NEPC, LLC

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City of Hartford Municipal Employee's Retirement Fund

Asset-Liability Study - Revised

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Introduction

Executive Summary

- **Capital markets backdrop continues to support a well diversified, globally balanced approach**
  - Current long-term strategic asset allocation policy target is a well diversified portfolio that strives for return without taking undue risk
  - Current policy target allocation expected to achieve an 7.3% return over 30 years using NEPC's 2016 capital markets forecasts, compared to a 7.75% expected return target

- **Statutory requirements will improve the City of Hartford's funded status if all contributions are met**
  - The Plan is utilizing a closed amortization schedule for part of the plan's unfunded liability, with 23 years remaining to amortize, 15 years to amortized recent and future changes in unfunded liability

- **Plan benefit payments outweigh future contributions, generating a negative cash flow profile**

- **NEPC's proposed allocations are similar in many respects to the Plan's current policy target with a few strategic differences**
  - A shift from public equity to private equity
  - An increase in the private debt allocation and creation of an opportunistic credit allocation
  - A reduction in the dedicated hedge fund target

Facing the Challenge of Subdued Capital Market Forecasts

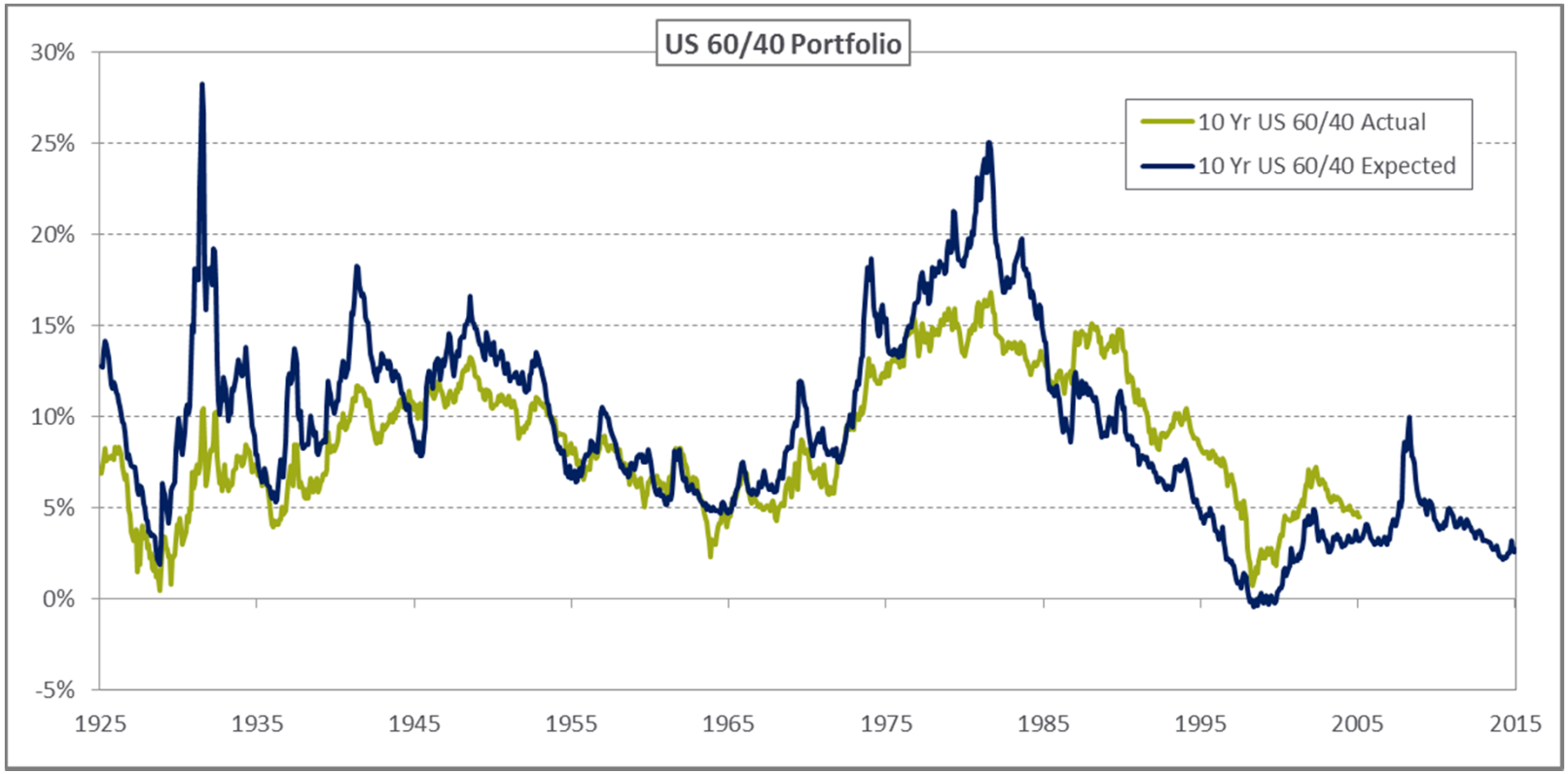
- **All investors face the same fundamental challenge**
  - Contributions + Investment Earnings must equal or exceed total Obligations (Benefits and Expenses)
  - For pension plans, this is the classic equation:

$$C + I = B + E$$

- **If investment return is lower than expected, adjustments are required to balance the equation**
  - Contributions must be higher,
  - Benefits + expenses must be lower, or
  - More risk must be taken to earn a similar return, or risk must be taken more efficiently

- **Adjusting investment return and risk is the most fluid of these factors**
  - Requires an understanding of both assets and liabilities to determine the "right" amount of risk in a portfolio
  - A key input is assessing the efficiency of a portfolio's implementation of the risk target
  - Requires any potential structural challenges from future cash flow dynamics be addressed and understood
  - The portfolio's macro economic bias must be evaluated and recognized

Low Global Cash Rates Suppress Long-Term Return Expectations



Source: Shiller Data, NEPC

- **U.S. centric 60/40 portfolios have been sufficient historically, but forward-looking return prospects are subdued**
  - Asset prices can be sustained, but low yields portend below average expected returns
- **Conventional investment approaches may fall short going forward**
  - Adjustments will be necessary to effectively meet and exceed long-term objectives

NEPC Market Outlook

Key Themes and Background for 2016

- **NEPC's market outlook includes both an intermediate (5-7 years) and long-term (30 years) forecast horizon**

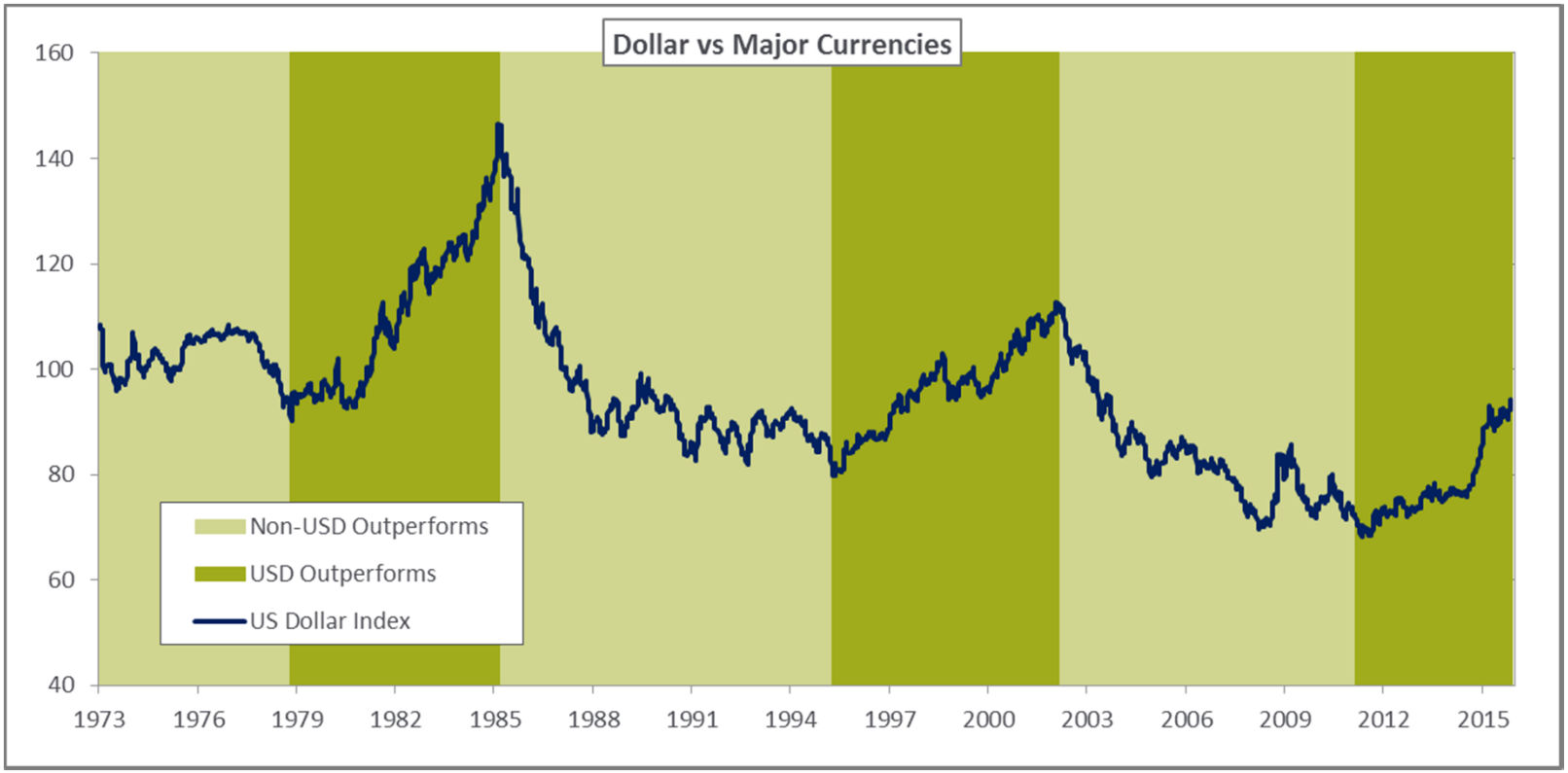
- **U.S. economic cycle and U.S. central bank policy are at the forefront of major cyclical and secular forces informing our Assumptions and Actions**
  - These factors interact to create a supportive environment for risk assets in the near term, but ultimately push long-term capital market forecasts lower relative to history

- **The U.S. economy is nearly 7 years removed from the previous recession, but the health of U.S. consumers can extend the expansion**
  - Prolonged U.S. economic cycle has the potential to push the U.S. dollar higher, straining commodity markets and international borrowers with dollar-based debt

- **Influence of central bank policies in the developed world remain broadly supportive for risk assets but come with long-term effects**
  - U.S. policy is diverging from Europe and Japan, but slow expected pace of hikes provides a positive backdrop for U.S. equities and credit in the near term

- **Emerging market growth compressed, yet still stronger than developed; fears of further adjustments in China remain a near-term concern**
  - Large currency adjustments across most emerging countries healthy for future prospects
  - Chinese Yuan (RMB) devaluation has been incremental relative to other EM FX adjustments

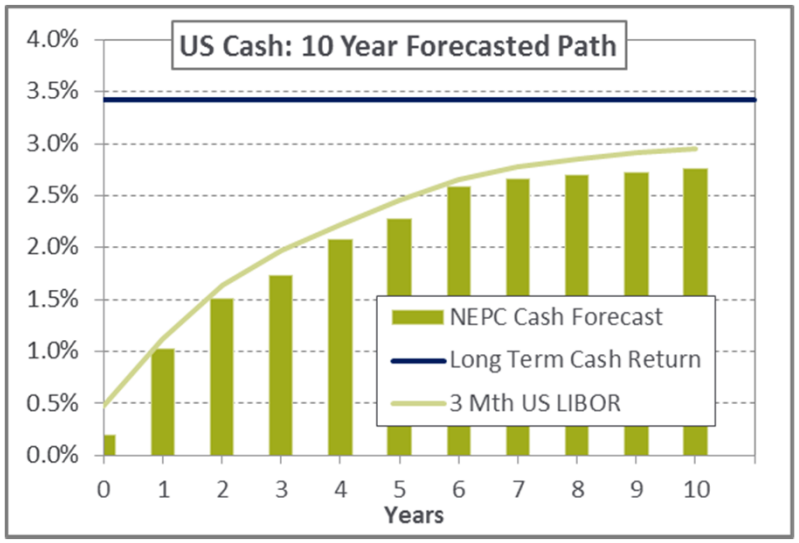
U.S. Dollar Cycle Characterized by Peaks of Overvaluation



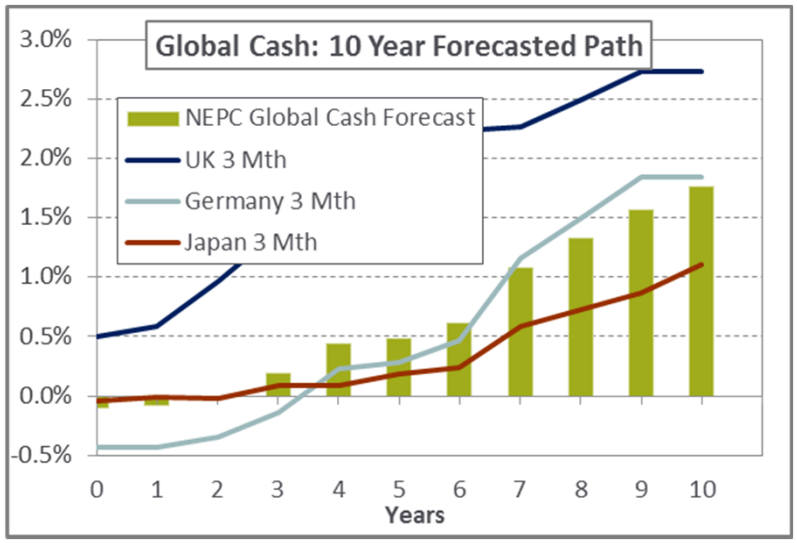
Source: Bloomberg, NEPC

- **A prolonged U.S. economic expansion is likely to have a significant influence on the U.S. dollar cycle**
  - Continued growth in consumer spending and U.S. economy have the potential to push the U.S. dollar to levels last seen in the late 1990's
- **U.S. dollar strength is interconnected with U.S. Federal Reserve policy**
  - Fed must balance the path of future interest rate increases relative to the disruptive effects of a strong dollar on global markets

Global Central Bank Policy: "Lower for Longer"



Source: Bloomberg, NEPC



Source: Bloomberg, NEPC

- **Accommodative global monetary policies flow through to markets, distorting the traditional asset return profile**
  - QE and negative interest rates suppress income while supporting higher valuations
  - Provides near-term support for market conditions in Europe and Japan

- **Potential extended period of low cash rates beyond market expectations poses challenges for all investors**
  - Subdued long-term cash expectations in the developed world compress long-term expected returns for both fixed income and equity

