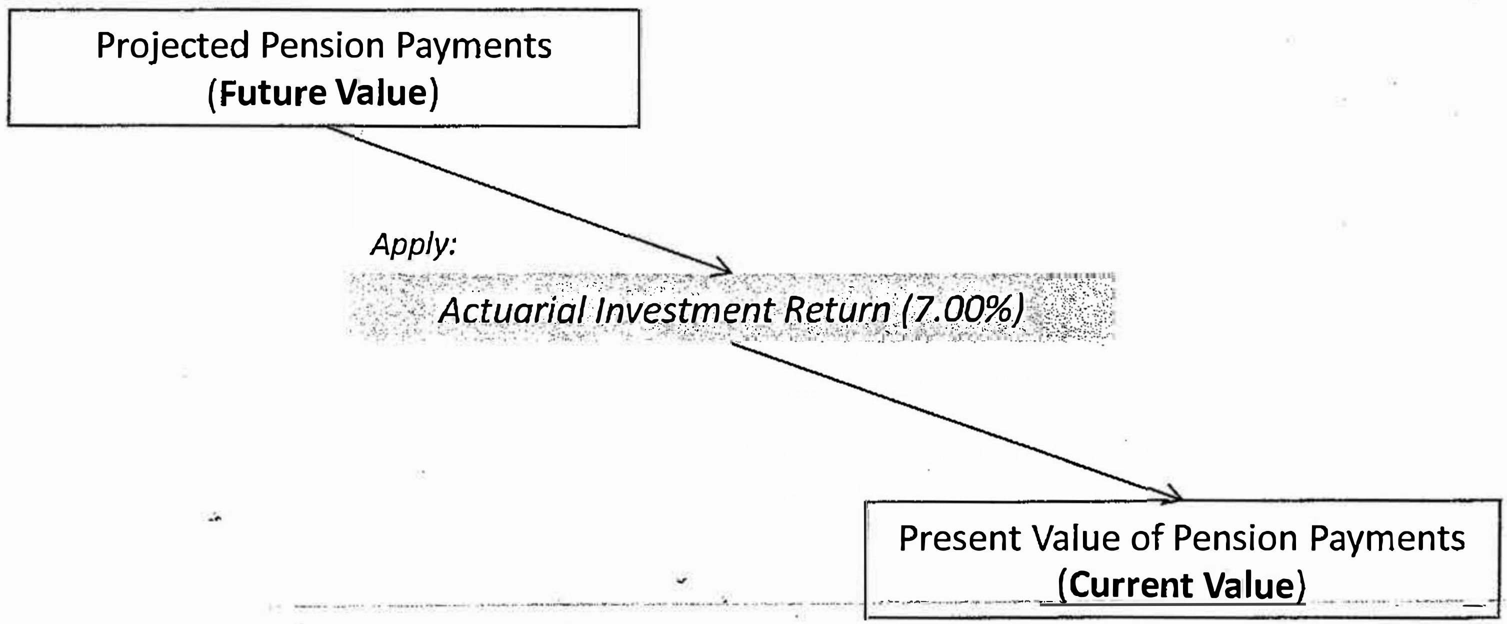
BACKGROUND

What is our liability?

- Pension payments for Firemen's Retirement System of St. Louis (FRS) members for service through February 1, 2013.

How is it calculated?

- Set formula (Years, Salary, etc.)
- Actuarial Assumptions (Retirement, Mortality, etc.)



CURRENT SITUATION

Projected Pension Payments: $1.3 Billion
(through 2115)

Apply: *7.00% Investment Return (Discount Rate)*

Present Value of Pension Payments → $510 Million (2015)

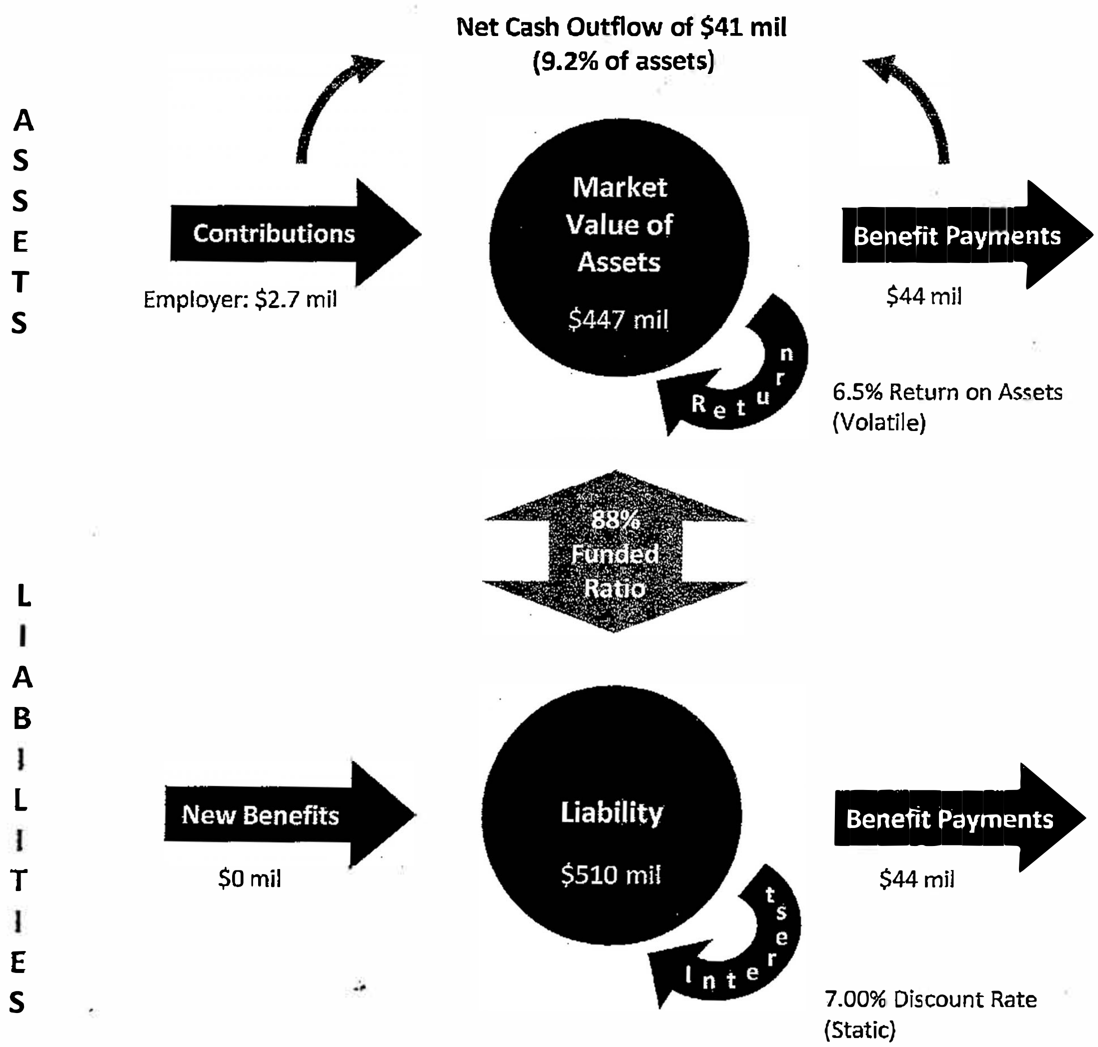
Market Value of Assets → $447 Million (2015)

88% Funded Status

Market Value Grows By:

