



MPERS PENSION REFORM ANALYSIS

Testimony for:

Michigan Senate Appropriations Committee

Prepared by:

Reason Foundation

Pension Integrity Project

November 30, 2016



Overview

1. Why MPSERS pension reform is needed as soon as possible for plan members and taxpayers
2. What benchmarks indicate whether proposed pension reform is meaningful and good public policy
3. How the proposed MPSERS reform stands up to those benchmarks for good public pension policy

1. WHY MPSERS PENSION REFORM IS NEEDED NOW

- The Pension Plus plan created in 2010 is exposed to the same risks and problems that have plagued the Non-Hybrid MPSERS plans.

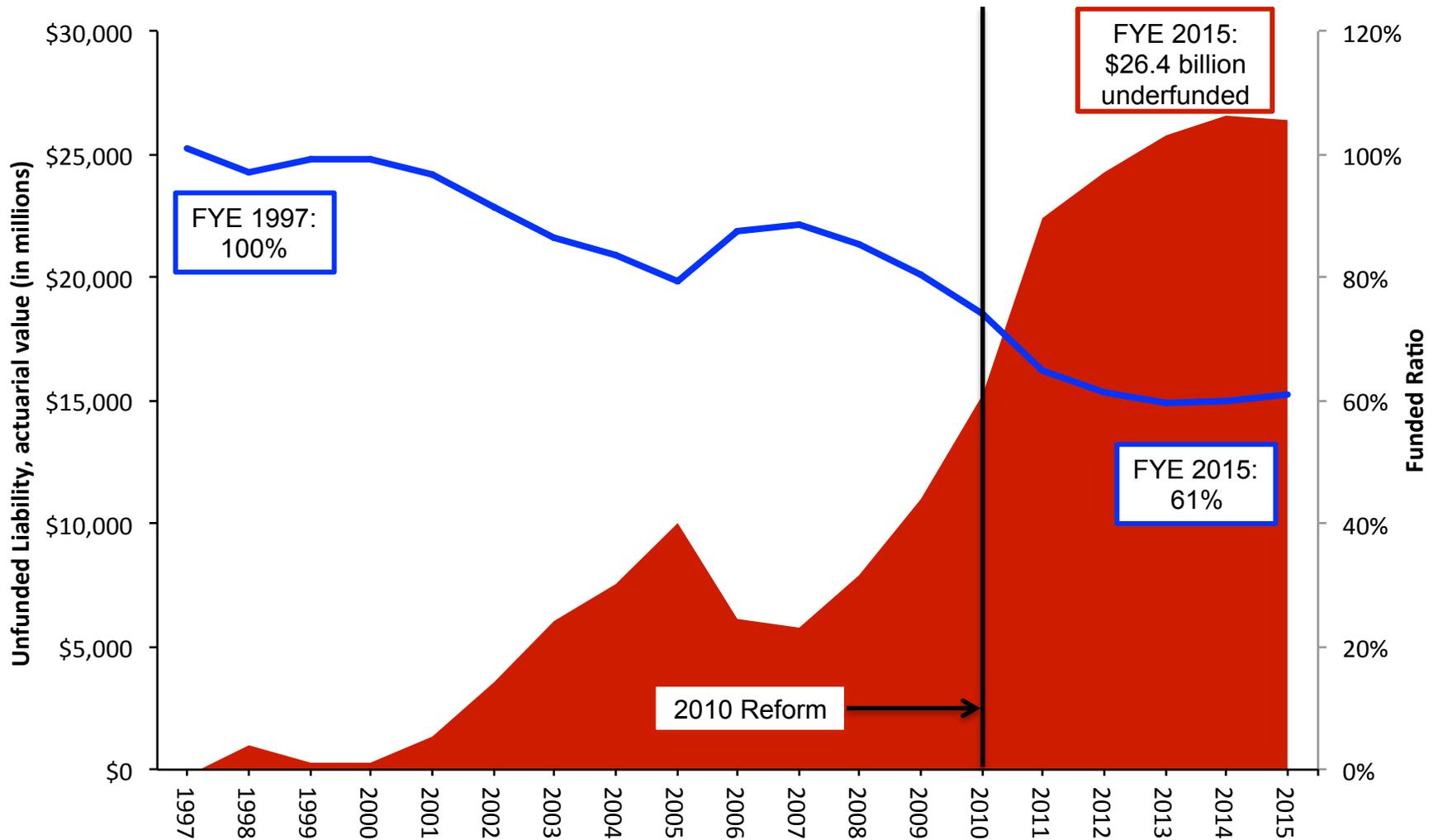


MPERS Problem: Degrading Solvency

- MPERS defined benefit plans have experienced volatile changes in their funded level over the past two decades.
 - 1997 to 2015: Unfunded Liabilities have increased \$26 billion
 - 1997 to 2015: Funded Ratio decreased from 100% to 61%
- Underperforming investment returns have been a key driver of this problem of degrading solvency.
 - Other aggressive actuarial assumptions and problematic funding policy have contributed
- The Pension Plus plan (i.e. “hybrid”) is exposed to the same patterns and practices threatening the Non-Hybrid plan.