Asset Allocation Policy Analysis

Proposed and Comparative Asset Allocations

	Current Target	Current Allocation	Mix A (3% Opp Credit + Increased PM)	Mix B (3% Opp Credit + Increased SC)	Mix B (Increased PM)	Mix C (6% Return)	Mix D (7% Return)
Cash	**1.5%**	**3.7%**	**1.5%**	**1.5%**	**1.5%**	**2.5%**	**1.5%**
Large Cap Equities	10%	12%	12%	10%	12%	10%	12%
Small/Mid Cap Equities	5%	6.3%	5%	7%	5%	5%	6%
Int'l Equities (Unhedged)	11%	11.6%	12%	11%	11%	11%	12%
Emerging Int'l Equities	6%	5.3%	6%	6%	6%	4%	7%
Total Equity	**32%**	**35.2%**	**35%**	**34%**	**34%**	**30%**	**37%**
Core Bonds	5%	4.8%	0%	5%	5%	9%	3%
TIPS	4%	4.2%	5%	4%	4%	4%	0%
High-Yield Bonds	4%	4.3%	4%	4%	4%	0%	4%
EMD (Local Currency)	6%	6.5%	6%	6%	6%	4%	6%
Long Govt/Credit	6.5%	6.4%	5%	6.5%	3.5%	6.5%	7%
Absolute Return Fixed Income	5%	4.6%	5%	5%	5%	8%	4%
Opportunistic Credit	0%	0%	3%	3%	0%	0%	0%
Total Fixed Income	**30.5%**	**30.8%**	**28.0%**	**33.5%**	**27.5%**	**31.5%**	**24%**
Private Equity	5%	7.7%	9%	5%	9%	5%	9%
Private Debt	3%	3.2%	5.5%	6%	5%	3%	5%
Private Real Assets	3%	0.6%	3%	3%	3%	3%	3%
Real Estate (Core)	8%	6.8%	8%	8%	8%	8%	9%
Hedge Funds	10%	4.9%	5%	5%	7%	10%	5%
Total Alternatives	**29%**	**23.2%**	**30.5%**	**27%**	**32%**	**29%**	**31%**
Global Asset Allocation	7%	7.1%	5%	4%	5%	7%	7%
Total Other	**7%**	**7.1%**	**5%**	**4%**	**5%**	**7%**	**7%**
Expected Return 5-7 yrs	**6.5%**	**6.4%**	**6.9%**	**6.6%**	**6.7%**	**6.1%**	***6.9%***
Expected Return 30 yrs	**7.3%**	**7.3%**	**7.7%**	**7.4%**	**7.6%**	**7.1%**	***7.8%***
Standard Dev of Asset Return	**11.1%**	**11.4%**	**12.2%**	**11.4%**	**11.8%**	**10.2%**	***12.6%***
Sharpe Ratio (5-7 years)	**0.45**	**0.43**	**0.44**	**0.45**	**0.44**	**0.46**	***0.43***
Sharpe Ratio (30 years)	**0.39**	**0.38**	**0.39**	**0.39**	**0.38**	**0.40**	***0.38***

Proposed Opp. Credit Mixes (Side by Side)

	Current Target	Current Allocation	Mix A (3% Opp Credit + Increased PM)	Mix B (3% Opp Credit + Increased SC)
Cash	**1.5%**	**3.7%**	**1.5%**	**1.5%**
Large Cap Equities	10%	12%	12%	10%
Small/Mid Cap Equities	5%	6.3%	5%	7%
Int'l Equities (Unhedged)	11%	11.6%	12%	11%
Emerging Int'l Equities	6%	5.3%	6%	6%
Total Equity	**32%**	**35.2%**	**35%**	**34%**
Core Bonds	5%	4.8%	0%	5%
TIPS	4%	4.2%	5%	4%
High-Yield Bonds	4%	4.3%	4%	4%
EMD (Local Currency)	6%	6.5%	6%	6%
Long Govt/Credit	6.5%	6.4%	5%	6.5%
Absolute Return Fixed Income	5%	4.6%	5%	5%
Opportunistic Credit	0%	0%	3%	3%
Total Fixed Income	**30.5%**	**30.8%**	**28.0%**	**33.5%**
Private Equity	5%	7.7%	9%	5%
Private Debt	3%	3.2%	5.5%	6%
Private Real Assets	3%	0.6%	3%	3%
Real Estate (Core)	8%	6.8%	8%	8%
Hedge Funds	10%	4.9%	5%	5%
Total Alternatives	**29%**	**23.2%**	**30.5%**	**27%**
Global Asset Allocation	7%	7.1%	5%	4%
Total Other	**7%**	**7.1%**	**5%**	**4%**
Expected Return 5-7 yrs	**6.5%**	**6.4%**	**6.9%**	**6.6%**
Expected Return 30 yrs	**7.3%**	**7.3%**	**7.7%**	**7.4%**
Standard Dev of Asset Return	**11.1%**	**11.4%**	**12.2%**	**11.4%**
Sharpe Ratio (5-7 years)	**0.45**	**0.43**	**0.44**	**0.45**
Sharpe Ratio (30 years)	**0.39**	**0.38**	**0.39**	**0.39**

Opportunistic Investing

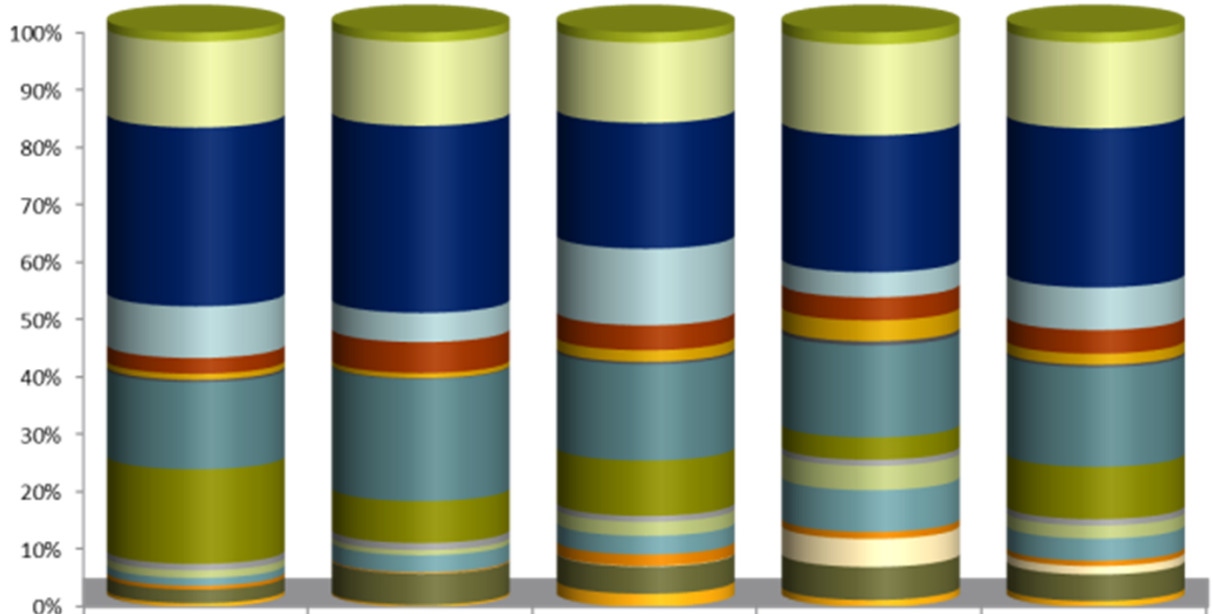
- **Opportunistic investments are those that are often short-term in nature and may be in a relatively small segment of the capital markets**
  - As such, opportunities won't always exist and the Fund should be structured accordingly
- **Due to the opportunistic nature of these investments, NEPC recommends implementing a dedicated target with flexible ranges**
  - NEPC recommends a 3% target to Opportunistic debt with ranges of 0% to 4%
  - The allocation to Opportunistic debt will be driven by market opportunities
- **Measuring the success of the Opportunistic allocation can be difficult**
  - What's the goal/objectives of the Opportunistic allocation?
  - What's the ideal benchmark?

- **Goal of Opportunistic Debt:**
  - To provide a broader opportunity set than traditional fixed income investments resulting in a higher return profile amid a low return environment and historically low global yields
  - Given the return expectations for fixed income assets broadly, Opportunistic debt has evolved into a growing allocation within institutional investors' portfolios

- **Structure of Opportunistic Debt:**
  - NEPC recommends a 3% target to Opportunistic debt with ranges of 0% to 4% predicated on current opportunities within the market place
  - If there are no clear dislocations in the market, assets should not be deployed to the Opportunistic Debt allocation

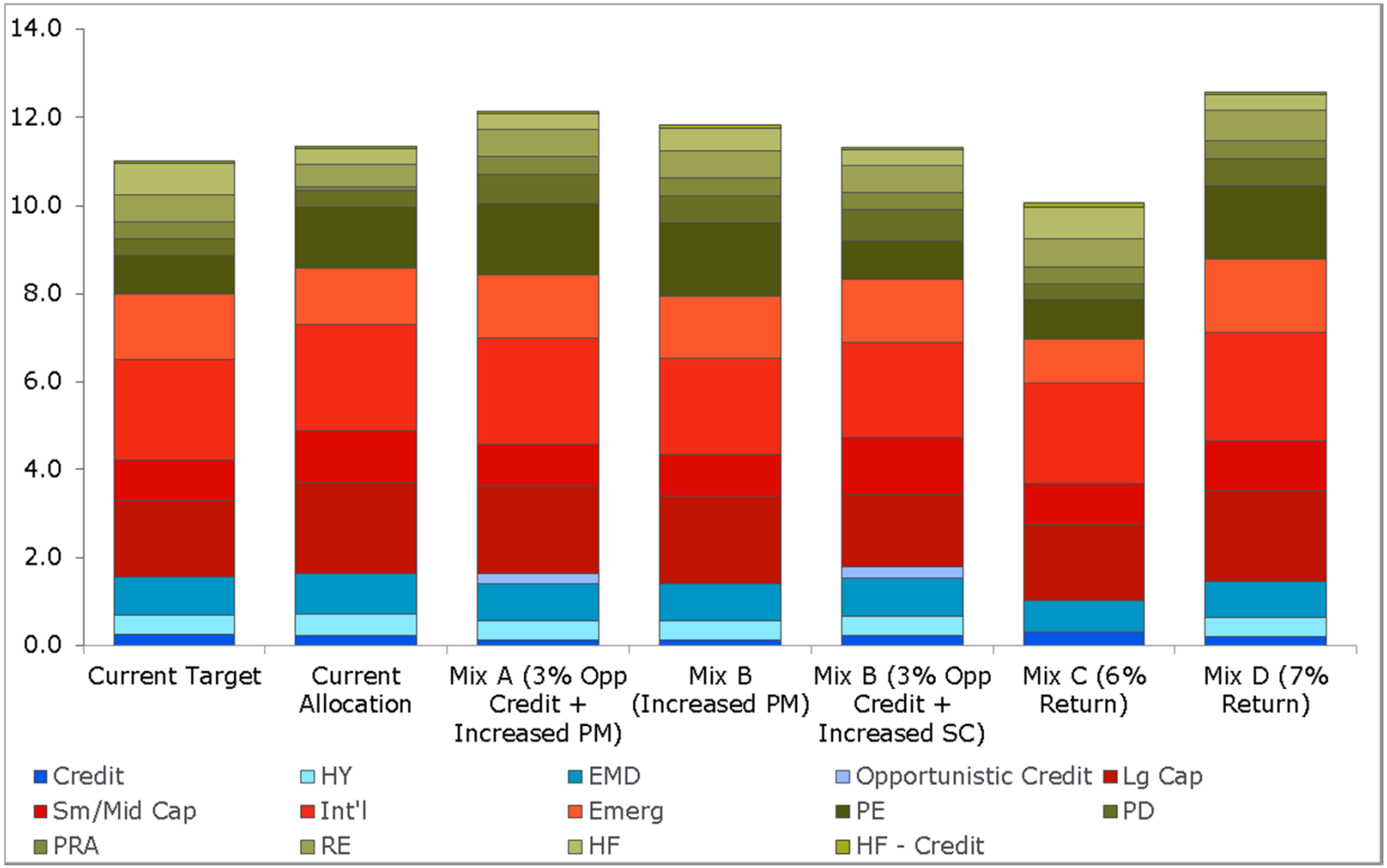
- **Investments within Opportunistic Debt:**
  - CLOs
  - Structured/Securitized Credit
  - Credit Focused Hedge Funds
  - Private Debt
    - Shorter lock up private debt investments

Comparative Public Fund Asset Allocations



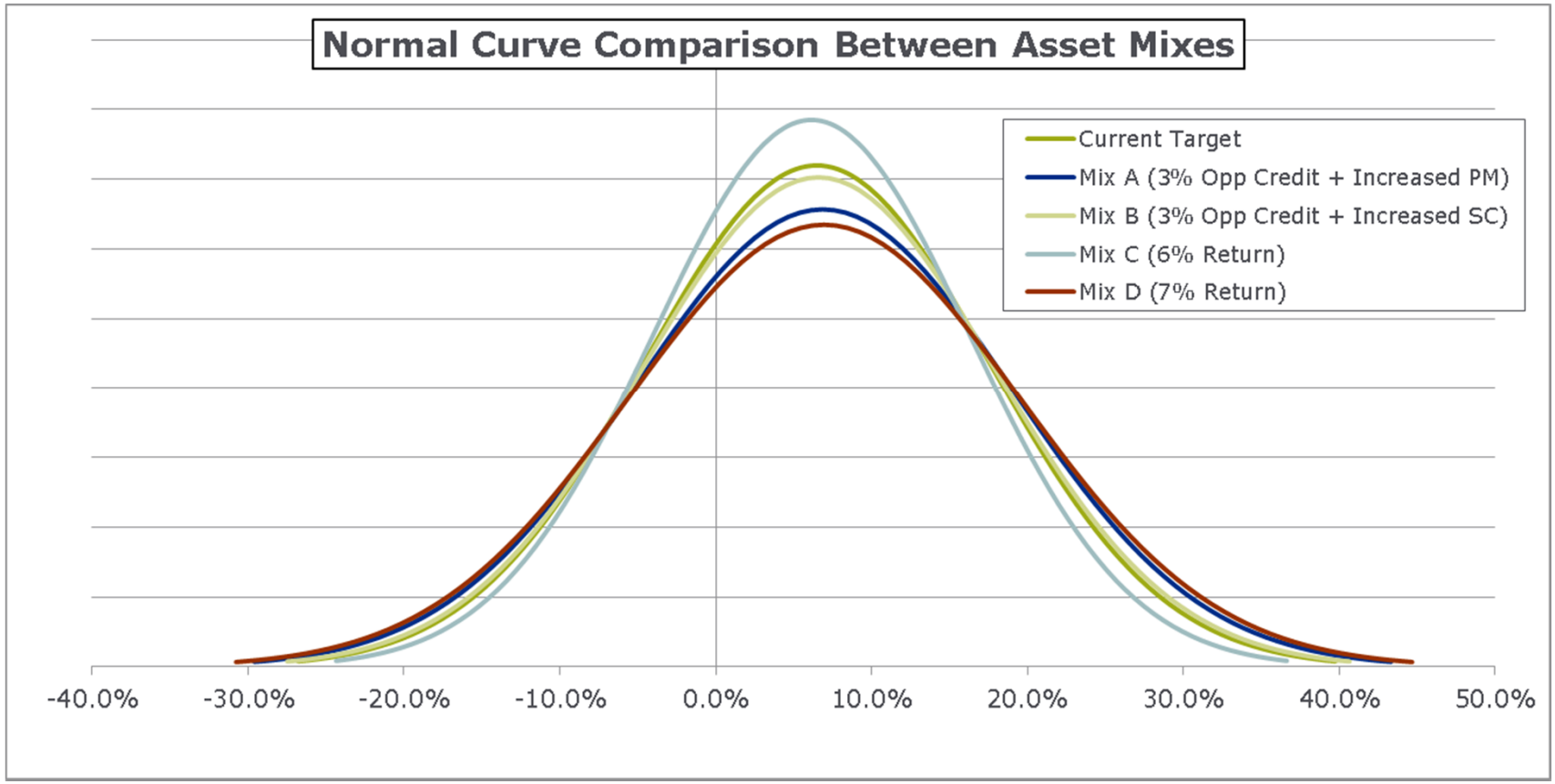
	InvestorForce Public DB - Less than $50mm	InvestorForce Public DB - $50mm to $250mm	InvestorForce Public DB - $250mm to $ 1Billion	InvestorForce Public DB - Over $1 Billion	InvestorForce Public DB
Observations	63	65	44	70	242
Emerging-Mkt Equity	1.6%	1.7%	1.8%	2.1%	1.8%
Global & Intl Equity	15.0%	14.6%	14.0%	15.8%	14.9%
US-Equity	31.1%	32.6%	21.9%	23.8%	27.7%
Misc Equity	9.0%	5.1%	13.3%	4.4%	7.4%
GAA/Multi-Asset	2.7%	5.4%	4.4%	4.0%	4.1%
Global & Intl Fixed Income	1.0%	0.9%	2.0%	3.6%	1.9%
Emerging-Mkt Fixed Income	0.4%	0.1%	0.4%	0.7%	0.4%
US-Fixed Income	15.2%	21.3%	16.8%	16.0%	17.3%
Misc Fixed Income	16.5%	7.3%	9.6%	3.9%	9.1%
Cash & Cash-Equivalents	1.1%	1.2%	1.0%	1.1%	1.1%
Hedge-Funds	1.3%	0.9%	2.4%	4.2%	2.3%
Private-Equity	1.4%	3.0%	3.2%	7.3%	3.9%
Real Assets-Commodities	0.7%	0.2%	2.0%	1.2%	1.0%
Misc Alternatives	0.0%	0.1%	0.1%	4.9%	1.5%
Real-Estate	2.4%	5.5%	4.8%	5.8%	4.6%
Undefined	0.6%	0.3%	2.3%	1.2%	1.0%