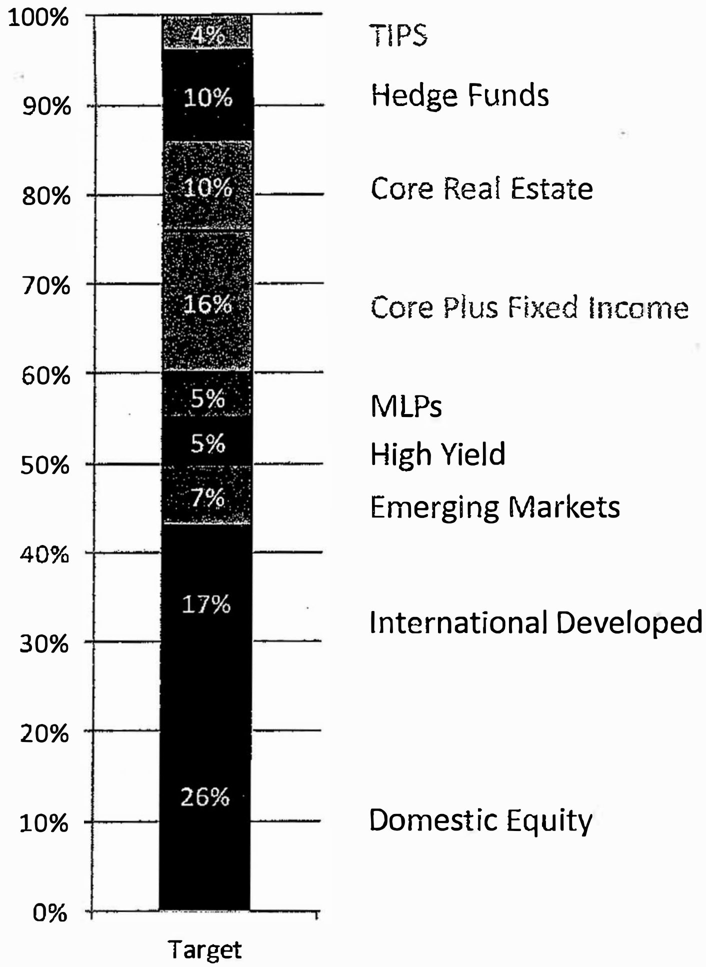
1. *Actual Investment Return*
2. *Employer/Employee Contributions*

PLAN SNAPSHOT



- The illustration to the left shows the status of the FRS Pension Plan as of October 1, 2015 and expected flows for the plan year.
- Assets decline as benefits are paid or from negative investment returns. Assets increase as contributions are made and from positive investment returns.
- Net cash outflow is the difference between benefit payments and contributions. This amount must be covered by investment earnings or liquidation of assets.
- The liability declines as benefits are paid and increases over time by the discount rate.
  - Since the Plan is frozen, no new benefits are earned.

CURRENT TARGET ASSET ALLOCATION

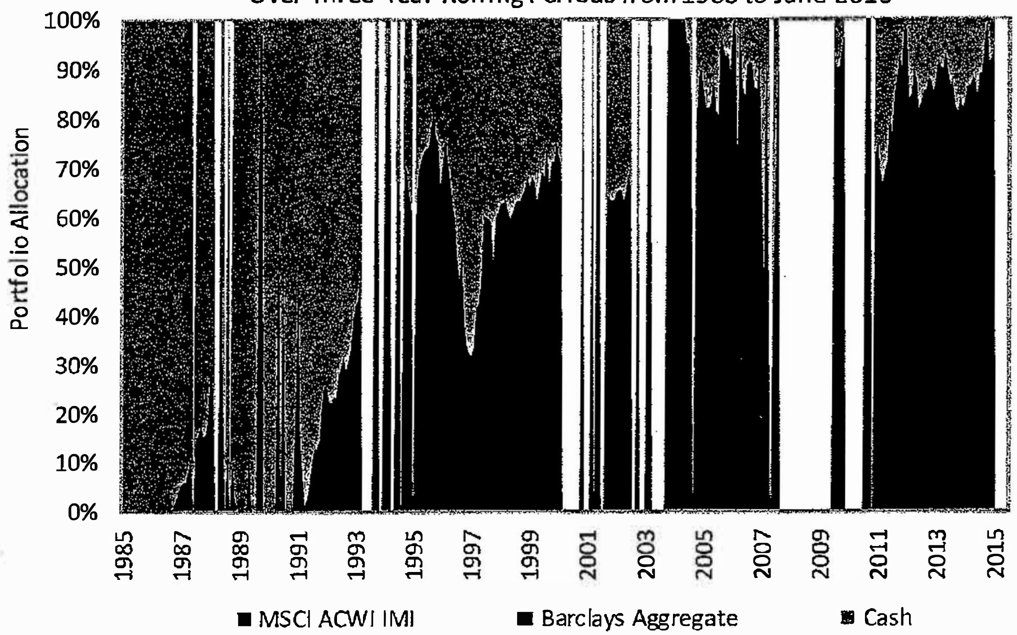


10-year Beta Expected Return	6.0%
10-year Alpha Expected Return	0.5%
10-year Total Expected Return	6.5%
Standard Deviation	10.6%
Return/Risk	0.61

- The Target Allocation has an expected return and standard deviation of 6.5% and 10.6%, respectively.
- There is no allocation to illiquid assets.

EARNING 7% HAS BECOME MORE CHALLENGING

Lowest Volatility Portfolio to Achieve 7.0% Return
Over Three Year Rolling Periods from 1985 to June 2016



Asset Allocation- Three Years Ending:	12/31/1985	12/31/2000	12/31/2015
MSCI ACWI IMI	0%	23%	87%
Barclays Agg.	0%	49%	7%
Cash	100%	28%	6%
Total Weight	100%	100%	100%
Std. Dev.	0.3%	4.1%	9.5%

For the three years ending December 1985, 100% cash earned 7+%...

...while recently more risk has been required to achieve return targets.

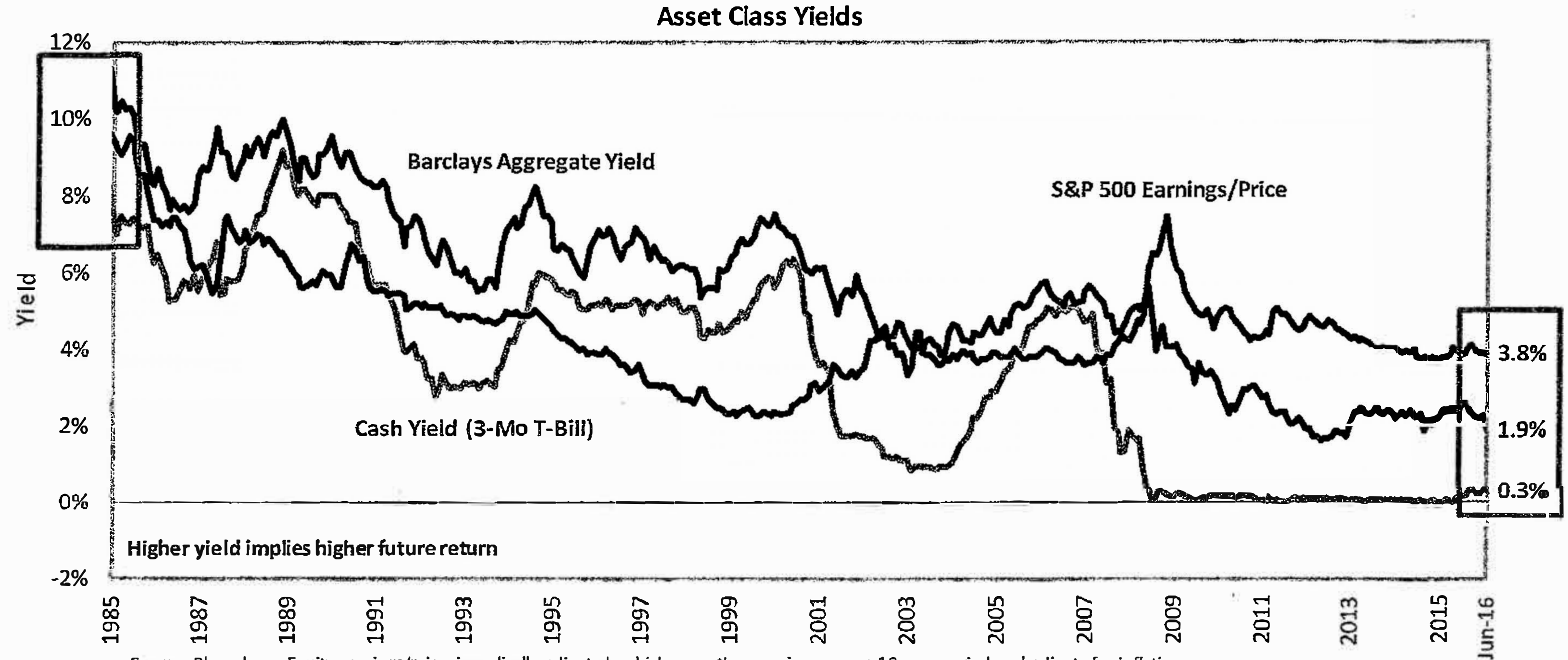
Case study:

- Looking back historically, examine portfolios that have returned 7% per year over rolling three year periods while minimizing risk.