MPSERS Problem: Degrading Solvency

A History of Volatile Funding Progress

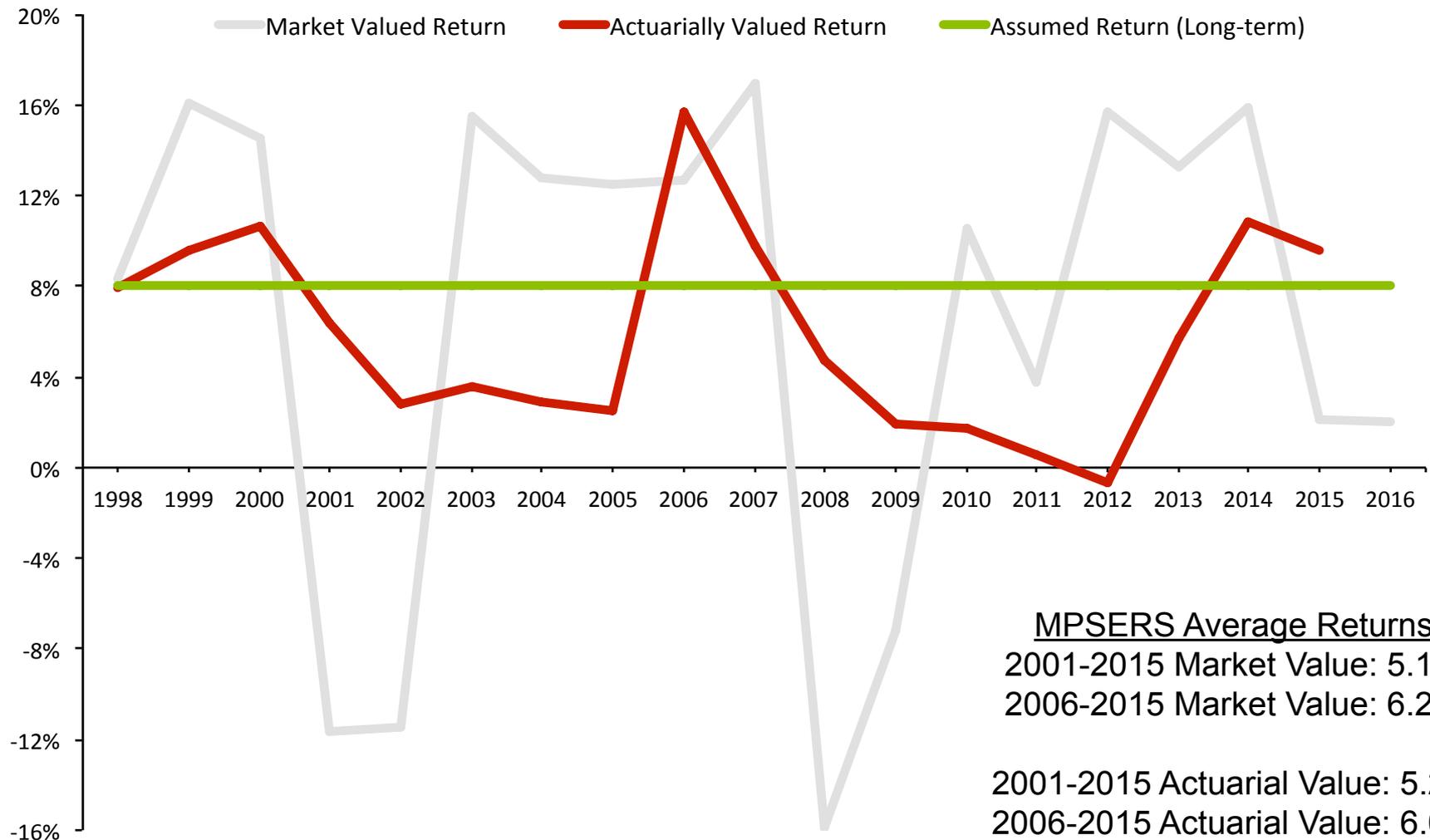


Source: Reason Foundation analysis of MPSERS actuarial valuation reports. Figures on an actuarial value basis.



MPSERS Problem: Underperforming Assets

Investment Return History, 1998 - 2016



Source: Reason Foundation analysis of MPSERS actuarial valuations. The 6/1/16 annualized return was 1.5%, figure assumes 9/30/16 return was 2%.



New Normal: Forecasts for Future Returns are Significantly Lower than Past Returns