Risk Analysis - Allocation Comparison

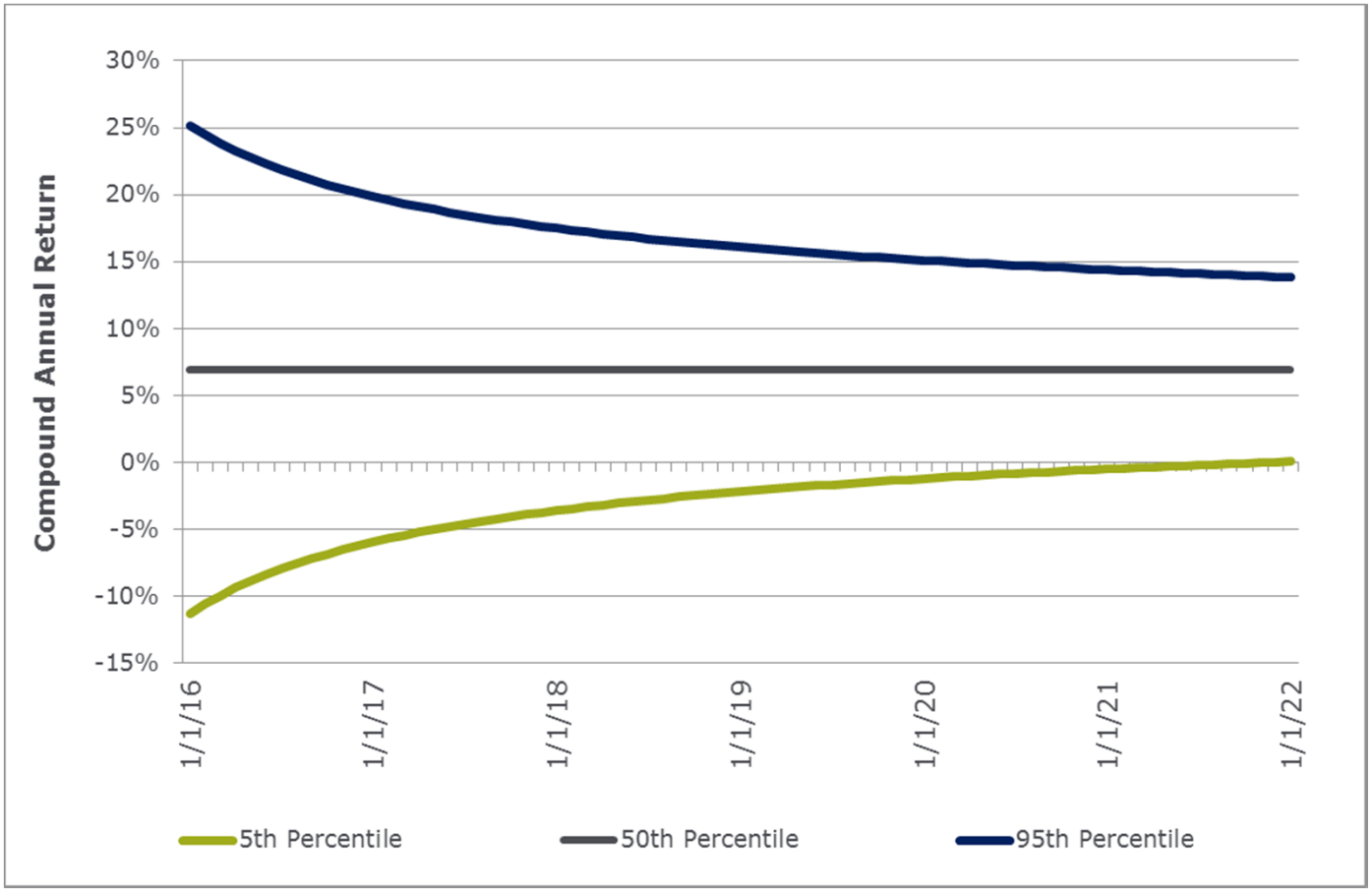


- **Increasing private markets or equity increase overall portfolio volatility, however also increases expected return potential**
- **Only Mix C decreases asset volatility, as well as return expectations**

Liquidity Analysis - Allocation Comparison

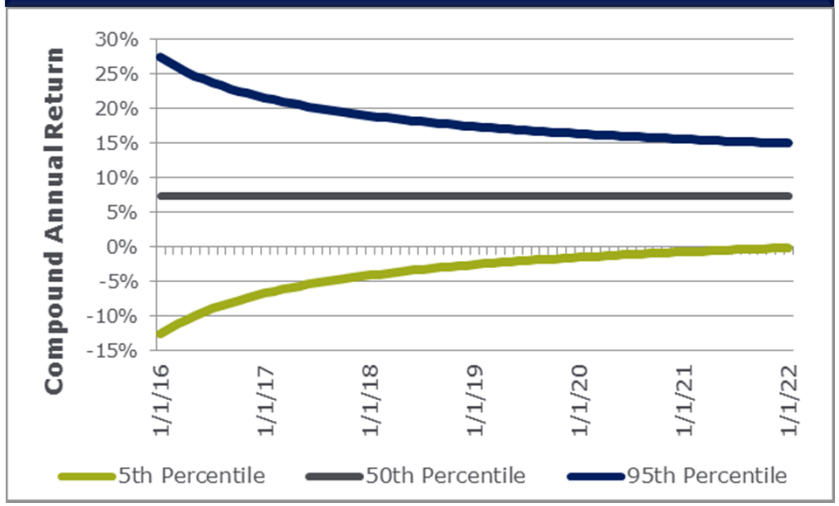


Return Profile – Current Target

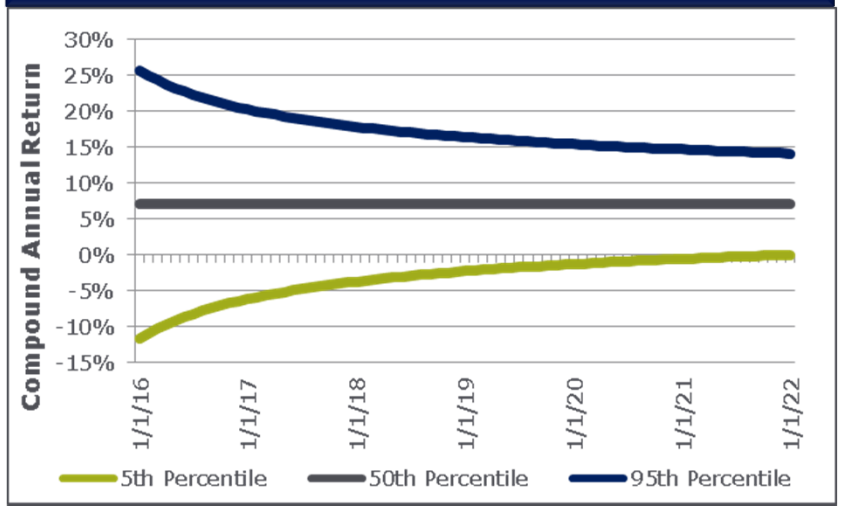


Return Profiles

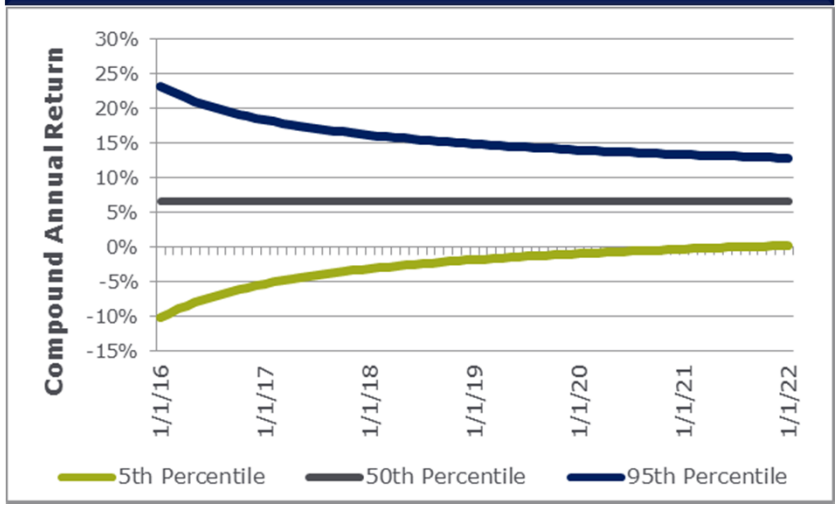
Mix A (3% Opp Credit + Increased PM)



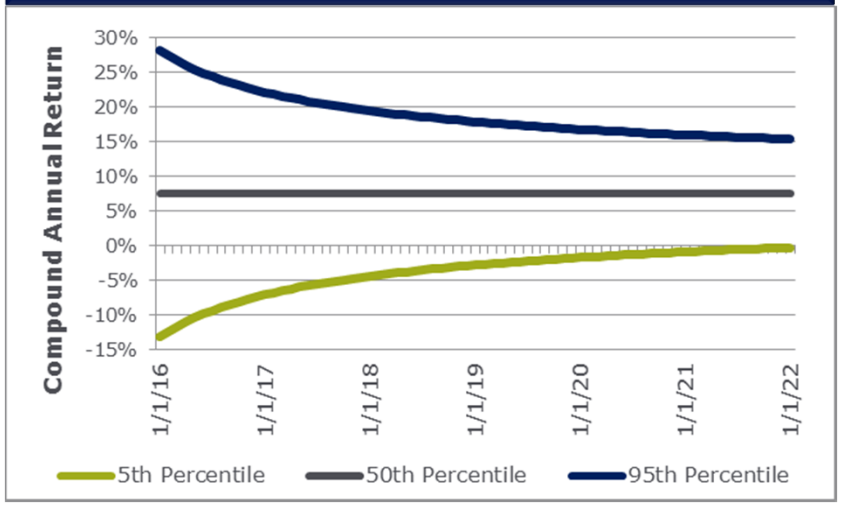
Mix B (3% Opp Credit + Increased SC)



Mix C (6% Return)



Mix D (7% Return)



Asset-Liability Projections

Plan Funded Status

Retirement Plan Funded Status	7/1/2015 Results	7/1/2016 Estimate
Plan Population		
Actives	2,370	
Retirees and Beneficiaries	2,966	
Terminated Vesteds	173	
Total	5,509	
Total Projected Payroll ($m)	$151	$156
Actuarial Accrued Liability ($m)	$1,366	$1,381
Valuation Assets ($m)	$1,060	$1,066
Funded Status	77.6%	77.2%
Market Value of Assets ($m)	$1,038	$997
Funded Status	76.0%	72.2%
Recommended Contribution ($m)	$41	$43
Contribution as a % of Payroll	25.8%	26.5%

Sources: 7/1/2015 values from Hooker & Holcombe; 7/1/2016 estimated results calculated by NEPC using Base Case assumptions and Current Target allocation

Plan Summary

- **As of June 30, 2015, the System was 78% funded on an actuarial basis**
  - Liabilities were discounted at a long-term rate of 7.75%
  - Discount rates for corporate pension plans have declined since the end of 2008
    - Public sector pension plans, however, are not immediately affected by moves in interest rates and have more gradual adjustments

- **As of June 30, 2016, the System is estimated to fall slightly to 77% funded on an actuarial basis**
  - Using actual asset return information through December 31, 2015, with expected returns after that date based on NEPC 2016 assumptions
  - Discount rate is assumed to remain at 7.75%

- **City contributions are expected to increase over the projection period under Base Case assumptions**
  - A second scenario is also analyzed where contributions are not made between April 2017 and July 2019, where contributions increase after July 2019

- **Annual benefit payments are greater than annual contributions from both employer and employee**
  - Any shortfall, therefore, needs to be made up through investment returns

Assumptions and Methodology

- **Liability calculations follow a roll-forward methodology based on:**
  - July 1, 2015 actuarial valuation by the Plan's actuary, Hooker & Holcombe
  - PVB benefit payment projections from the actuary

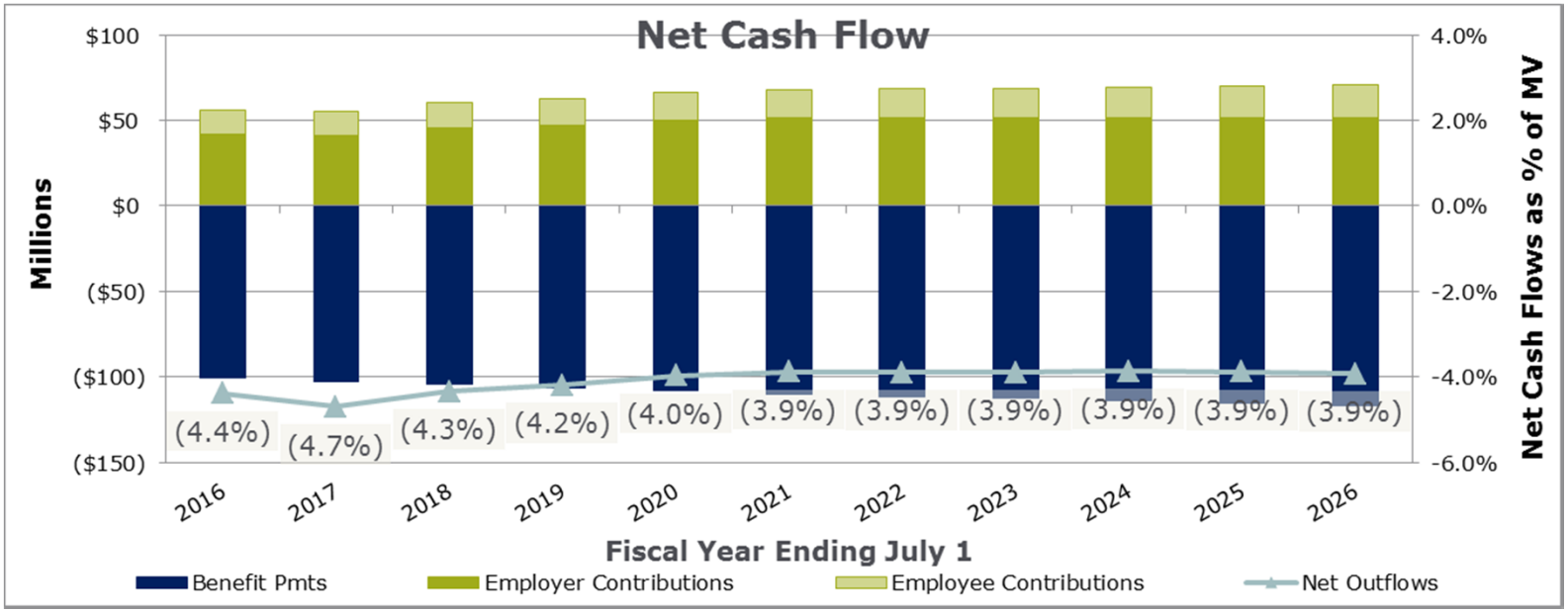
- **NEPC projected liabilities in accordance with plan methodologies**
  - Payroll and normal cost assumed to grow at 3.0%
  - Discount rate/EROA for all future years modeled at 7.75%

- **Actual asset returns through December 31, 2015 were used, with NEPC 2016 assumptions used for expected returns after that date**
  - Gains/losses smoothed over 5 years for Actuarial Value of Assets methodology

- **Contributions based under two scenarios**
  1. Based on calculated contribution rates
     - Recommended Contributions = Normal cost + amortization of unfunded liability
       - Amortization of 2013 UAL at 23 years as of July 1, 2015
       - Changes in UAL since 2013 amortized over 15 years
  2. Assumed no contributions from April 2017 to July 2019, then contribution resume again under calculated formula above