Observations:

- Essentially no risk was required to earn 7% 30 years ago, as short-term interest rates were high but have recently drifted down to zero.
- As bond and cash yields have moved lower, so have the returns they produce.
- As a result, riskier assets like stocks have become increasingly necessary to meet return targets.
- Additionally, there have been more periods where no combination of stocks/bonds/cash produced a 7% return.
  - For the three years ending June 30, 2016, no combination of ACWI/Barclays Aggregate/Cash achieved a 7% annual return.

WHY RETURNS HAVE BEEN HARDER TO COME BY



Source: Bloomberg. Equity earnings/price is cyclically-adjusted, which smoothes earnings over a 10-year period and adjusts for inflation.

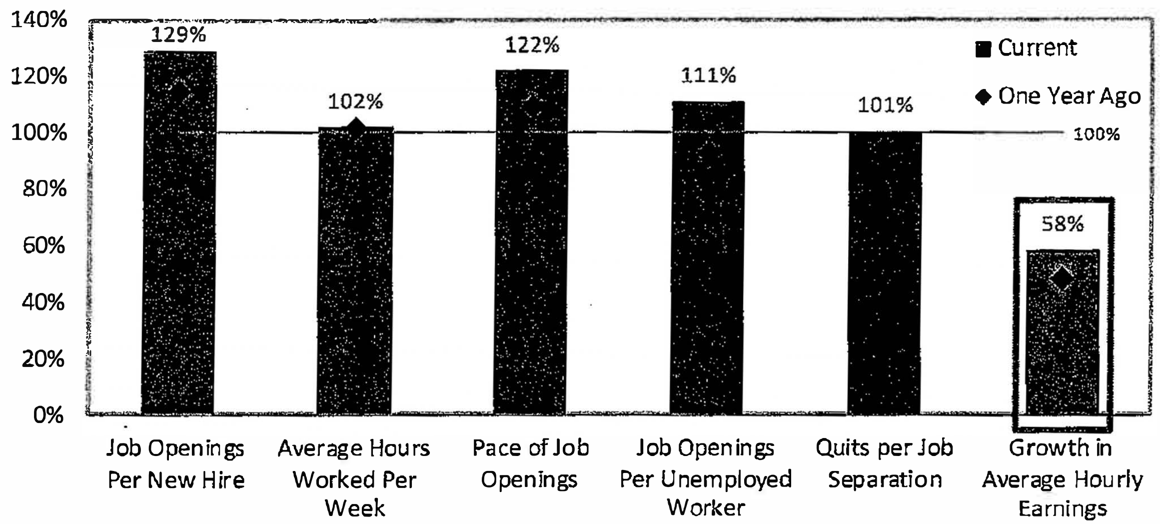
Why is today perceived as a low return environment?

- With cash yields near zero and core bond yields near all-time lows, their contributions to portfolio returns will be less than they have been historically.
- As equity valuations have increased, the yields stocks offer investors have also come down.

WHY INFLATION EXPECTATIONS SHOULD CURRENTLY BE HIGHER

- The labor market has continued to strengthen as many indicators have recovered and now exceed pre-crisis levels.
- Wage growth, the main driver of inflation, has lagged.
  - However, wage growth appears to have bottomed and will likely accelerate as long as jobs continue to be added.
  - It is estimated that 50,000 to 100,000 new jobs per month should keep the unemployment rate steady and continue to pressure wages.

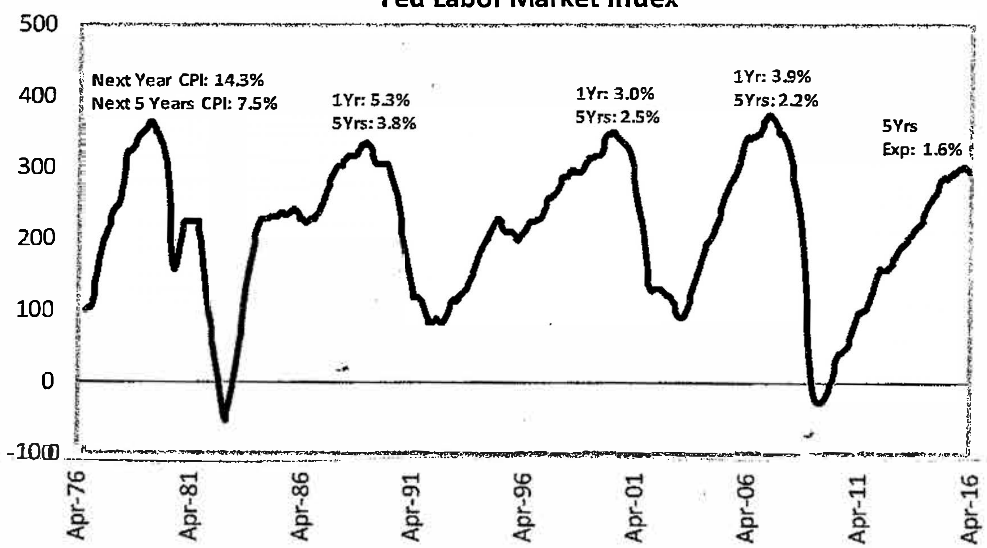
Labor Market Metrics: Current vs. Pre-Crisis Levels



Current Levels as a % of January 2007 Levels

Source: Federal Reserve Bank of St. Louis, Bureau of Labor Statistics

Fed Labor Market Index



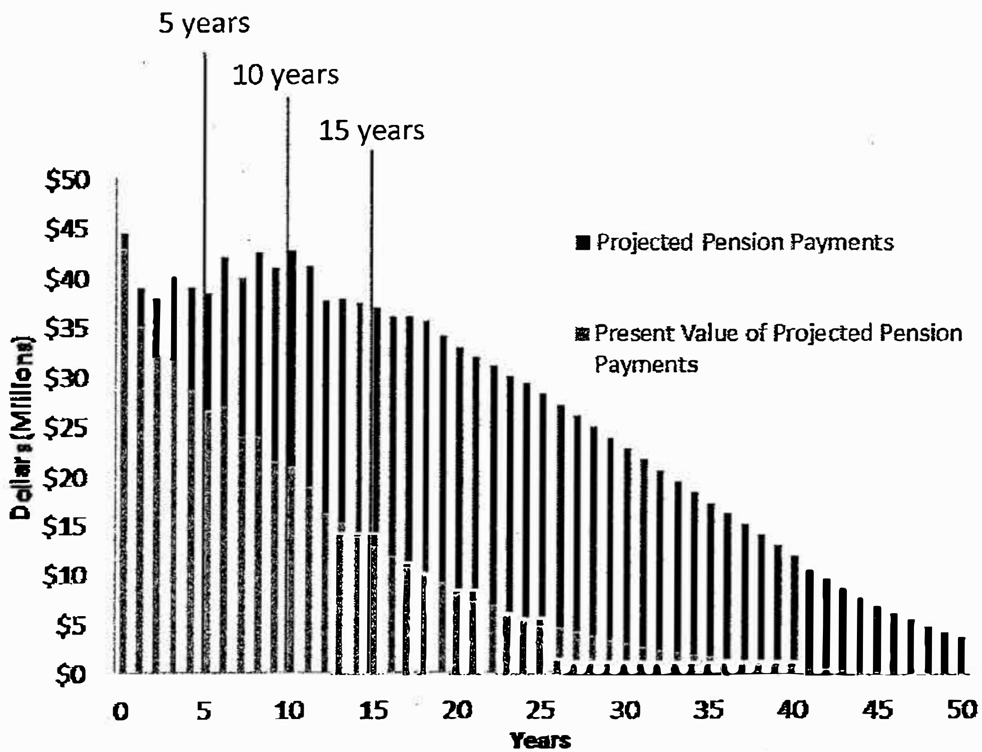
Source: Bloomberg.

