies, (iii) national and international political and economic events, war and terrorist events, (iv) changes in interest and exchange rates, (v) trading activities in commodities and related contracts, (vi) pestilence, technological change and weather, and (vii) the price volatility of a commodity. In addition, the commodities markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, participation of speculators and government intervention.

MLPs: Investment in MLPs entails different risks, including tax risks, than is the case for other types of investments. Currently, most MLPs operate in the energy, natural resources or real estate sectors. Investments in MLP interests are subject to the risks generally applicable to companies in these sectors (including commodity pricing risk, supply and demand risk, depletion risk and exploration risk).

Alternative Investments: Any allocation containing alternative investments should note that they are highly illiquid and are only appropriate for investors willing to put capital at risk for an indefinite period of time. Alternative investments often engage in leverage and other speculative investment practices, may involve complex tax structures, typically have higher fees, and generally are not subject to the same regulatory requirements as traditional asset classes.

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Global Financial Crisis (11/2007 - 02/2009): The U.S. subprime mortgage crisis was a set of events and conditions that led to a financial crisis and subsequent recession that began in 2008. It was characterized by a rise in subprime mortgage delinquencies and foreclosures, and the resulting decline of securities backed by said mortgages. While elements of the crisis first became more visible during 2007, several major financial institutions collapsed in September 2008, with significant disruption in the flow of credit to businesses and consumers and the onset of a severe global recession.

Tech Bubble Burst (03/2000 - 09/2002): The dot-com bubble was a historic speculative bubble covering roughly 1997-2000 (with a climax on March 10, 2000, with the NASDAQ peaking at 5,408.60 in intraday trading before closing at 5,048.62) during which stock markets in industrialized nations saw their equity value rise rapidly from growth in the Internet sector and related fields.

2011 US Credit Downgrade (08/2011 - 09/2011): The 2011 US Credit Rating Downgrade by Standard and Poor was the first time in history the United States was downgraded. S&P cited mounting budget deficits and the lack of planning done to address the government's debt dynamics as the catalyst for the downgrade.

2009 Greek Debt Crisis (10/2009 - 05/2010): In 2009, the Greek government revealed it had underreported its budget deficit. As a result, borrowing costs skyrocketed and the country's credit rating was downgraded, leading to a loss of confidence in the Greek economy. The economic crisis in Greece exposed problems with the institutional architecture of the Eurozone and led to increased uncertainty throughout financial markets.

2015 Chinese Market Crash (06/2015 - 09/2015): Between June 2014 and June 2015, China's Shanghai Composite index rose by 150 percent. A large portion of this acceleration in stock prices was due to retail investors' ability to invest on margin. Given this sensitivity to asset prices, when investors were met with margin calls in June of 2015, many were forced to sell. This wave of selling snowballed, leading to a ~30% decrease in the value of A-shares on the Shanghai Stock Exchange.

1. For use only in one-on-one presentations.

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Important: The projections or other information generated by the Wealth Strategies Analysis 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. Results generated by a Monte Carlo analysis will vary with each use and over time because each portfolio simulation is randomly generated.

Any samples included in this analysis are not recommendations to pursue any estate planning or asset allocation strategy. They are shown for illustration purposes only.

Since the future cannot be forecast, actual results will vary from the information shown for the future, including estimates and assumptions. The results may vary with each use and over time. It is possible that these variations may be material. The degree of uncertainty normally increases with the length of the future period covered. As a result, Morgan Stanley Wealth Management cannot give any assurances that any estimates, assumptions or other aspects of the following analyses will prove correct. They are subject to actual known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those shown.

Investing in financial instruments carries with it the possibility of losses and that a focus on above-market returns exposes the portfolio to above-average risk. Hypothetical performance illustrations are not guaranteed and are subject to market conditions. High volatility investments may be subject to sudden and large falls in value, and there could be a large loss on realization which could be equal to the amount invested.

Asset allocation does not assure profit or protect against loss in declining financial markets. Certain assumptions may have been made in the analyses that have resulted in the estimated return contained herein. Any change in these assumptions may have a material impact on any estimated returns.

Many of the views and opinions contained herein regarding asset allocation were prepared by Morgan Stanley Wealth Management and may differ materially from that of others at the Company. Nothing in this allocation is designed to constitute an individual investment plan which should only be devised after discussion with your Financial Advisor.

This Wealth Strategies Analysis Tool may contain historical asset class return data and statistically generated data from 1990-2017 which are not used to forecast potential return but rather to identify relative patterns of behavior among asset classes which when put in different combinations assume various levels of risk.

Blended index portfolio performance is shown for illustration purposes only. Hypothetical performance has inherent limitations and does not reflect actual performance, trading or decision making. The results vary and reflect material economic or market factors such as liquidity constraints or volatility, which have an important impact on decision making and actual performance.

Annualized return performance shown in this presentation does not reflect deduction of investment advisory fees; had they and other fees incurred in the management of the account been reflected the performance would have been lower; the investment advisory fees are described in Part II of the Morgan Stanley Form ADV; For example, for an account with an annual advisory fee of 2% deducted monthly, if the annual gross performance is 10%, the compounding effect of the fee will result in a net annual compound rate of return of approximately 7.93%. After a three-year period with an initial investment of \$100,000, the total value of the client's account would be approximately \$133,100 without the fee and \$125,716 with the fee.

Past performance is no guarantee of future results. These materials do not constitute an offer to either buy or sell securities or to participate in any trading strategy.

Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustration purposes only and do not show the performance of any specific investment. Reference to an index does not imply that the portfolio will achieve return, volatility or other results similar to the index. The composition of an index may not reflect the manner in which a portfolio is constructed in relation to expected or achieved returns, portfolio guidelines, restrictions, sectors, correlations, concentrations, volatility, or tracking error target, all of which are subject to change over time.

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If your account is invested in mutual funds or exchange traded funds (collectively "funds"), you will pay the fees and expenses of any funds in which your account is invested. Fees and expenses are charged directly to the pool of assets the fund invests in and are reflected in each fund's share price. These fees and expenses are an additional cost to you and would not be included in the Fee amount in your account statements. The advisory program you choose is described in the applicable Morgan Stanley Smith Barney LLC ADV Brochure, available at www.morganstanley.com/ADV.

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www.morganstanley.com/wealth/investmentsolutions/pdfs/adv/sotresponse.pdf.

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