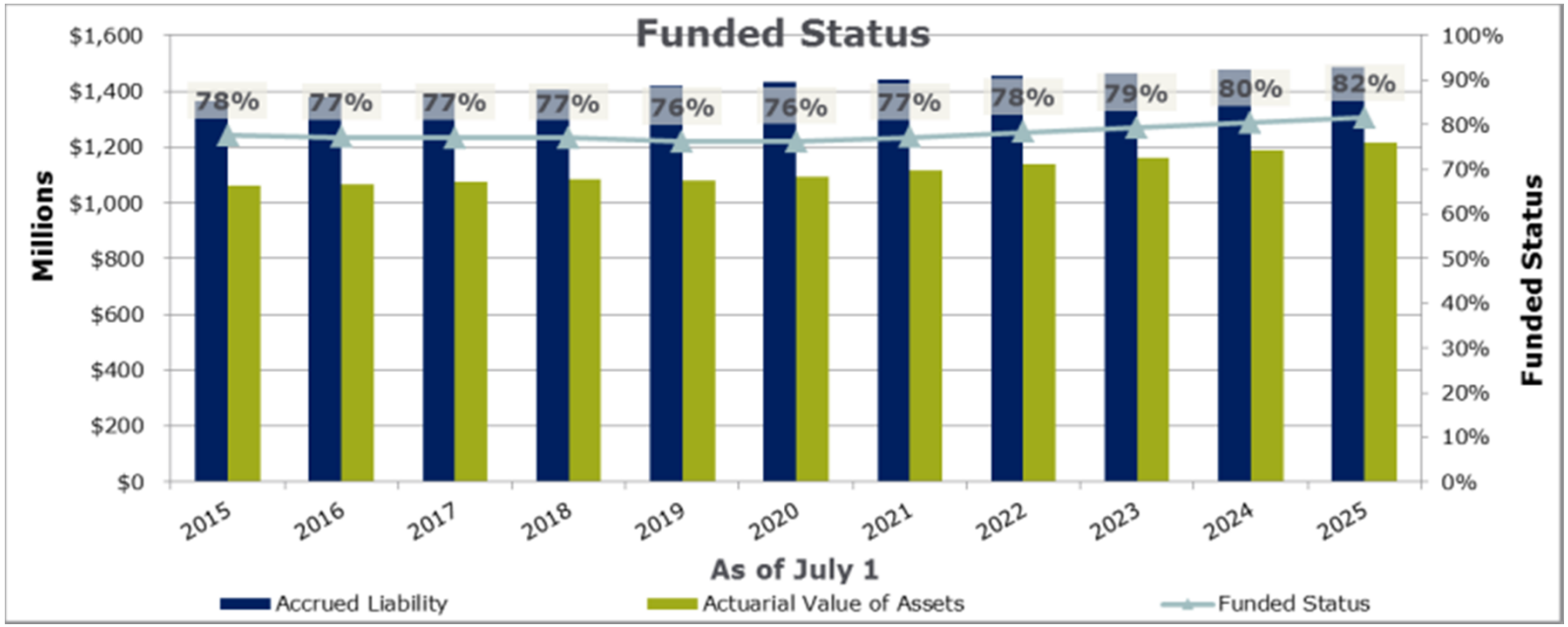
- **No future benefit, assumption, or plan changes are assumed**

Deterministic Projections: Under Current Policy Target



- **Contributions for the City are estimated to range from $41 to $51 million per year**
- **Benefit payments are projected to increase from $100 million to $118 million by 2026**
  - Benefit payments average 10.1% of total plan assets per year, over the next 10 years
  - Net outflows (benefit payments offset by contributions) average 4.1% of Market Value of assets over the 10-year period

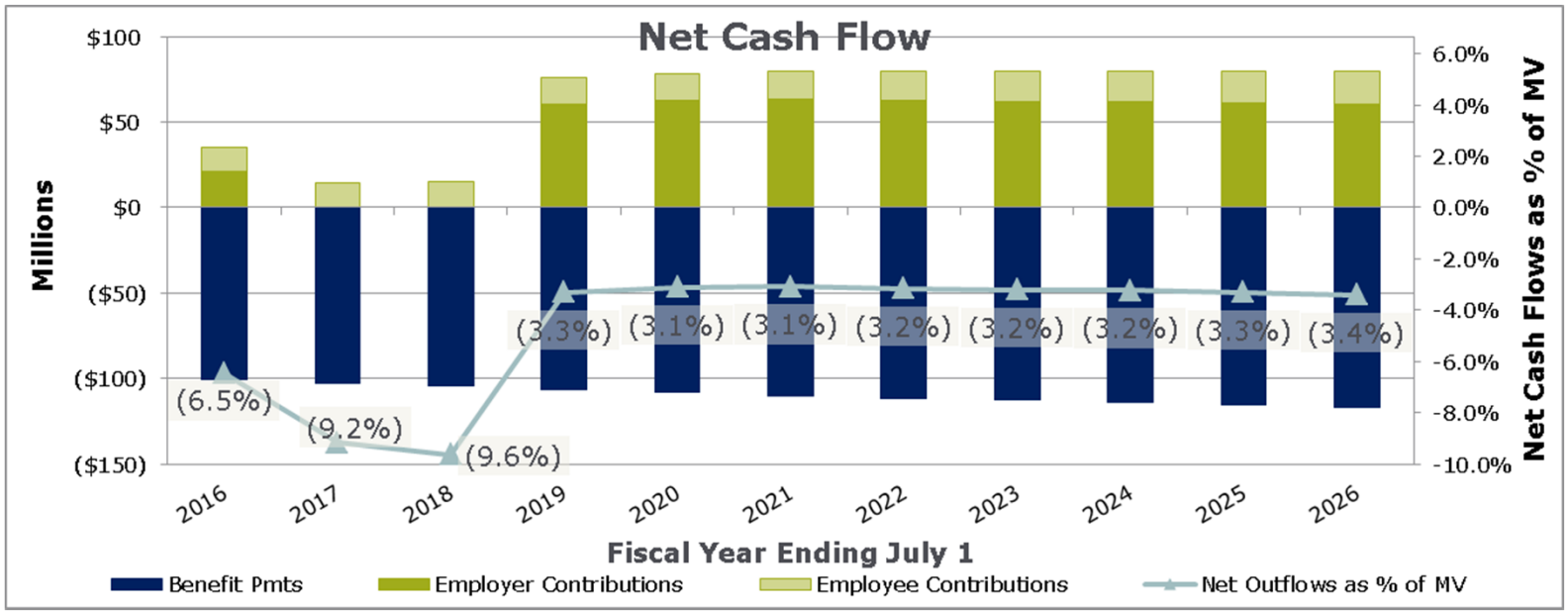
Deterministic Projections: Under Current Policy Target



- **Funded status is expected to increase gradually over the next 10 years**
  - Assets increase as expected contributions and asset returns are met
  - Liabilities grow on average 0.9% per year, with a flat discount rate of 7.75% assumed

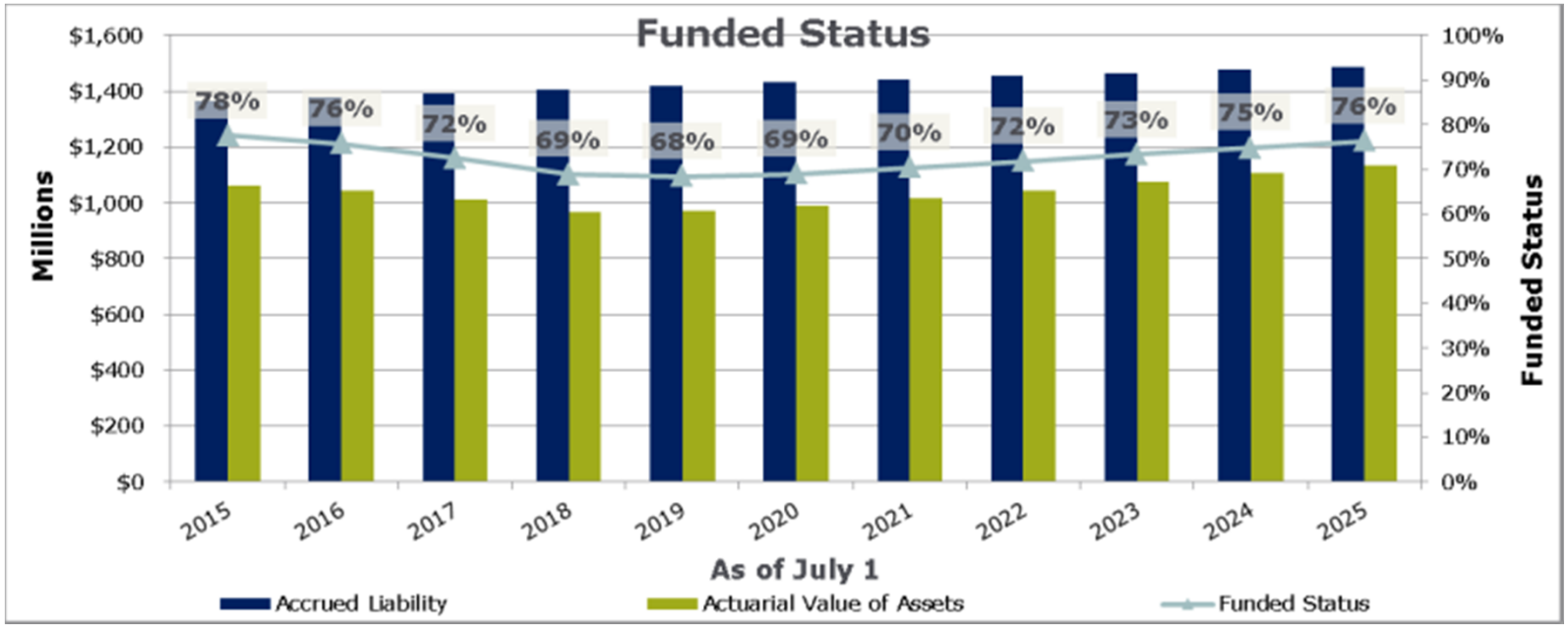
- **Asset projection based on NEPC's 5-7 year return of 6.5% for the Current Target**

Deterministic Projections: Under Current Policy Target and 2-year Contribution Holiday



- **This scenario assumes no contributions are made by the City in fiscal 2018 and 2019, then resume thereafter**
- **Contributions will be higher in the future (approximately $60-$62 million) under this scenario due to the larger unfunded liability created by the contribution "holiday"**
- **Benefit payments remain the same, and are projected to increase to $118 million by 2026**

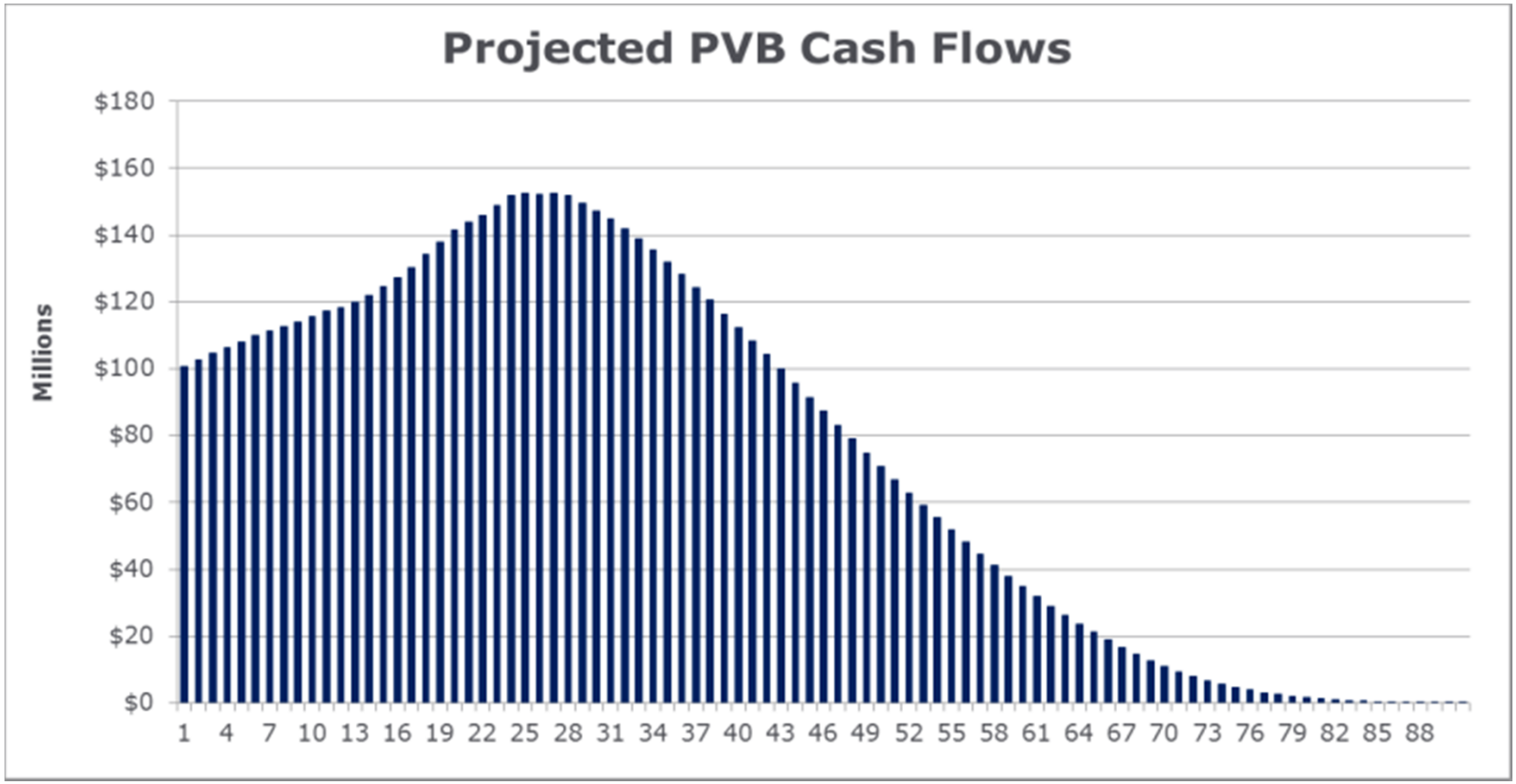
Deterministic Projections: Under Current Policy Target and 2-year Contribution Holiday



- **If contributions are not made by the City in fiscal 2018 and 2019, this will have a significant affect on plan funded status**
  - Funded status is expected to decline gradually to under 70%, until contributions resume in FYE 2020
  - Liabilities continue to grow on average 0.9% per year

- **Asset projection based on NEPC's 5-7 year return of 6.5% for the Current Target**
  - Assets decrease as no city contributions are made for two years, even though asset returns are met

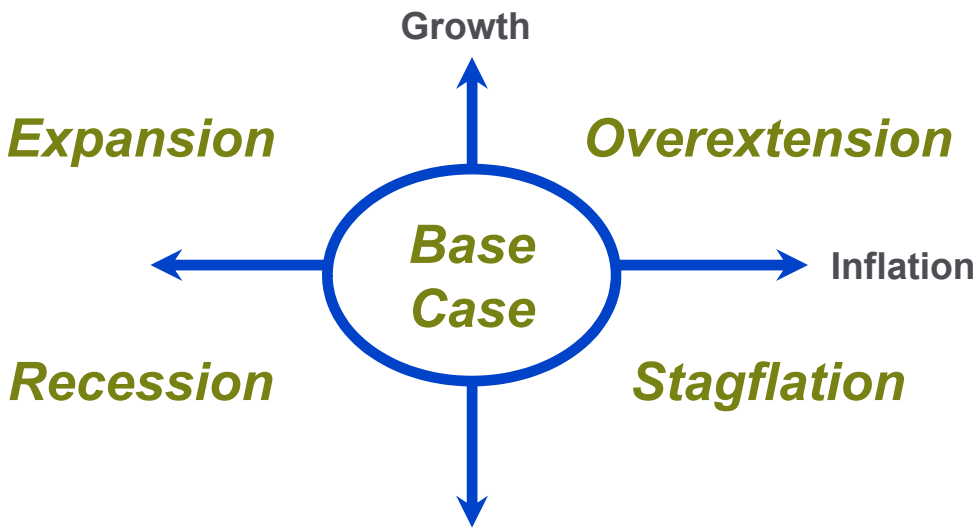
Projected Cash Flows



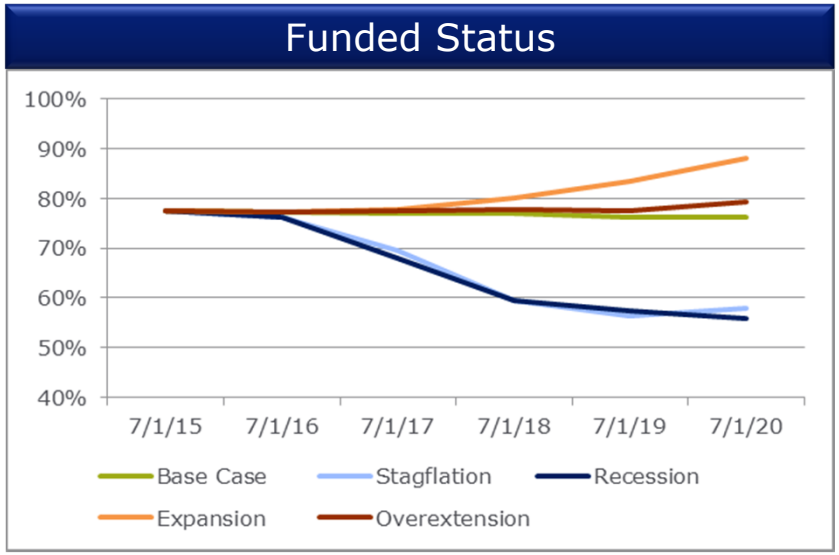
- **Benefit payments are projected to increase for the next 24 years, peaking in 2039**