- The Labor Market Conditions Index published by the Federal Reserve tracks 19 indicators and is nearing historical peak levels.
- At each of the previous peak levels for the Index, inflation over the next one- and five-year periods has exceeded what is currently priced into the market (1.6% over the next five years).
- Our base case expectation is that we have likely not reached the peak for this cycle despite a recent slowdown in the Index.

CURRENT SITUATION

	10/1/2015
Present Value of Future Benefits	$510
Market Value of Assets (MVA)	$447
Funded Status (MVA/PBO)	88%
Investment Return (Discount Rate)	7.00%

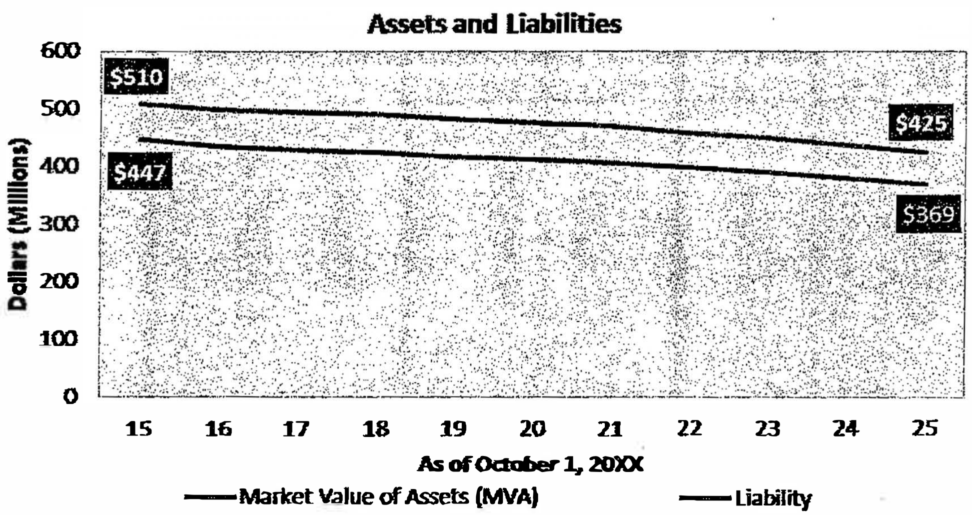
- The Plan is frozen (no future service accruals).
- At 10/1/2015, the Plan was 88% funded.
  - Assets of $447 M
  - Liability of $510 M

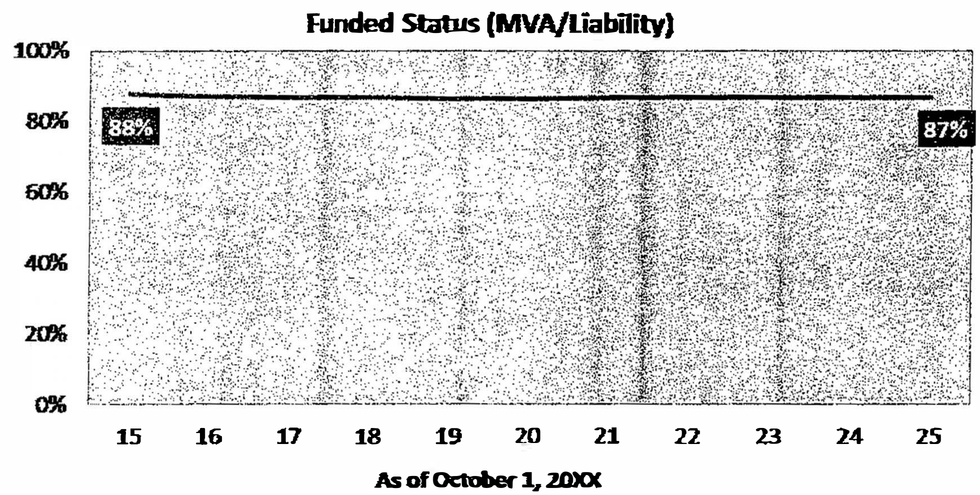


- The charts to the right illustrate the Plan's projected pension payments as of 10/1/2015.
- Almost 60% of the discounted pension payments and 30% of the undiscounted pension payments are paid out over the next 10 years.
  - 75% and 45%, respectively, are paid in the next 15 years.

	Projected Pension Payments	Present Value of Projected Pension Payments
Total	$1,345	$510
5-Years ($)	$201	$171
5-Years (%)	15%	33%
10-Years ($)	$404	$293
10-Years (%)	30%	58%
15-Years ($)	$600	$378
15-Years (%)	45%	74%

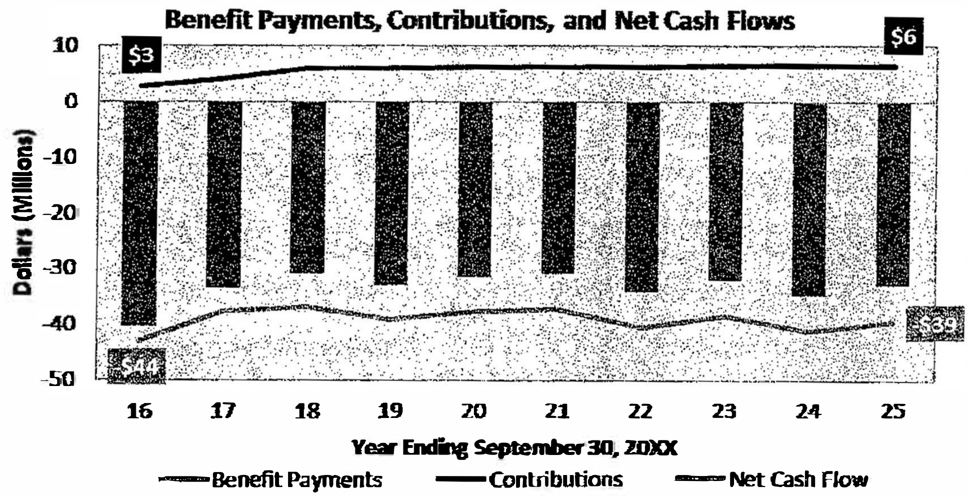
BASELINE PROJECTION

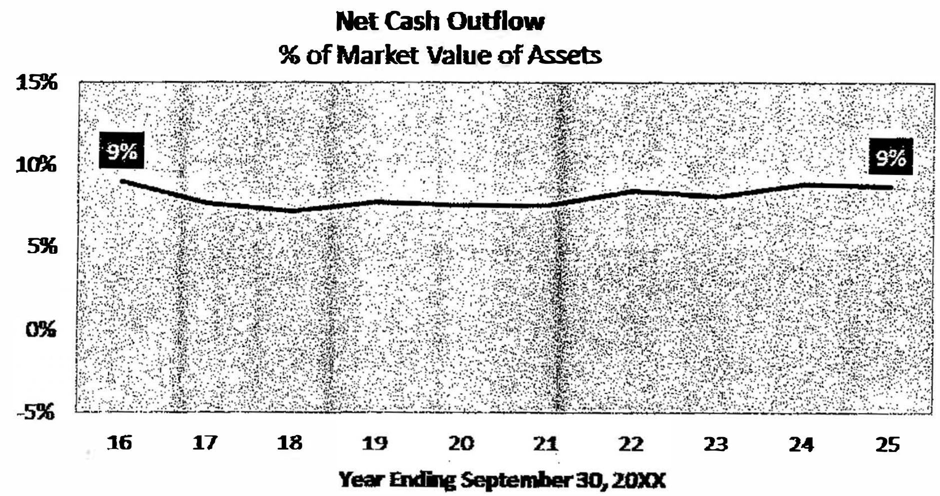




- The baseline projection assumes the assets return 6.5% each year, which is the 10-year expected return of the current Target Portfolio using capital market assumptions (including manager alpha).
  - Note: Entry Age Normal cost method is used to determine contribution requirement. This differs slightly from the actuary's methodology due to data constraints.
- The unfunded liability will continue to widen if the assets don't keep up with the investment return assumption of 7.0%.
- Funded status falls from 88% as of 10/1/2015 to 87% by the end of the projection period.

BASELINE PROJECTION



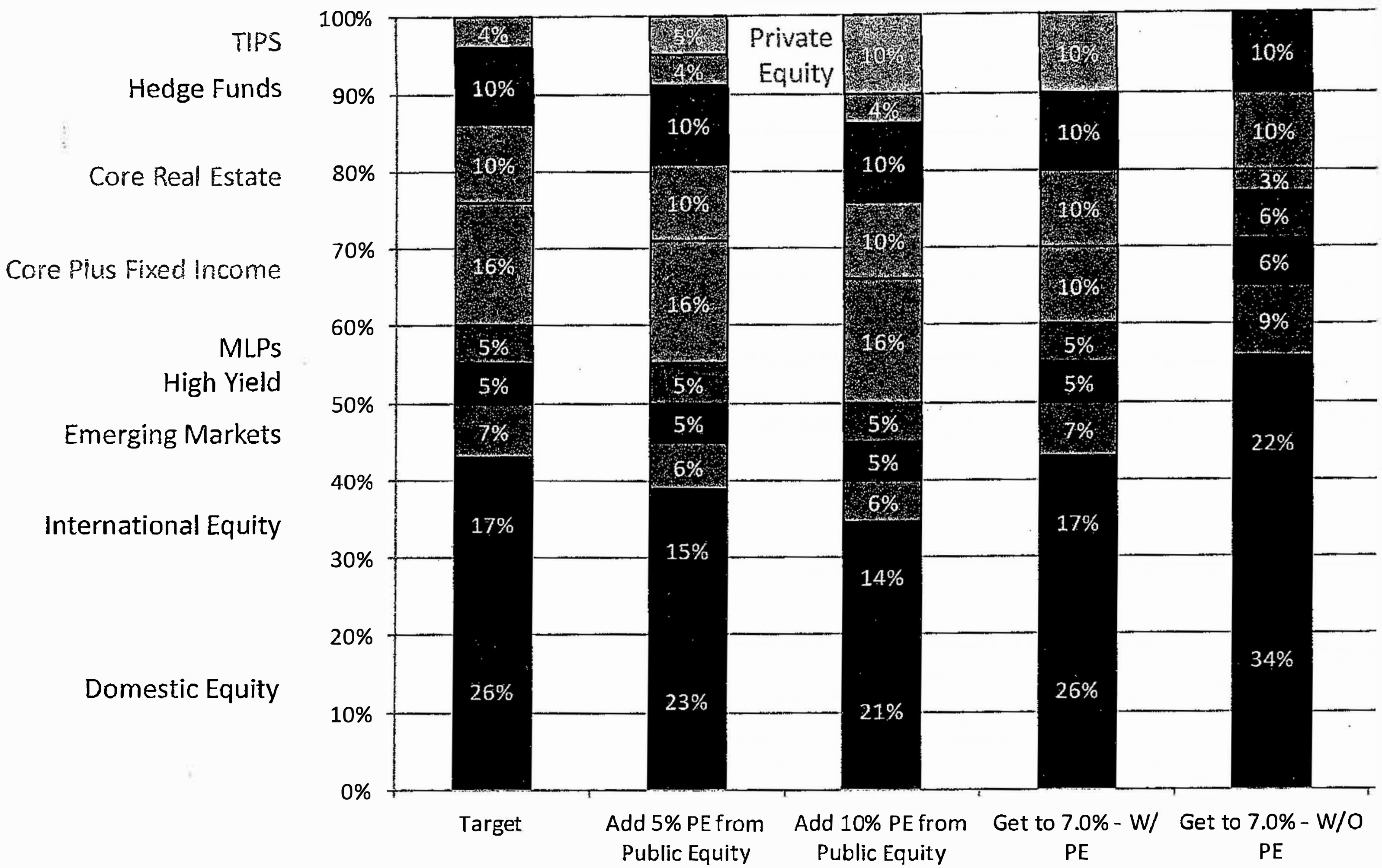


- The plan is expected to be in a persistent negative cash flow situation.
  - Annual net cash liquidity (benefit payments in excess of contributions) is expected to be approximately 9% of assets, thus portfolio liquidity is a concern.
    - Cumulative contributions over the 10-year projection period are $57 million.
    - Cumulative benefits paid over the 10-year projection period are $404 million.

Assumptions: Annual return of 6.5%, investment return assumptions stable at current 7.0%, contributions computed in accordance with EAN cost method.