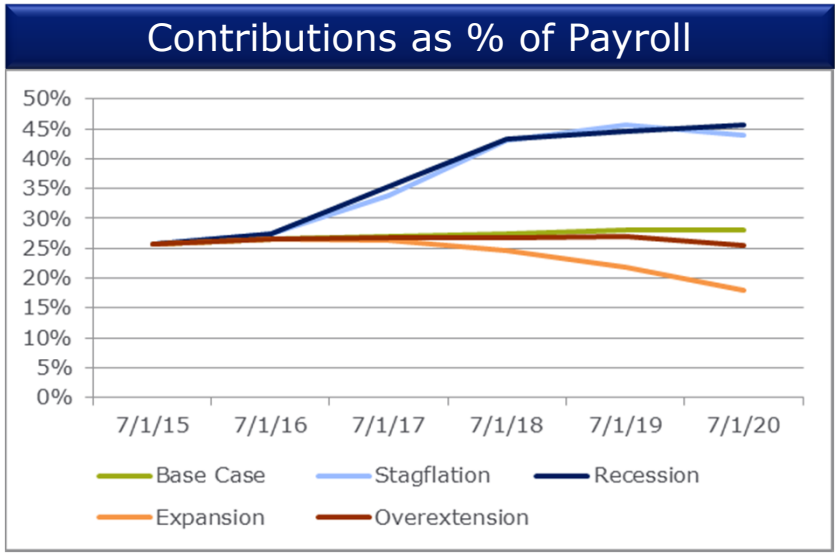
Scenario Analysis

- **NEPC Scenario Analysis allows plan sponsors to test the viability of asset mixes under multiple economic scenarios**
  - Allows better understanding of risk exposures under contrasting inflation and economic growth regimes
  - Can understand the effect on both assets and liabilities (funded status)



Scenario Analysis – Current Target



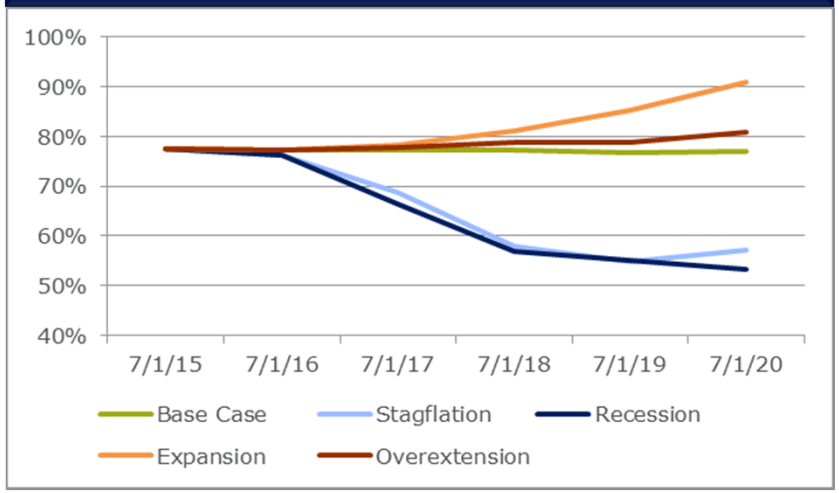


- **Funded status results range from 56% to 88% in 2020 based on various economic outcomes**
  - Recession and Stagflation scenarios produce year-over-year low returns for risky assets, thus stifling asset growth and deteriorating funded status

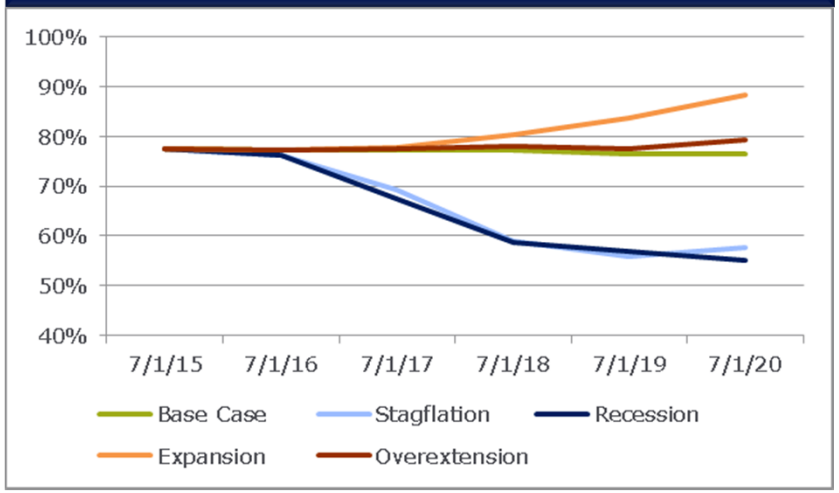
- **Contributions follow an opposite path than funded status**
  - Contributions could decrease as much as 9% of payroll by 7/1/20 in a very robust economy with low interest rates
  - On the other hand, contributions could increase to as much as 46% of payroll in four years with multiple years of negative returns

Scenario Analysis – Funded Status Percentage

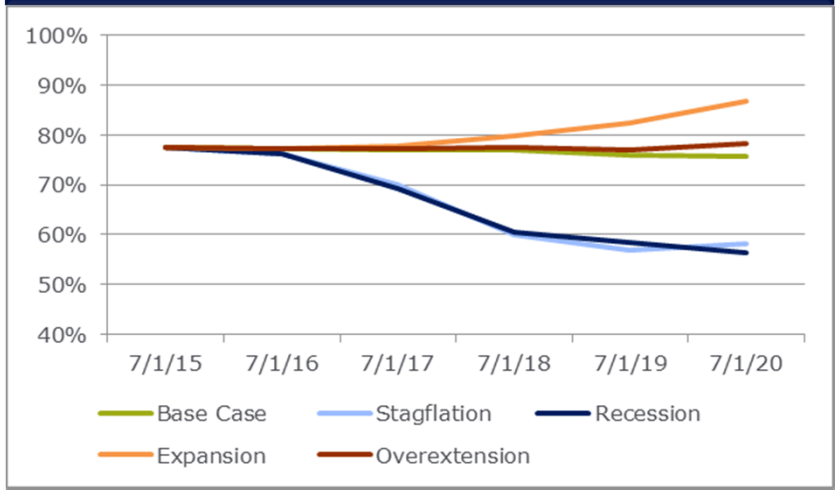
Mix A (3% Opp Credit + Increased PM)



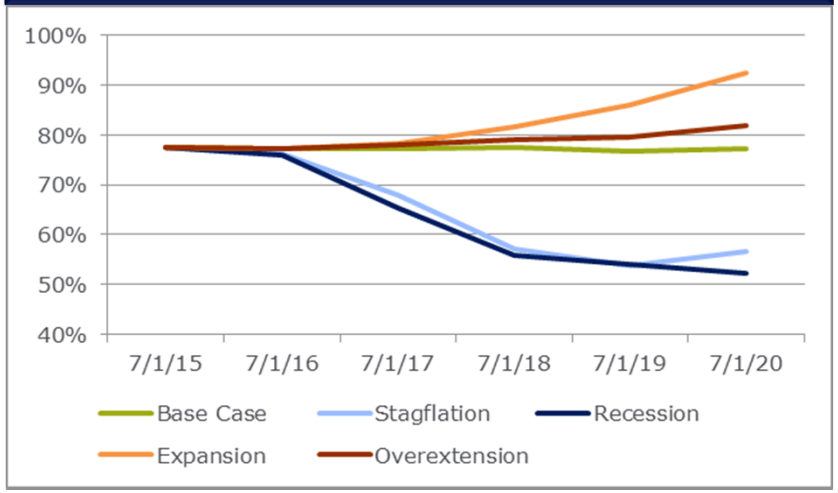
Mix B (3% Opp Credit + Increased SC)



Mix C (6% Return)

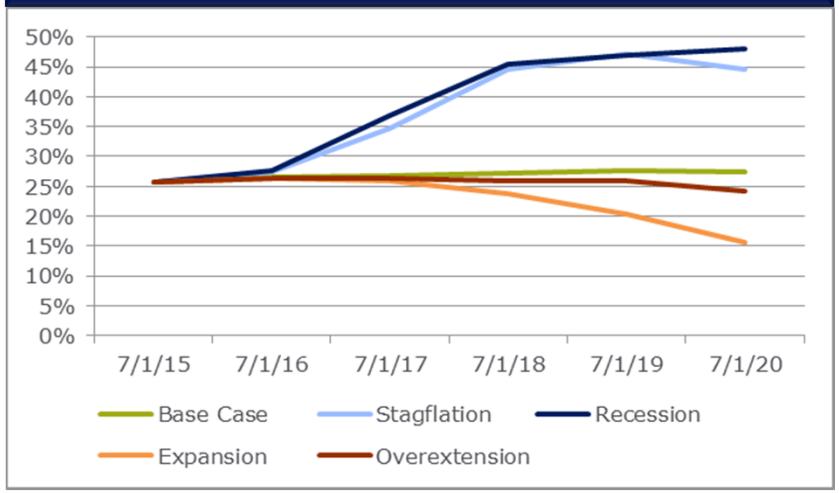


Mix D (7% Return)

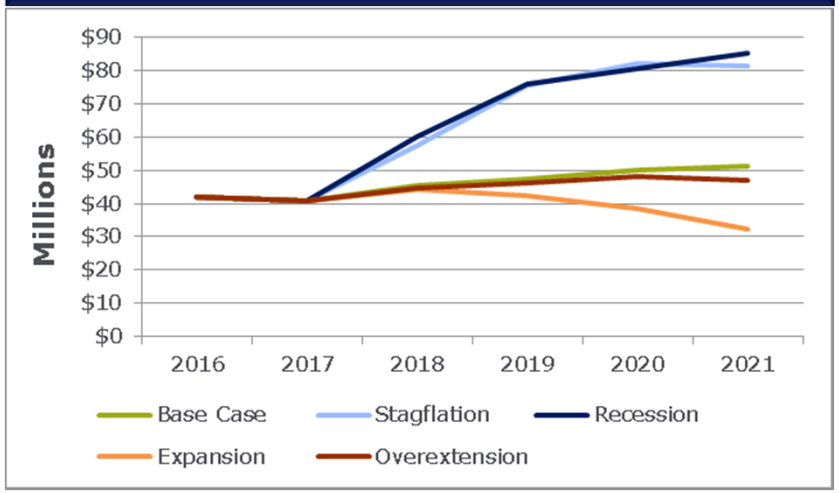


Scenario Analysis – Contributions as a % of Payroll

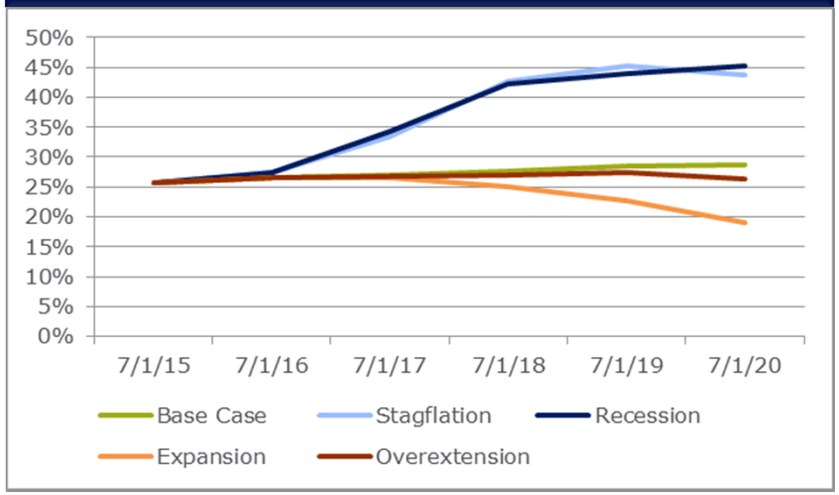
Mix A (3% Opp Credit + Increased PM)



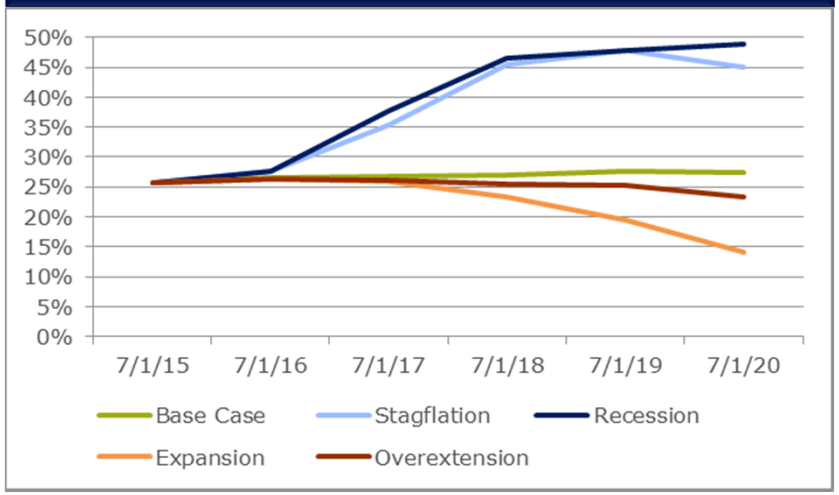
Mix B (3% Opp Credit + Increased SC)



Mix C (6% Return)



Mix D (7% Return)



5-Year Cost of Full Funding

	Current Target	Current Allocation	Mix A (3% Opp Credit + Increased PM)	Mix B (Increased PM)	Mix B (3% Opp Credit + Increased SC)	Mix C (6% Return)	Mix D (7% Return)
Base Case							
PV of FYE 2016-2020 Contributions	$204.1	$204.3	$203.0	$203.5	$203.8	$205.1	$202.8
PV of 7/1/2020 Unfunded Liability	$285.4	$288.0	$271.6	$277.9	$281.5	$297.7	$268.3
Total	$489.6	$492.4	$474.6	$481.4	$485.4	$502.8	$471.0
Change from Current		**$2.8**	**($15.0)**	**($8.1)**	**($4.2)**	**$13.3**	**($18.5)**
Stagflation							
PV of FYE 2016-2020 Contributions	$264.1	$267.7	$269.7	$268.0	$266.2	$262.2	$273.0
PV of 7/1/2020 Unfunded Liability	$558.8	$568.4	$573.2	$567.7	$565.4	$556.4	$578.0
Total	$822.9	$836.1	$842.8	$835.7	$831.6	$818.6	$851.0
Change from Current		**$13.2**	**$19.9**	**$12.8**	**$8.6**	**($4.3)**	**$28.1**
Recession							
PV of FYE 2016-2020 Contributions	$265.2	$267.2	$274.2	$272.8	$267.7	$260.8	$278.2
PV of 7/1/2020 Unfunded Liability	$599.8	$605.0	$624.1	$620.1	$606.2	$593.9	$632.6
Total	$865.0	$872.1	$898.2	$892.9	$873.9	$854.7	$910.8
Change from Current		**$7.2**	**$33.2**	**$27.9**	**$8.9**	**($10.3)**	**$45.8**
Expansion							
PV of FYE 2016-2020 Contributions	$189.6	$189.0	$185.8	$186.0	$189.3	$191.7	$183.8
PV of 7/1/2020 Unfunded Liability	$40.1	$30.8	($12.6)	($10.0)	$36.2	$68.2	($45.7)
Total	$229.7	$219.8	$173.2	$176.0	$225.5	$259.9	$138.1
Change from Current		**($9.9)**	**($56.5)**	**($53.7)**	**($4.2)**	**$30.2**	**($91.6)**
Overextension							
PV of FYE 2016-2020 Contributions	$201.0	$201.1	$197.4	$197.4	$200.9	$202.5	$195.9
PV of 7/1/2020 Unfunded Liability	$195.4	$199.0	$173.3	$170.3	$198.9	$211.4	$154.0
Total	$396.4	$400.0	$370.8	$367.7	$399.7	$414.0	$350.0
Change from Current		**$3.6**	**($25.7)**	**($28.7)**	**$3.3**	**$17.5**	**($46.4)**