Firemen's Retirement System of St. Louis

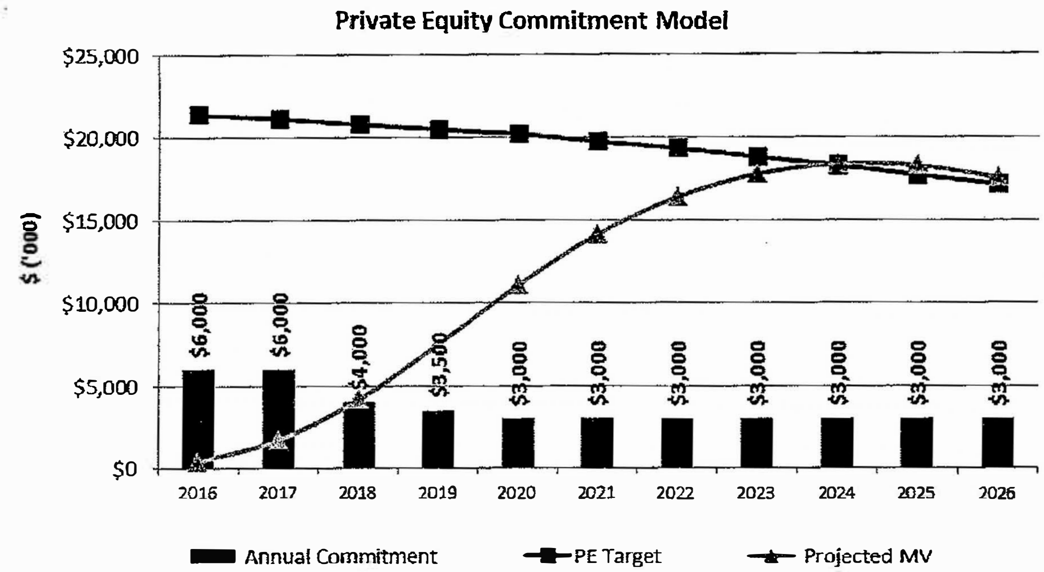
PORTFOLIO CONSIDERATIONS

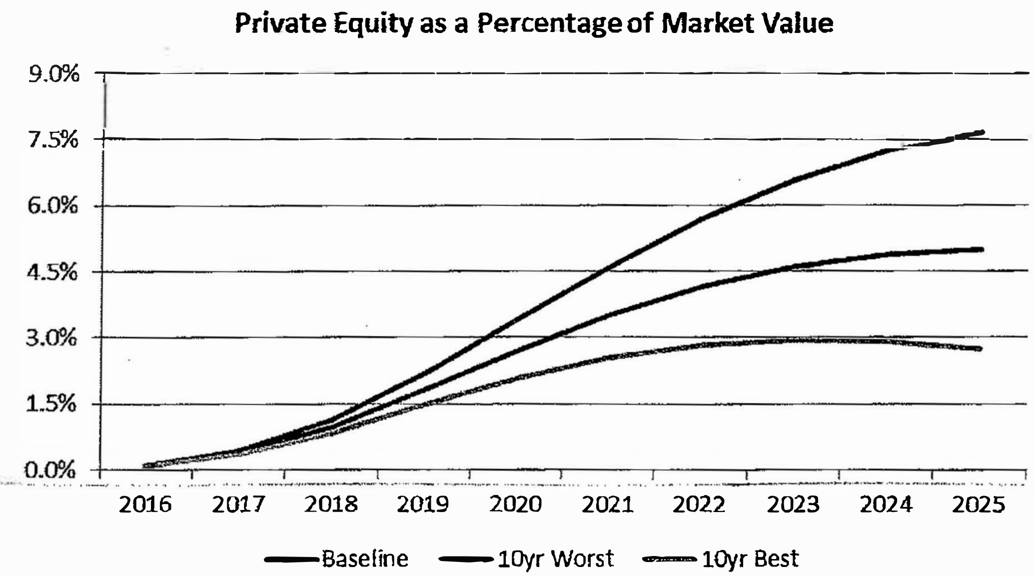


	Target	Add 5% PE from Public Equity	Add 10% PE from Public Equity	Get to 7.0% - W/ PE	Get to 7.0% - W/O PE
10-year Beta Expected Return	6.0%	6.1%	6.2%	6.5%	6.5%
10-year Alpha Expected Return	0.5%	0.5%	0.6%	0.6%	0.5%
10-year Total Expected Return	6.5%	6.6%	6.8%	7.1%	7.0%
Standard Deviation	10.6%	10.4%	10.3%	12.1%	13.5%
Return/Risk	0.61	0.64	0.66	0.59	0.52

LIQUIDITY – 5% PRIVATE EQUITY

- The private equity commitment model is based on the market value from the baseline projection and a 5% target to private equity.
  - The private equity allocation target has a negative slope because the portfolio is expected to fall from negative cash flows.
- The chart below assumes calculates the portfolio illiquidity if the historical 10-year worst and best annualized return occurs.
  - The 10-year best and worst annualized returns are 11.7% (1999) and 1.8% (2008).
  - It assumes the commitments calculated above are funded.
- At the end of 2025, there is still $9 million of uncalled private equity commitments. This implies the portfolio could be 11.3% illiquid in the worst case scenario.



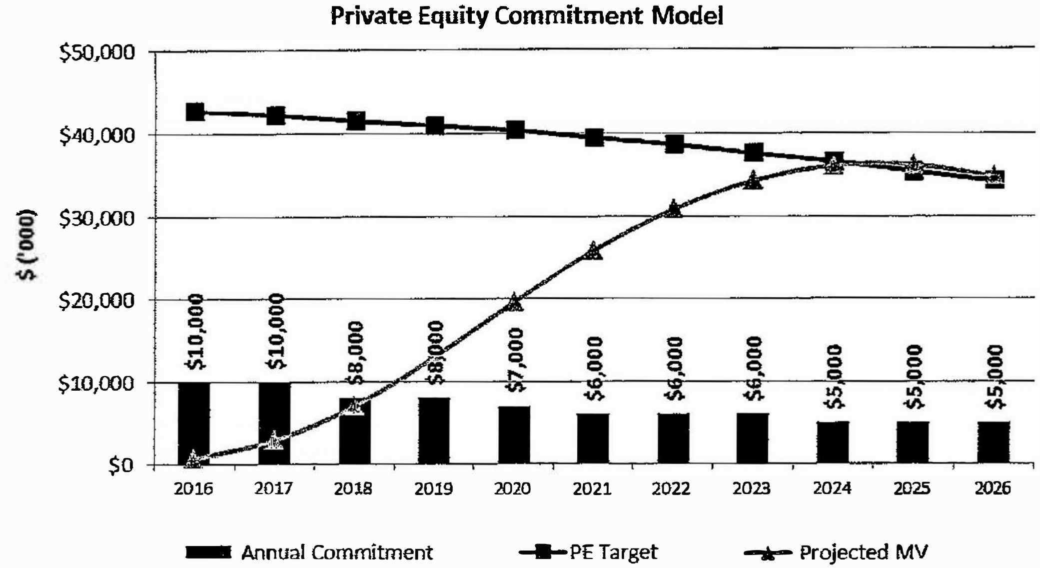


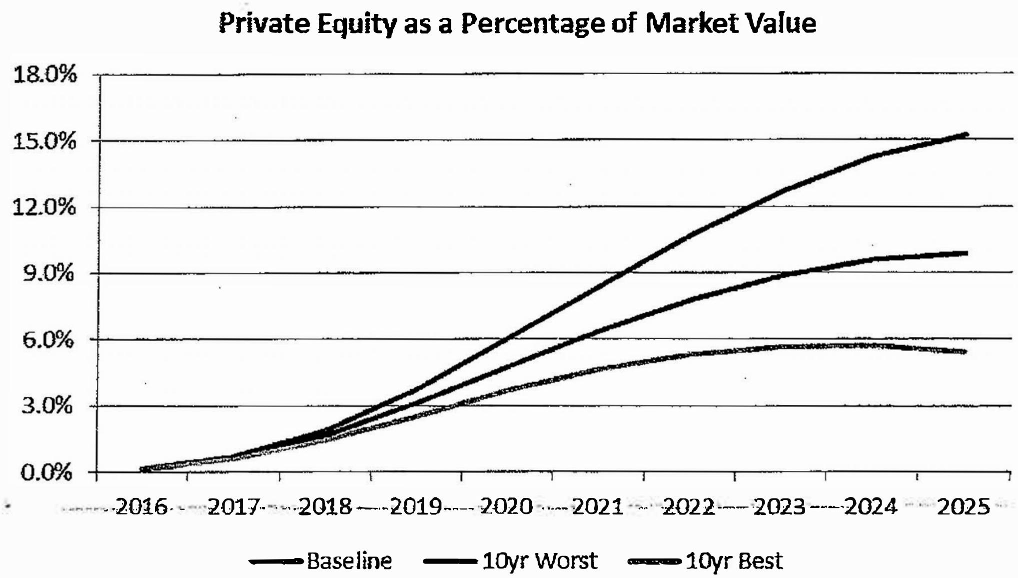
LIQUIDITY – 10% PRIVATE EQUITY

- The private equity commitment model is based on the market value from the baseline projection and a 10% target to private equity.
  - The private equity allocation target has a negative slope because the portfolio is expected to fall from negative cash flows.

- The chart below assumes calculates the portfolio illiquidity if the historical 10-year worst and best annualized return occurs.
  - The 10-year best and worst annualized returns are 11.7% (1999) and 1.8% (2008).
  - It assumes the commitments calculated above are funded.

- At the end of 2025, there is still $16 million of uncalled private equity commitments. This implies the portfolio could be 21.7% illiquid in the worst case scenario.





BASELINE CONCLUSIONS

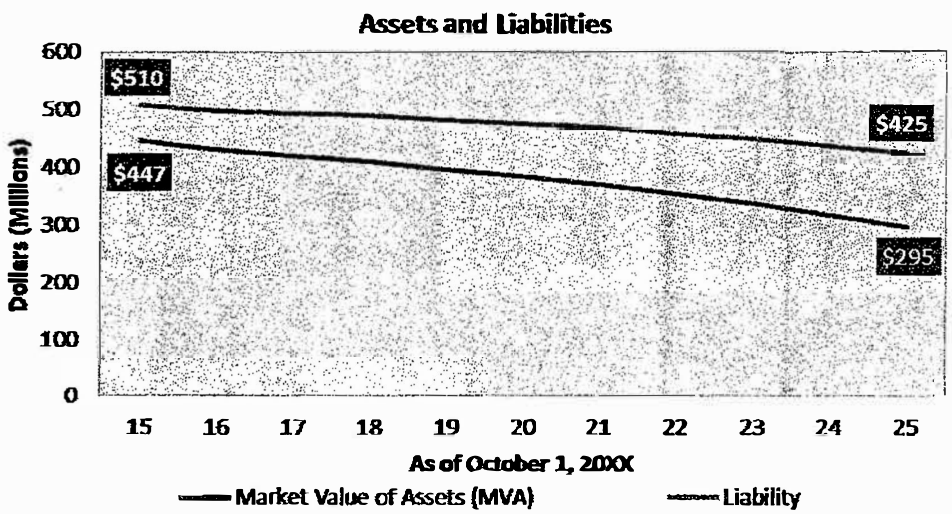
- The Firemen's Retirement System of St. Louis currently has an 88% funded status on a market-value-of-assets to actuarial-accrued-liability basis.

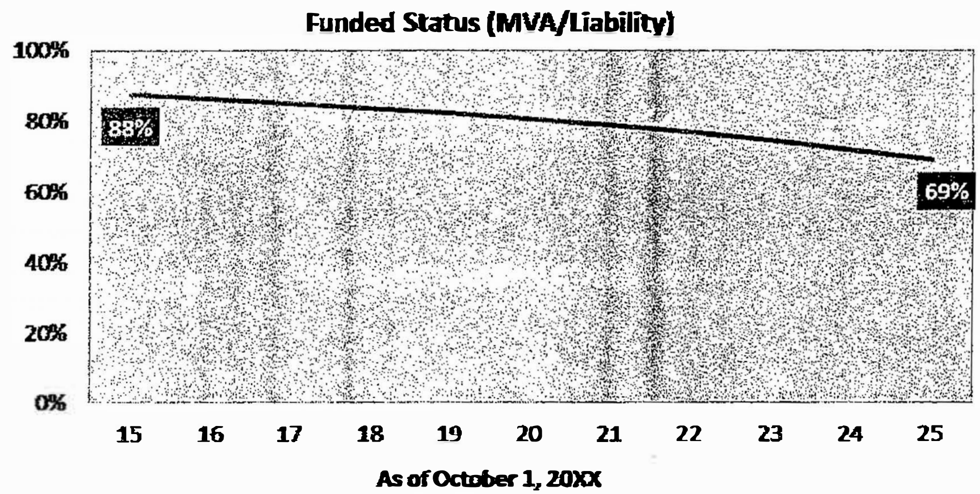
- Funded status is expected to decrease slightly to 87% over the next ten years, assuming:
  - The baseline investment return of 6.5% per year is earned in the second and subsequent years.
  - Pension liability grows at 7% per year.
  - Projected employer contributions are made.

- Lower investment returns lead to higher contributions and lower funded status. Conversely, higher investment returns lead to lower contributions and higher funded status.

- Cash outflows are stable but relatively high over the projection period.
  - Liquidity needs of the FRS remain at the "high" range of reasonable throughout the projection period, and we do not recommend further restricting liquidity at this time.

BASELINE PROJECTION – ALTERNATIVE SCENARIO (NO CONTRIBUTIONS)

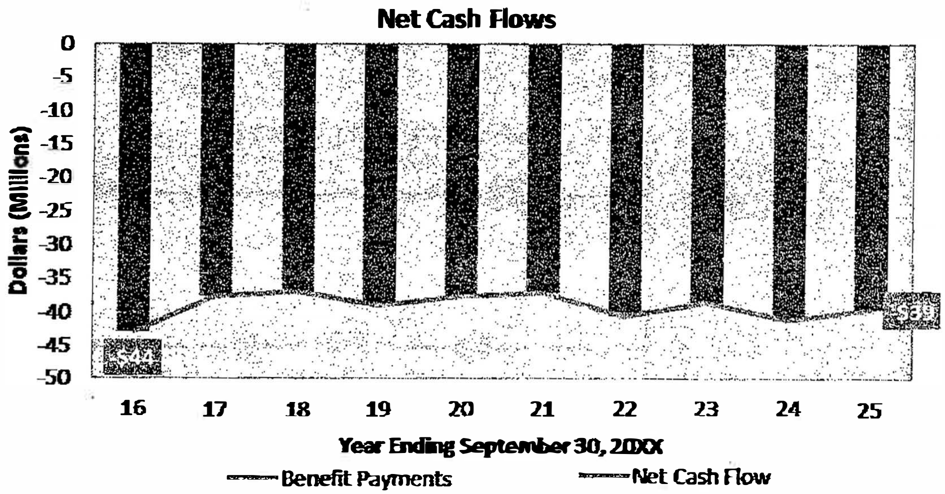


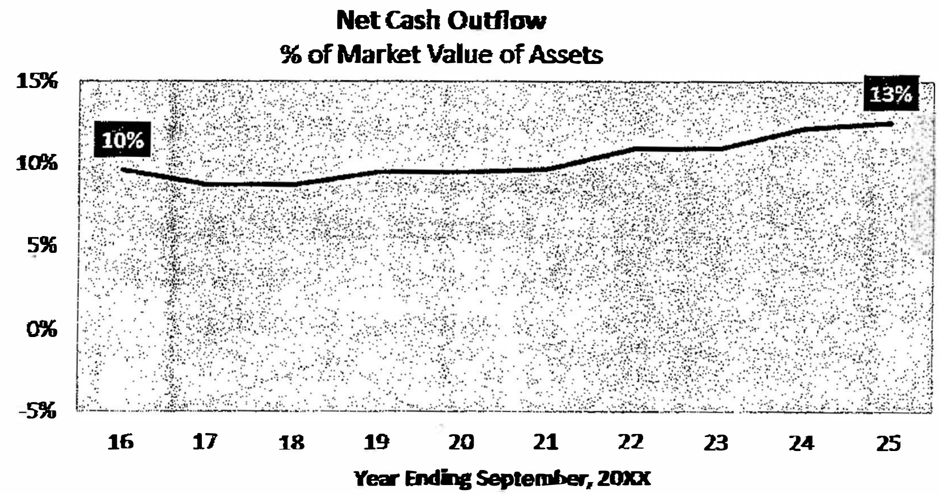


- Without contributions and asset returns less than the 7.0% investment return, the unfunded liability is expected to widen and funded status falls from 88% to 69% by the end of the projection period.

Assumptions: Annual return of 6.5%, investment return assumptions stable at current 7.0%, contributions are $0.

BASELINE PROJECTION – ALTERNATIVE SCENARIO (NO CONTRIBUTIONS)





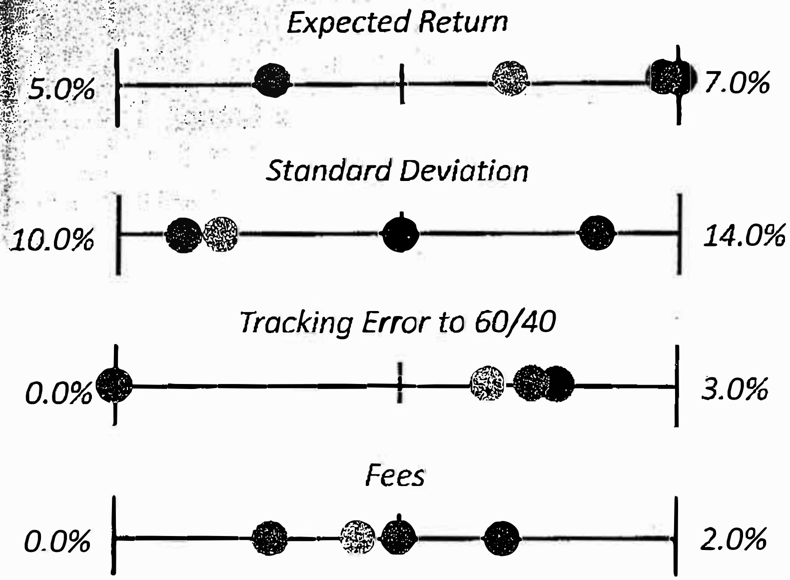
- Annual cash outflows are expected to be between 10% and 13% of the of assets.