- **Economic cost represents the present value of the unfunded liability in 2020 plus present value of contributions made over the next 5 years**
- **Green (negative) numbers are good, signaling *lower cost* than the current target allocation**
- **Red numbers indicate *higher cost* than the current target allocation**

Appendix – Opportunistic Debt

- **Typically, portfolios are grouped into two categories**
  1. **Strategic Allocation (5-7 year asset allocation outlook)**
  2. **Tactical Allocation (1-3 year asset allocation shifts)**

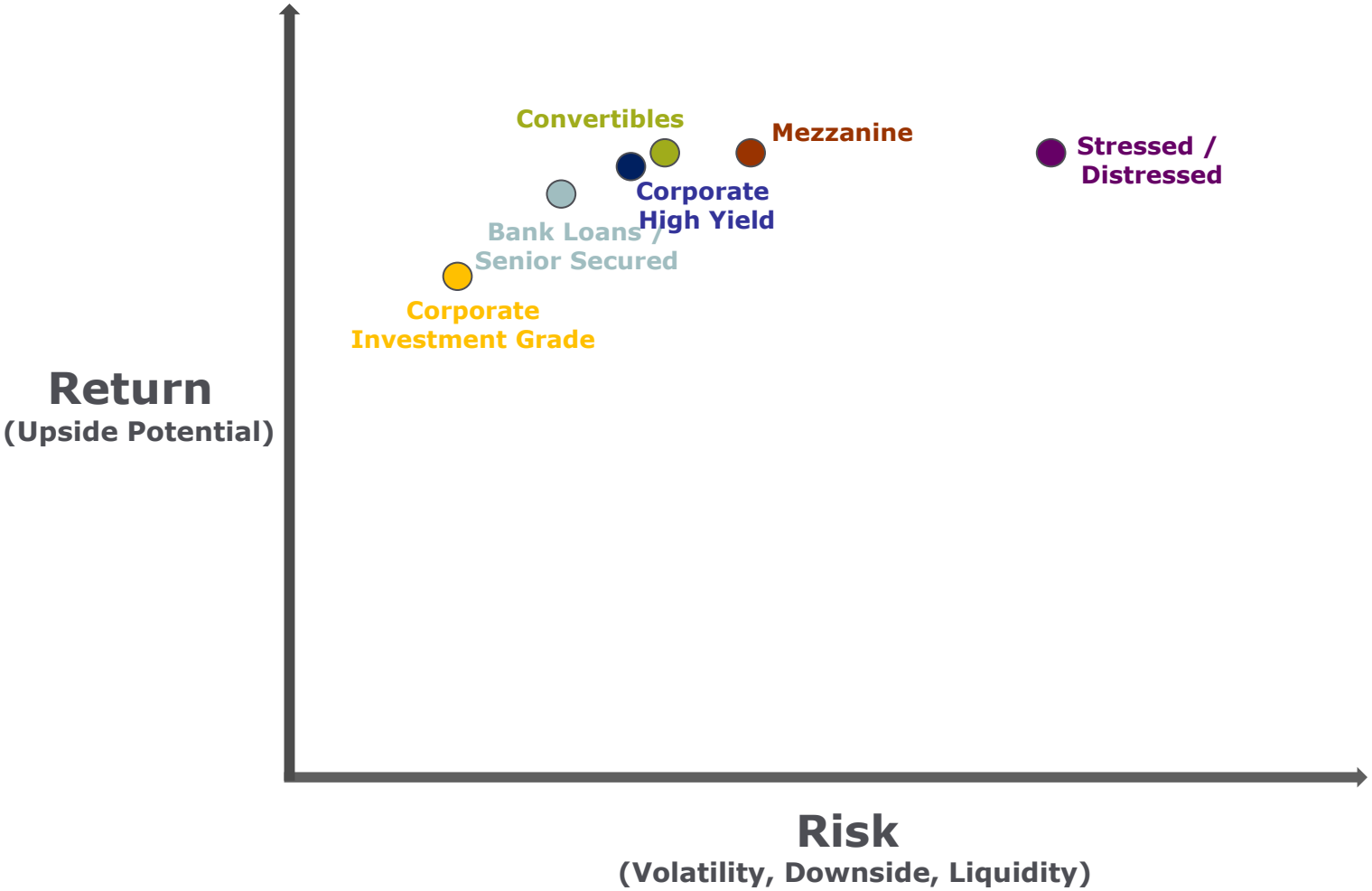
- **We define an opportunistic investment as a third category that generally stems from an imbalance of capital in the market**

- **The objective of an opportunistic allocation is not to speculate but**
  1. **To invest in undervalued asset classes**
  2. **Be a liquidity provider in a stressed environment**
  3. **Achieve a high rate of return *relative to the amount of risk taken***

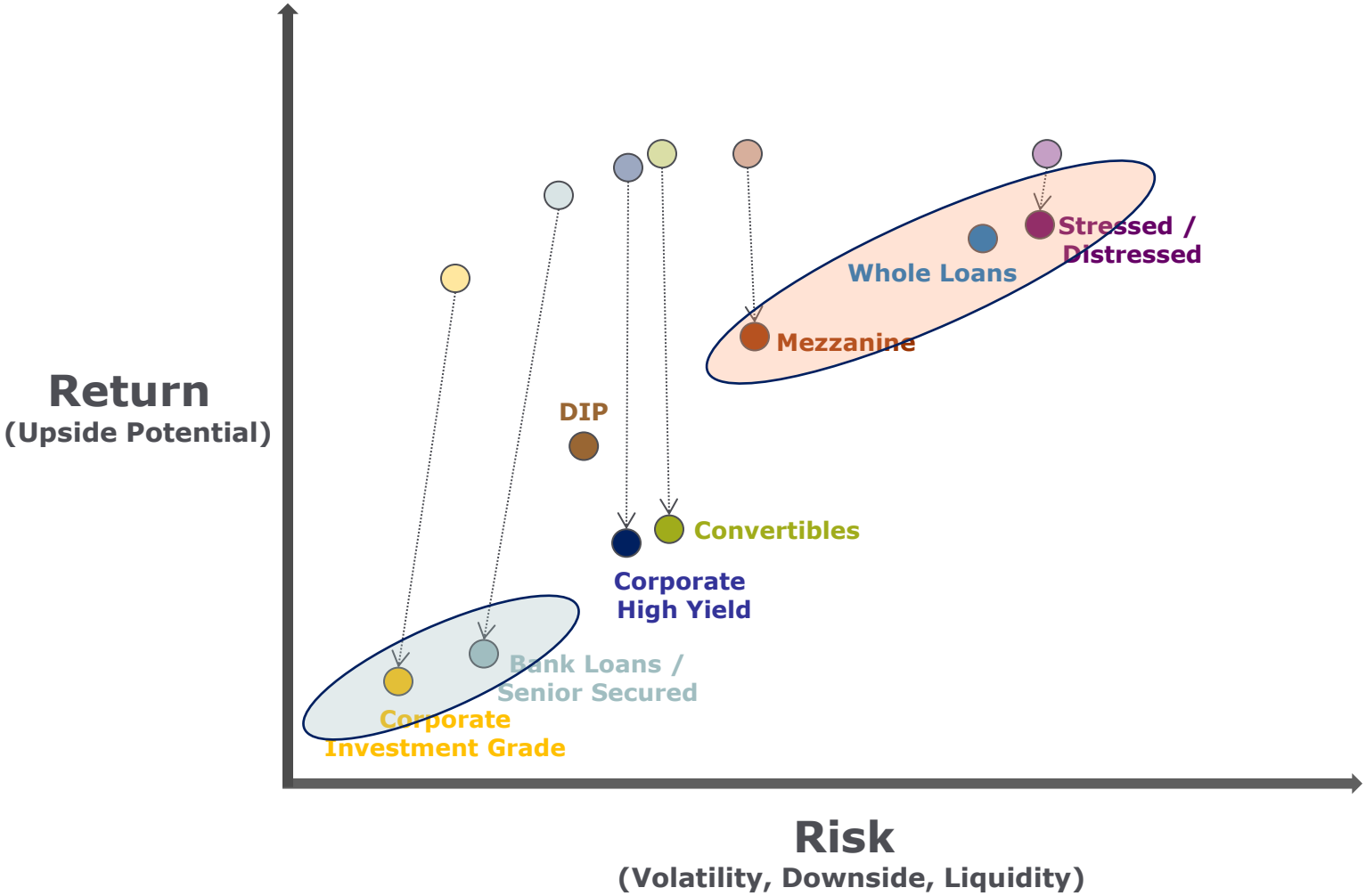
What to Expect…

- **Opportunistic investments are those that are often short-term in nature and may be in a relatively small segment of the capital markets**
- **Opportunities won't always exist and the Plan/Fund should be structured accordingly**
- **Where opportunistic investments fit within the Plan/Fund objectives, we recommend implementing a 0% target with a 0–10% range**
- **Measuring the success of the opportunistic allocation is not a straightforward exercise**

Looking Back to December 2008…



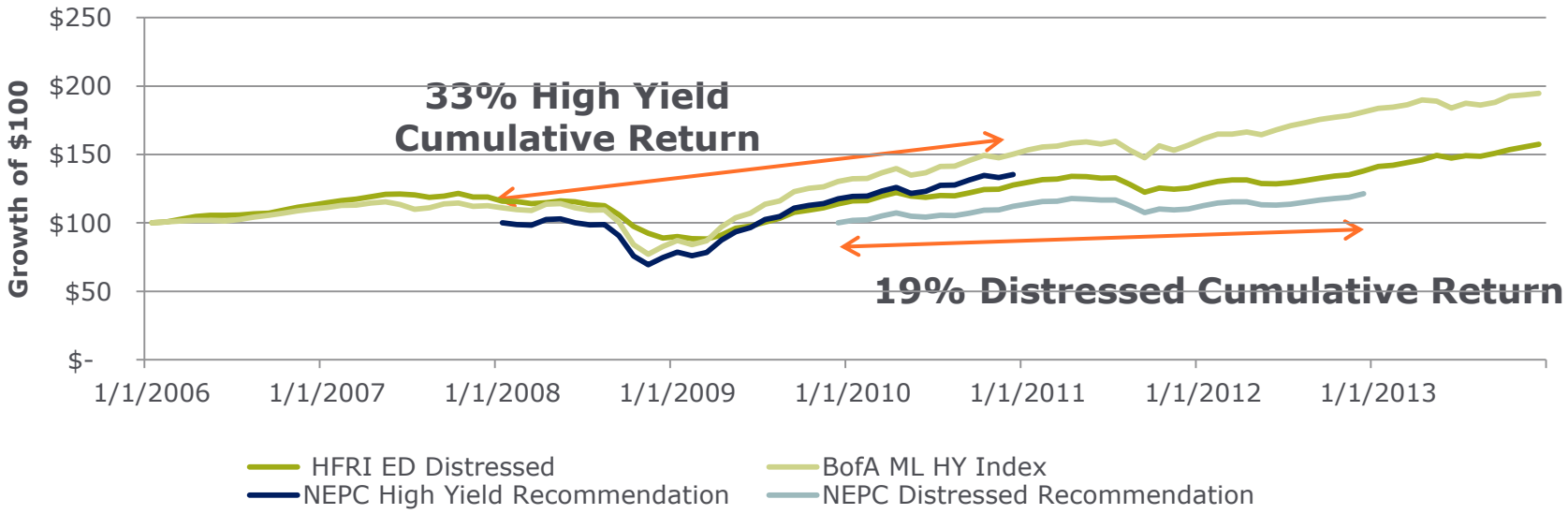
Fast forward to the end of 2009…

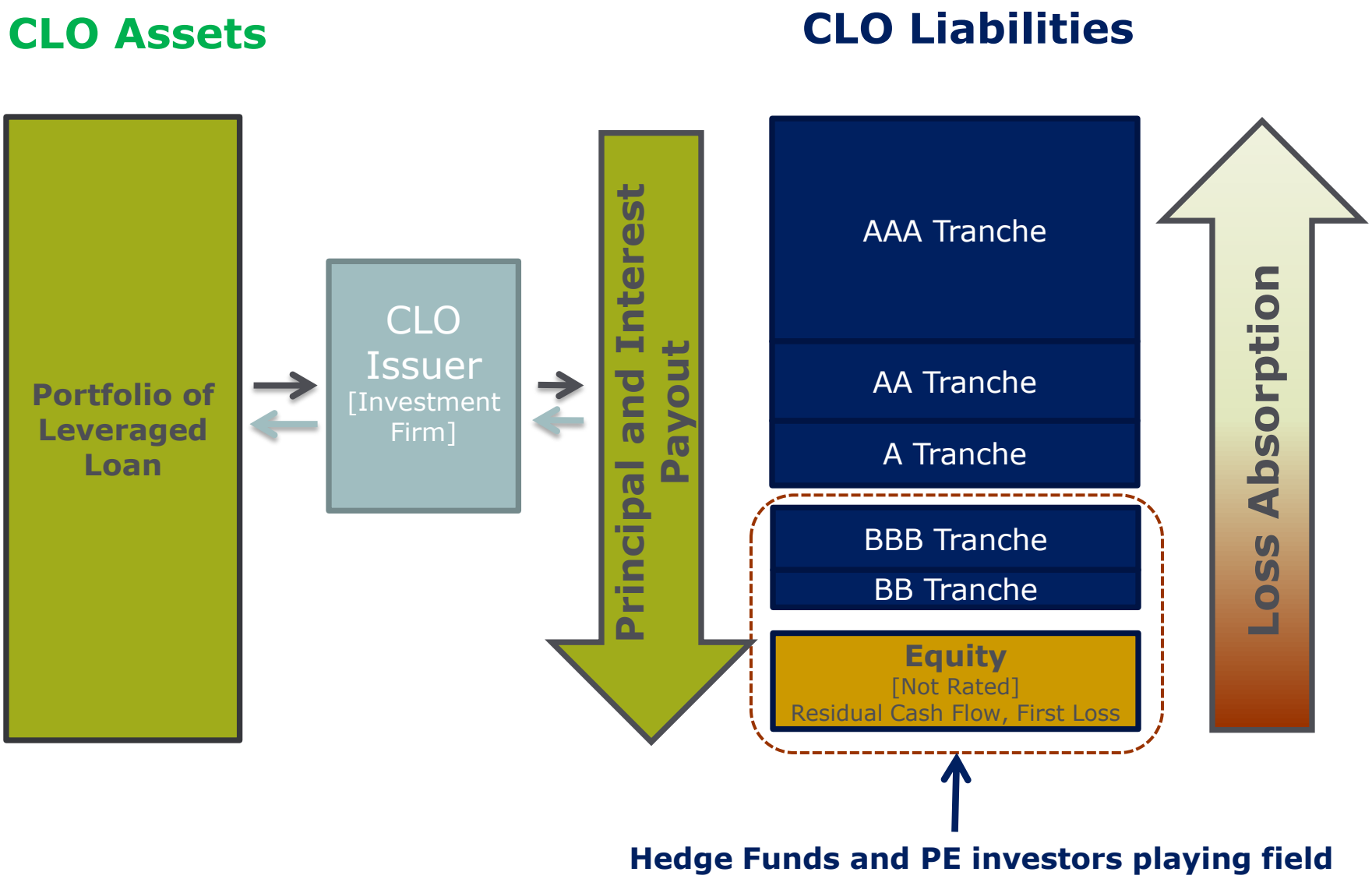


Methods of Executing an Opportunistic Strategy

- **When implementing an opportunistic position, we may recommend a traditional or alternative investment structure**
  1. **Long-Only Managers**
  2. **Less Liquid Managers (Hedge Fund Like Structure)**
  3. **Least Liquid Managers (Private Equity Like Vehicles)**

- **The recommended investment vehicle may evolve with the opportunity set**



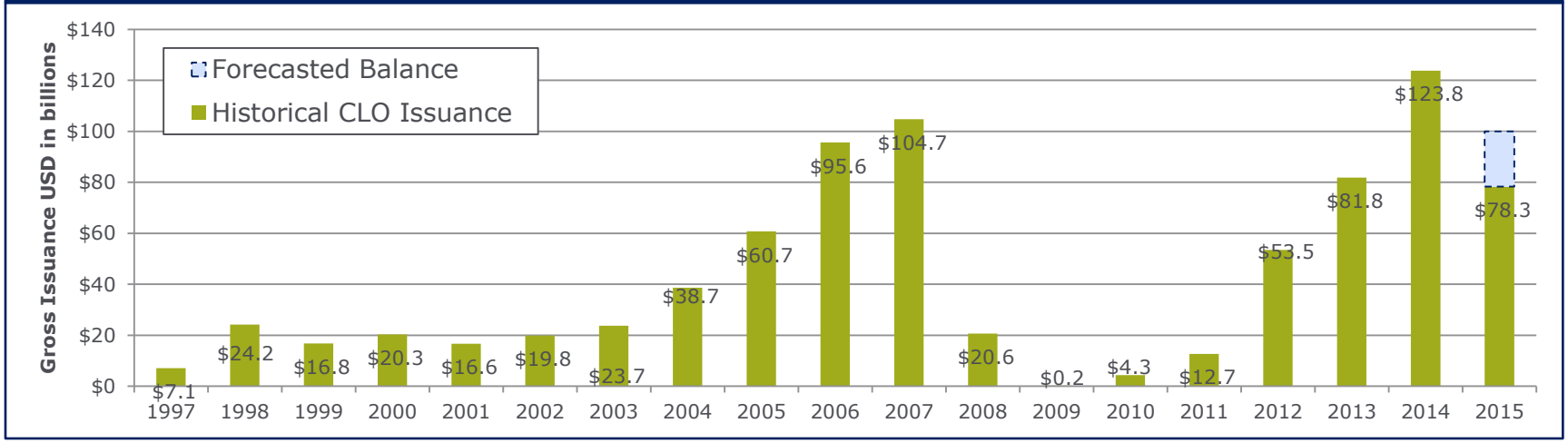

CLO Assets
CLO Liabilities
Portfolio of Leveraged Loan
CLO Issuer [Investment Firm]
Principal and Interest Payout
AAA Tranche
AA Tranche
A Tranche
BBB Tranche
BB Tranche
Equity
[Not Rated]
Residual Cash Flow, First Loss
Loss Absorption
Hedge Funds and PE investors playing field

CLO Outlook for 2016

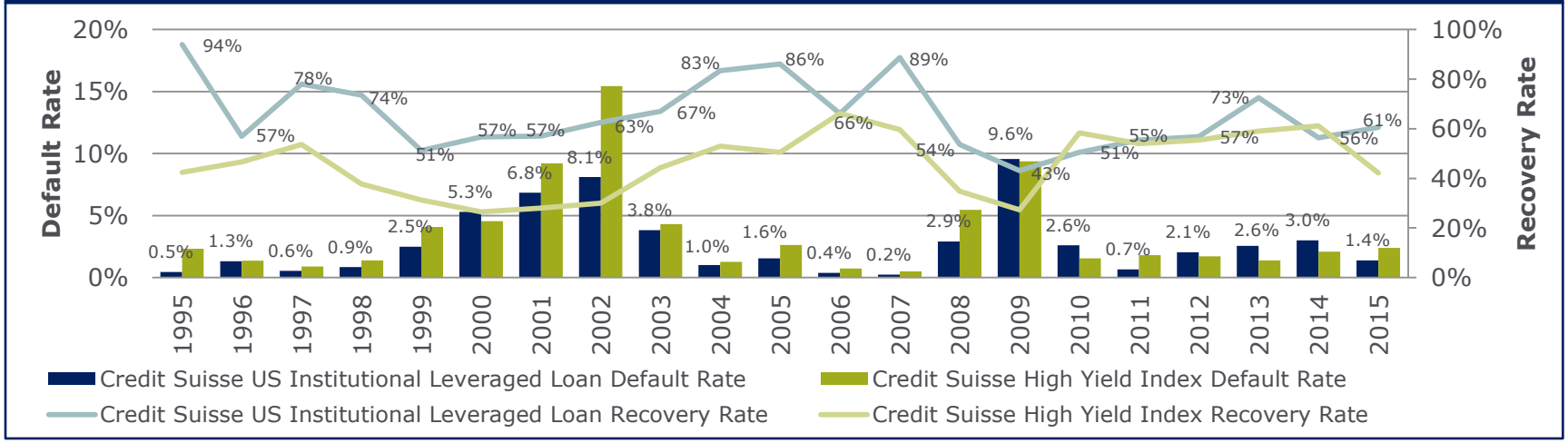
- **Anticipating that levered loan defaults remain low while market volatility remains elevated**
  - Recent sell-off presents an attractive entry point for secondary market
- **Secondary CLO Mezzanine (BB & B) is attractive**
  - Spreads are attractive relative to similarly-rated corporate issuances, with historically lower default rates. Sell-off of the second-half of 2015 was overdone
- **Equity Risk Retention ("ERR") Rules (aka skin-in-the-game) goes into effect in December 2016**
  - Anticipate manager consolidation as lower tier performers struggle to find ERR partners

CLO Issuance Slow but Healthy & Leveraged Loan Defaults Remain Low

CLO Issuance Down in 2015 Amidst Pending Regulations and Market Technicals



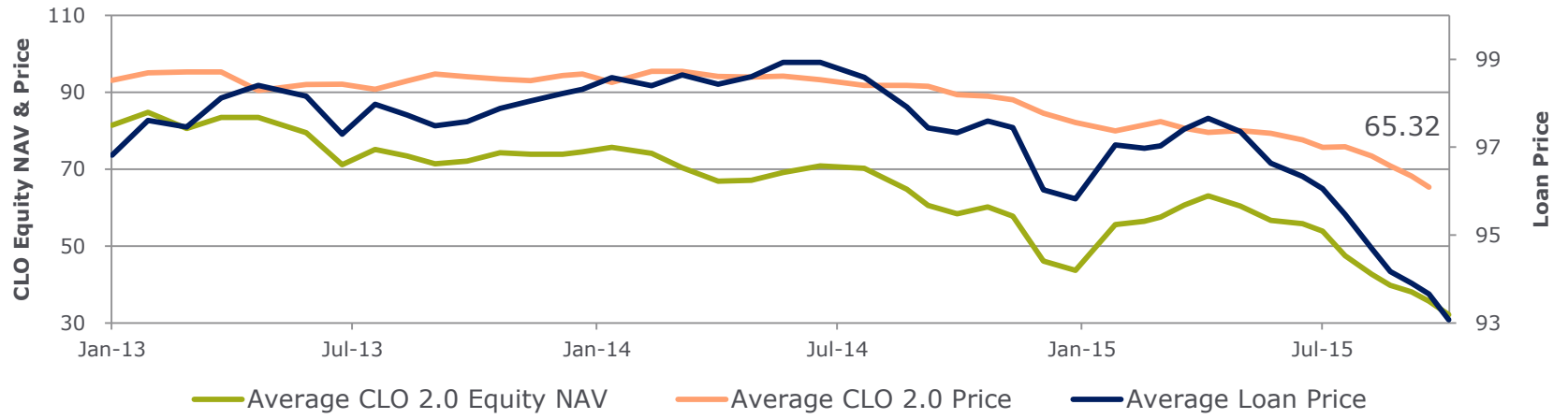
Leveraged Loan Defaults Remain Low



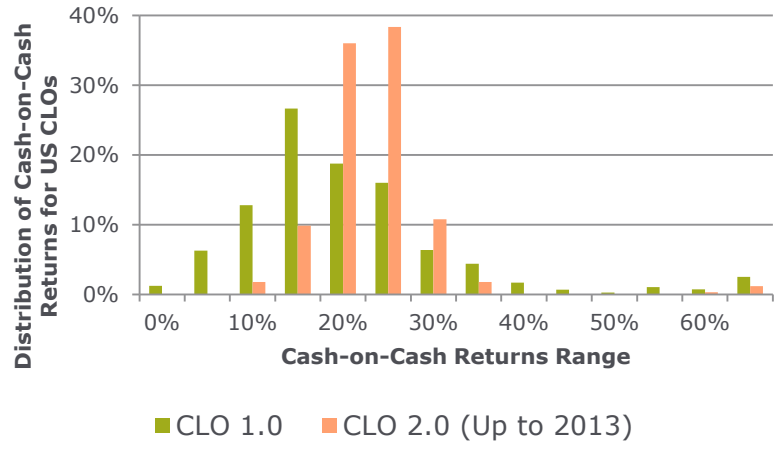
Source: Credit Suisse, S&P LCD, Intex, Moody's, Wells Fargo

CLO Equity Secondary Market Appears Compelling

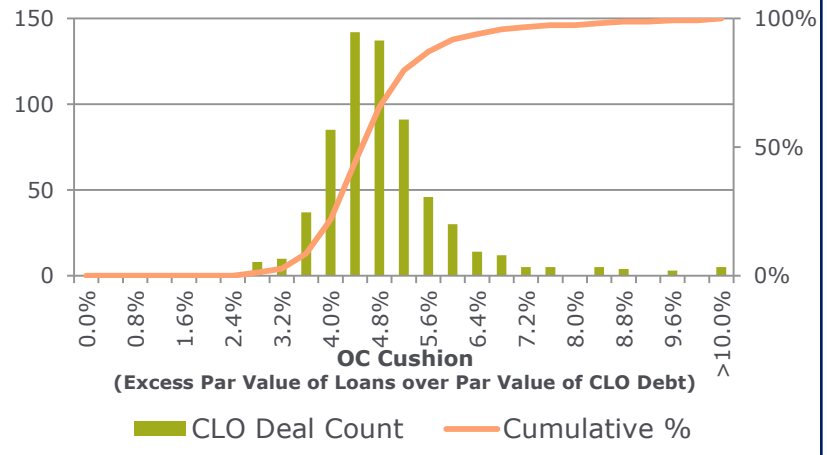
CLO 2.0 & 3.0 Equity Prices under Distress



but Cash-on-Cash Returns Still Attractive



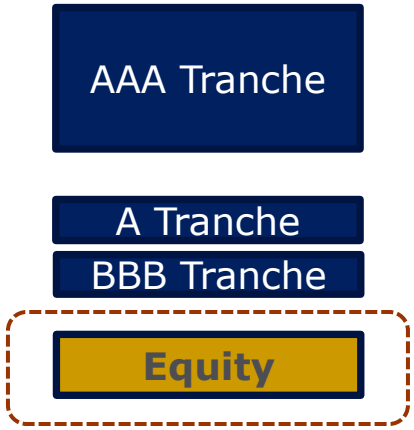
and Junior OC Cushions Appear Healthy



Source: BofA Merrill Lynch Global Research, S&P LCD, Intex

Eagle Point Credit Management

Strategic Focus: Credit-Linked: Structured Credit
Target Return: 16% - 19% Net IRR
Fund Terms: 3-year lock-up
NEPC Research Contact: Amanda Karlsson



- Eagle Point Credit is a hold-to-call, majority collateralized loan obligation (CLO) equity stake ownership strategy
- This strategy will benefit from their focus on sourcing and structuring majority equity stakes in the primary issue market
- This strategy is a best idea because NEPC believes this is the best approach to gain dedicated exposure to the CLO equity in the primary market

Asia Private Credit: A Structural Issue Affording a Secular Opportunity

Demand for Capital

- SMEs Ignored e.g. China, Australia etc.
- Prime Borrowers: Growth Capital-NO!

Structural Deficiency of Capital Markets

Supply of Capital

- Prop. Desks phasing out
- European banks retrenching
- High Yield Bonds-access for few
- CLO market-virtually non existent
- Chinese Trusts/Banks (WMPs) face regulatory scrutiny
- Local Relationships and Experience-high barrier to entry

Borrower WON'T Borrow Publicly

- Need to be discreet
- Have only offshore assets to pledge (local banks will not accept offshore assets)
- Establish a private source to parallel conventional channels
- Need to be groomed for public markets

Secular Opportunity for Private Credit i.e. Fast, Flexible and Discreet Capital!

OCP Asia - Orchard Landmark Fund

Strategic Focus: Private Credit
Geographic Focus: Asia
Target Return: 15%-20% Net IRR
Fund Terms: Evergreen Structure (3-year lock-up)
NEPC Research Contact: Kamal Suppal

- OCP Asia provides short-term credit to small and medium sized enterprises in Asia that are looking for growth capital
- The opportunity exists because of a persistent supply-demand imbalance amongst smaller enterprises that are unable to gain access to capital markets
- This strategy is a best idea because of the unique market need OCP is fulfilling, the team's strong deal-sourcing network, and long-track record (since 2004)
- NEPC anticipates this fund re-opening in early Fall

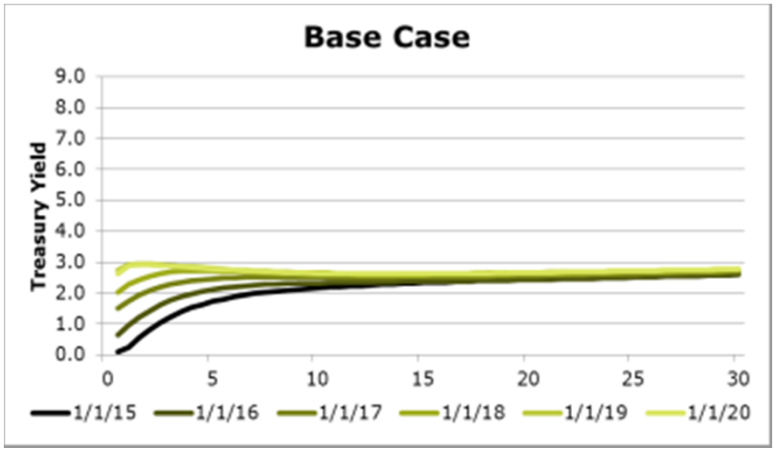
Not speculative…

- **Opportunities may not always exist, but when they do present themselves, it will be easiest to react if your portfolio is prepared to proactively respond**
- **The opportunistic allocation should be sized appropriately to make sure you can sleep at night but not so small that it is an irrelevant allocation**
- **Sometimes attractive opportunities become more attractive. Setting expectations with the investment committee may be appropriate**
- **Opportunistic investments above all else should offer high risk-adjusted returns**

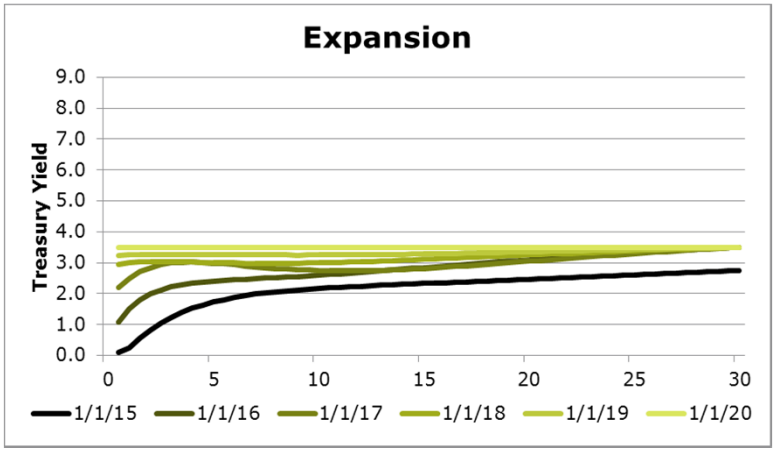
Appendix – Asset/Liability Analysis

Scenarios Considered

- **Base Case**
  - Asset returns over 5-year period in line with NEPC 2016 5-7 Year Assumptions
  - No volatility