- The Plan's ability to invest in illiquid assets is limited by persistent cash outflows and no contributions to provide additional liquidity.

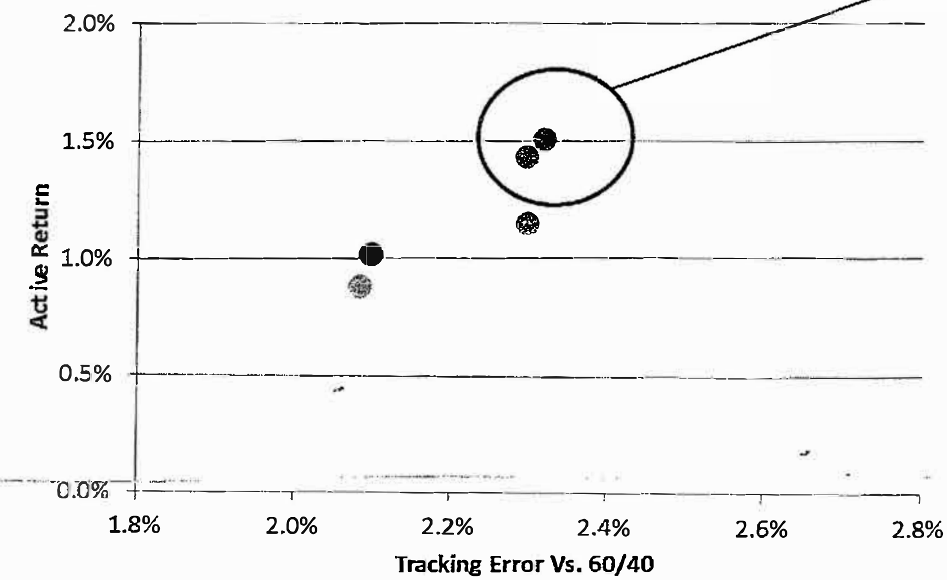
Assumptions: Annual return of 6.5%, investment return assumptions stable at current 7.0%, contributions are $0.

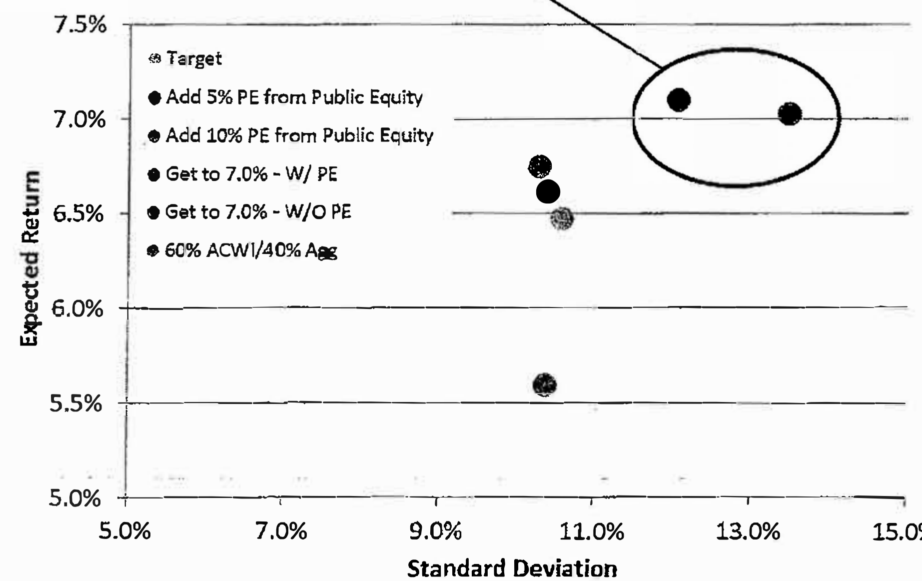
Firemen's Retirement System of St. Louis

PORTFOLIO TRADE-OFFS



Increasing the allocation to riskier assets increases expected return but also increases tracking error versus a more traditional portfolio.





FRAMING THE ASSET ALLOCATION DECISION MAKING PROCESS

Portfolios

Target

Add 5% PE from Public Equity

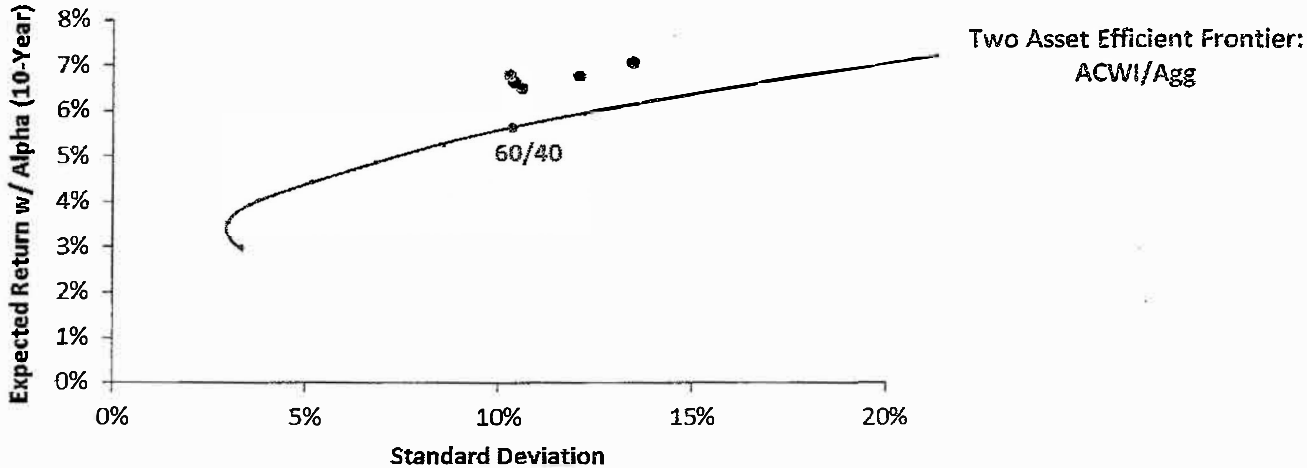
Add 10% PE from Public Equity

Get to 7.0% W/ PE

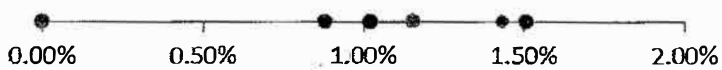
Get to 7.0% W/O PE

60 ACWI/40 Agg

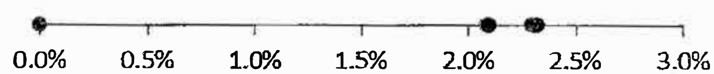
Risk and Return



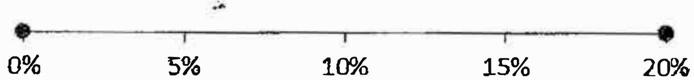
Excess Return



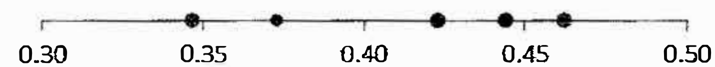
Tracking Error



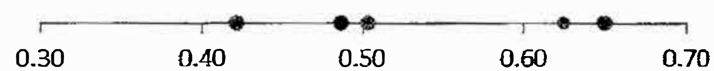
Percentage of Semi-Liquid Assets



Sharpe Ratio[1]

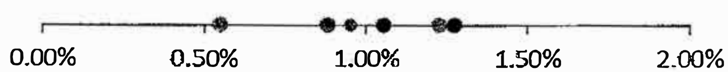


Information Ratio



Percentage of Illiquid Assets

Fees



1 Risk free rate assumption (cash) is 2%.