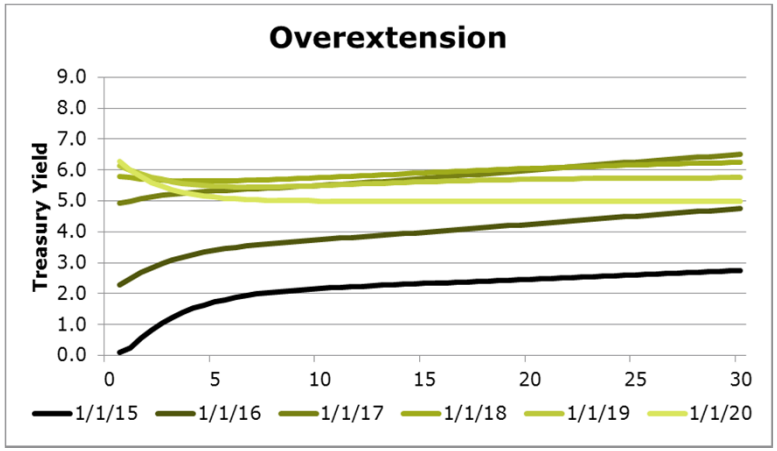


- **Expansion**
  - Economy is growing by a strong, but seemingly sustainable level
  - Bond yields are stable, inflation is manageable, equities and other high volatility asset classes perform quite well in this environment
  - Historical example: 2004-2006
  - *Large cap equities time-series: 10%, 17%, 28%, 12%, 10%*

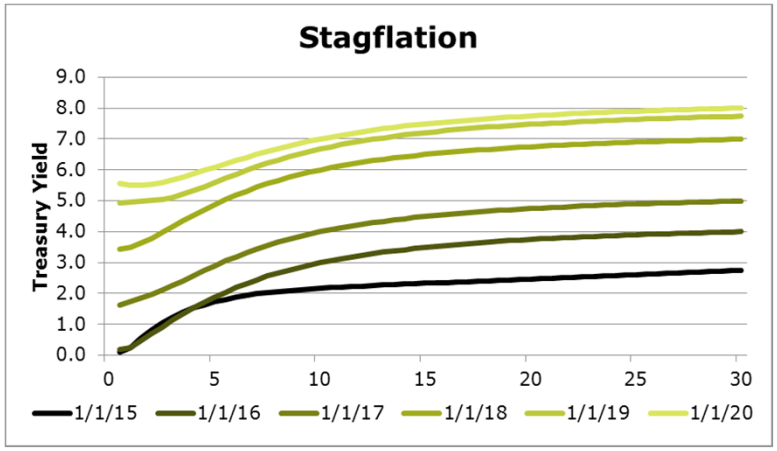


Scenarios Considered

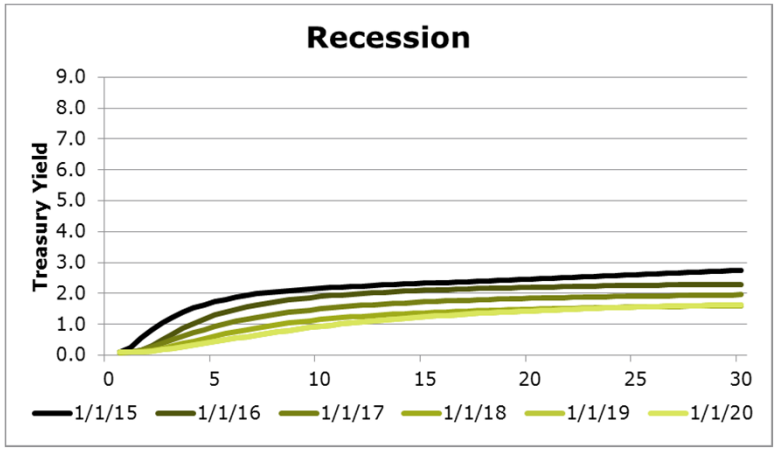
- **Overextension**
  - Economy is growing at a rapid pace, inflation increases significantly – booming times but at the cost of future growth
  - Bond yields move higher as a result of inflation; high yield does well with confidence in the economy
  - Equities, real estate, and commodities fuel rapid expansion
  - Historical example: Vietnam War era (1967-1971)
  - *Large cap equities time-series: 12%, 16%, 0%, 12%, 16%*



- **Stagflation**
  - Two problems – (1) the economy is not growing, (2) inflation has skyrocketed
    - Inflation is sticky – once it gets high, it stays high for several years
    - Fed has limited options to kick-start economy because easing only promotes further inflation
  - Equities sag; bonds lose real value; real assets such as TIPS perform well on a relative basis because they are linked to inflation
  - Historical example: flat stock market and double digit inflation of the mid-1970s
  - *Large cap equities time-series: -8%, -12%, -15%, 9%, 12%*



- **Recession**
  - Economy stalls – there is a flight to quality as investors lose confidence
    - Equity markets fall
    - Bond yields fall
  - Interest-sensitive securities (bonds, especially long duration bonds) will perform well in this environment
  - Historical example: early 1990s
  - *Large cap equities time-series: -8%, -18%, -8%, 4%, -10%*



Development of Asset Class Assumptions

- **We use November 30 market data for all asset class assumptions**

- **Combination of historical data and forward looking analysis**
  - Expected returns based on current market pricing and forward looking estimates
  - Volatility and correlations based on history, while recognizing current uncertainty

- **Historical data is used to frame current market environment as well as to compare to similar historical periods**
  - Incorporates historical index returns, volatility, correlations, valuations, and yields

- **Forward-looking analysis is based on current market pricing and a building blocks approach**
  - Return equals yield + changes in price (valuation, defaults, etc.)
  - Use of key economic observations (inflation, real growth, dividends, etc.)
  - Structural themes (supply and demand imbalances, capital flows, etc.)

- **Assumptions prepared by Asset Allocation Committee**
  - Asset Allocation team plus members of various consulting practice groups meet to develop themes and assumptions
  - Public markets, hedge fund and private market research teams provide insights

- **Assumptions and Actions reviewed and approved by Partners Research Committee**

Inflation

- **Inflation is an integral component of our asset allocation assumptions**
  - An essential building block for projecting returns in stocks, bonds, and commodities
- **There are several measures of inflation used to inform our view, all with some type of shortcoming**
  - Global forecasts, local consumer and producer price indices, TIPS break-even inflation
- **Institutional investment pools will experience asset inflation globally, encompassing both developed and emerging countries**
  - We use a 3% global inflation forecast over 5-7 years for our equity building blocks
    - Akin to assuming purchasing power parity holds across markets
  - Can be different from inflation experienced in local country liabilities or spending needs
    - Our expectation of U.S. CPI is 2.25% over 5-7 years and 2.75% over 30 years
- **Muted credit growth leaves inflation expectations unchanged in the near term, pressure for higher long-term inflation continues to build**
  - Money supply (M2) continued to expand while velocity remains depressed
  - Global monetary policy likely to remain stimulative in 2016
- **Given long-term inflation pressures, a modestly higher inflation assumption (3.25%) is used for determining 30 year equity return expectations**

Themes for 2016 Asset Class Assumptions

- **5-7 year return expectations moderately higher among global equity and credit assets relative to prior year**
  - Expected return outlook broadly remains subdued
  - Recent performance of emerging markets leads to increase in expectations
  - Expectations of slow Fed policy tightening reduce cash forecasts
  - Increase in expectations for credit markets reflect higher credit spread levels
  - Hedge Fund expectations unchanged but incorporate anticipation of greater divergences across and within global markets

- **30-year returns have similar themes to 5-7 year forecasts**
  - Lower cash assumption flows through to long-term fixed income returns
  - Equity market assumptions largely unchanged

- **Volatility expectations reduced incrementally in certain asset classes**
  - Private Market reductions echo normalized environment and asset class experience
  - Volatility for emerging markets and commodities increased to reflect probability of higher risk moments

2016 5-to-7 Year Return Forecasts

Geometric Expected Return			
Asset Class	**2015**	**2016**	**2016-2015**
Cash	1.75%	1.50%	-0.25%
Treasuries	1.75%	1.75%	
IG Corp Credit	3.25%	3.75%	0.50%
MBS	2.00%	2.00%	
*Core Bonds**	*2.30%*	*2.46%*	0.16%
TIPS	2.25%	2.50%	0.25%
High-Yield Bonds	4.00%	5.25%	1.25%
Bank Loans	4.50%	5.50%	1.00%
Global Bonds (Unhedged)	1.00%	1.00%	
Global Bonds (Hedged)	1.13%	1.09%	-0.04%
EMD External	4.50%	4.75%	0.25%
EMD Local Currency	5.50%	6.50%	1.00%
Large Cap Equities	6.00%	6.00%	
Small/Mid Cap Equities	6.00%	6.25%	0.25%
Int'l Equities (Unhedged)	7.00%	7.25%	0.25%
Int'l Equities (Hedged)	7.39%	7.57%	0.18%
Emerging Int'l Equities	9.00%	9.75%	0.75%
Private Equity	8.50%	8.50%	
Private Debt	7.50%	7.50%	
Private Real Assets	8.00%	8.25%	0.25%
Real Estate	6.50%	6.50%	
Commodities	5.25%	4.50%	-0.75%
Hedge Funds	5.75%	5.75%	

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).

2016 30-Year Return Forecasts

Geometric Expected Return			
Asset Class	**2015**	**2016**	**2016-2015**
Cash	3.25%	3.00%	-0.25%
Treasuries	3.50%	3.25%	-0.25%
IG Corp Credit	4.75%	5.00%	0.25%
MBS	3.75%	3.50%	-0.25%
*Core Bonds**	*3.98%*	*3.89%*	*-0.09%*
TIPS	4.00%	4.00%	
High-Yield Bonds	5.75%	5.75%	
Bank Loans	6.00%	6.00%	
Global Bonds (Unhedged)	2.25%	2.75%	0.50%
Global Bonds (Hedged)	2.41%	2.87%	0.46%
EMD External	6.00%	6.00%	
EMD Local Currency	6.75%	6.50%	-0.25%
Large Cap Equities	7.50%	7.50%	
Small/Mid Cap Equities	7.75%	7.75%	
Int'l Equities (Unhedged)	8.00%	8.00%	
Int'l Equities (Hedged)	8.47%	8.39%	-0.08%
Emerging Int'l Equities	9.25%	9.50%	0.25%
Private Equity	9.50%	9.50%	
Private Debt	8.00%	8.00%	
Private Real Assets	7.75%	7.75%	
Real Estate	6.50%	6.50%	
Commodities	5.75%	5.50%	-0.25%
Hedge Funds	6.75%	6.50%	-0.25%

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).

2016 Volatility Forecasts

Volatility			
Asset Class	**2015**	**2016**	**2016-2015**
Cash	1.00%	1.00%	
Treasuries	5.50%	5.50%	
IG Corp Credit	7.50%	7.50%	
MBS	7.00%	7.00%	
*Core Bonds**	*6.03%*	*6.03%*	
TIPS	7.50%	6.50%	-1.00%
High-Yield Bonds	13.00%	13.00%	
Bank Loans	8.00%	9.00%	1.00%
Global Bonds (Unhedged)	9.00%	8.50%	-0.50%
Global Bonds (Hedged)	5.00%	5.00%	
EMD External	12.00%	13.00%	1.00%
EMD Local Currency	15.00%	15.00%	
Large Cap Equities	17.50%	17.50%	
Small/Mid Cap Equities	21.00%	21.00%	
Int'l Equities (Unhedged)	21.00%	21.00%	
Int'l Equities (Hedged)	17.50%	18.00%	0.50%
Emerging Int'l Equities	26.00%	27.00%	1.00%
Private Equity	27.00%	18.00%	-9.00%
Private Debt	17.00%	10.00%	-7.00%
Private Real Assets	23.00%	20.00%	-3.00%
Real Estate	15.00%	15.00%	
Commodities	18.00%	19.00%	1.00%
Hedge Funds	9.00%	9.00%	

*Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).
**Volatility adjusted year-over-year to reflect smoothing methodology.

2016 Correlations

Asset Class	Cash	Treas	Credit	MBS	TIPS	HY	Glob Bonds	Glob (H)	EMD (Ext)	EMD (Loc)	Large Cap	Sm/ Mid	Intl Eq	Intl Eq (H)	EM Eq	Priv Eq	Priv Debt	Priv Real	Real Estate	Cmdy	Hedge Funds
Cash	1.00																				
Treasuries	0.20	1.00																			
IG Corp Credit	0.10	0.65	1.00																		
MBS	0.25	0.90	0.75	1.00																	
TIPS	0.00	0.65	0.60	0.70	1.00																
High-Yield Bonds	-0.05	0.20	0.55	0.30	0.20	1.00															
Global Bonds (Unhedged)	0.10	0.50	0.50	0.45	0.40	0.10	1.00														
Global Bonds (Hedged)	0.15	0.80	0.65	0.70	0.65	0.20	0.60	1.00													
EMD (External)	0.05	0.35	0.65	0.35	0.30	0.60	0.25	0.35	1.00												
EMD (Local Currency)	0.05	0.30	0.60	0.25	0.25	0.60	0.30	0.25	0.80	1.00											
Large Cap Equities	-0.10	-0.10	0.45	0.10	0.00	0.65	0.00	-0.10	0.55	0.65	1.00										
Small/Mid Cap Equities	-0.15	-0.15	0.45	0.10	-0.10	0.70	-0.05	-0.15	0.55	0.60	0.90	1.00									
Int'l Equities (Unhedged)	-0.10	0.00	0.30	0.05	-0.05	0.65	0.35	0.00	0.60	0.70	0.70	0.60	1.00								
Int'l Equities (Hedged)	0.00	0.00	0.30	0.05	-0.05	0.65	0.05	0.00	0.60	0.65	0.75	0.65	0.85	1.00							
Emerging Int'l Equities	-0.10	-0.10	0.25	-0.10	-0.10	0.70	0.05	-0.05	0.70	0.80	0.60	0.65	0.70	0.70	1.00						
Private Equity	-0.20	-0.15	0.30	0.10	-0.10	0.60	-0.15	-0.20	0.35	0.40	0.70	0.75	0.60	0.65	0.45	1.00					
Private Debt	0.00	-0.35	0.15	-0.15	-0.10	0.65	-0.10	-0.10	0.50	0.60	0.60	0.65	0.75	0.75	0.80	0.65	1.00				
Private Real Assets	0.15	-0.20	0.05	-0.15	0.00	0.40	-0.05	-0.05	0.40	0.40	0.55	0.60	0.50	0.50	0.50	0.65	0.60	1.00			
Real Estate (Core)	0.25	-0.05	0.15	0.05	0.10	0.25	0.05	-0.05	0.20	0.30	0.40	0.40	0.35	0.40	0.30	0.50	0.40	0.40	1.00		
Commodities	0.10	-0.10	0.10	-0.10	0.30	0.20	0.10	-0.10	0.35	0.45	0.30	0.30	0.35	0.35	0.40	0.25	0.30	0.45	0.30	1.00	
Hedge Funds	0.00	-0.20	0.35	-0.15	0.20	0.60	0.05	-0.20	0.55	0.60	0.60	0.65	0.70	0.65	0.70	0.75	0.80	0.65	0.25	0.50	1.00

Disclosures

- **NEPC, LLC is an investment consulting firm. We provide asset-liability studies for certain clients but we do not provide actuarial services. Any projections of funded status or contributions contained in this report should not be used for budgeting purposes. We recommend contacting the plan's actuary to obtain budgeting estimates.**

- **The goal of this report is to provide a basis for substantiating asset allocation recommendations.**

- **The projection of liabilities in this report uses standard actuarial projection methods and does not rely on actual participant data. Asset and liability information was received from the plan's actuary, and other projection assumptions are stated in the report.**

- **Assets are projected using a methodology chosen by the client. Gains and losses are estimated through investment returns generated by applying NEPC's 5-7 year asset class assumptions and scenario assumptions for the current year.**

- **This report is based on forward-looking assumptions, which are subject to change.**

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