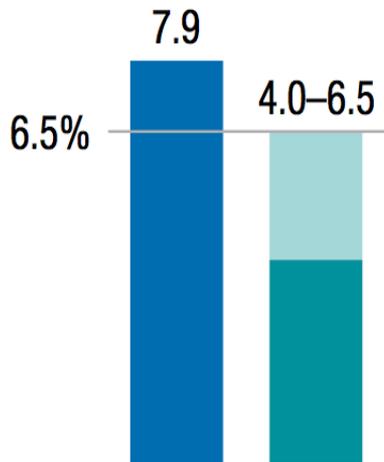
The past 30 years saw returns that exceeded the long-run average

■ Historical real returns
 — Last 100 years average return

The next 20 years could be more challenging

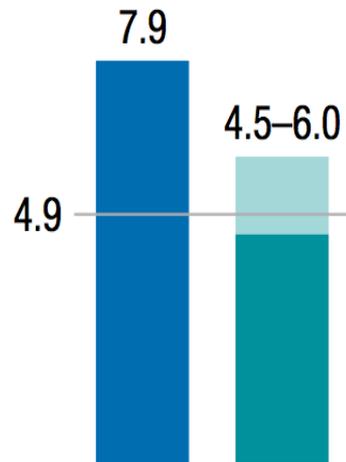
■ Growth-recovery scenario
 ■ Slow-growth scenario

US equities



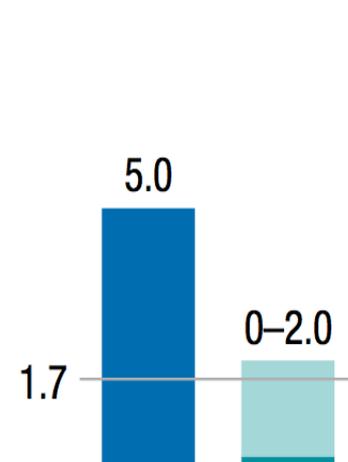
Last 30 Next 20

European equities



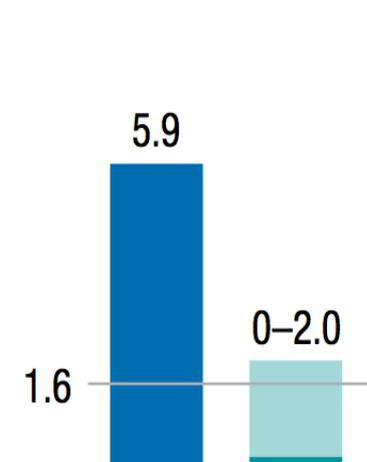
Last 30 Next 20

US bonds



Last 30 Next 20

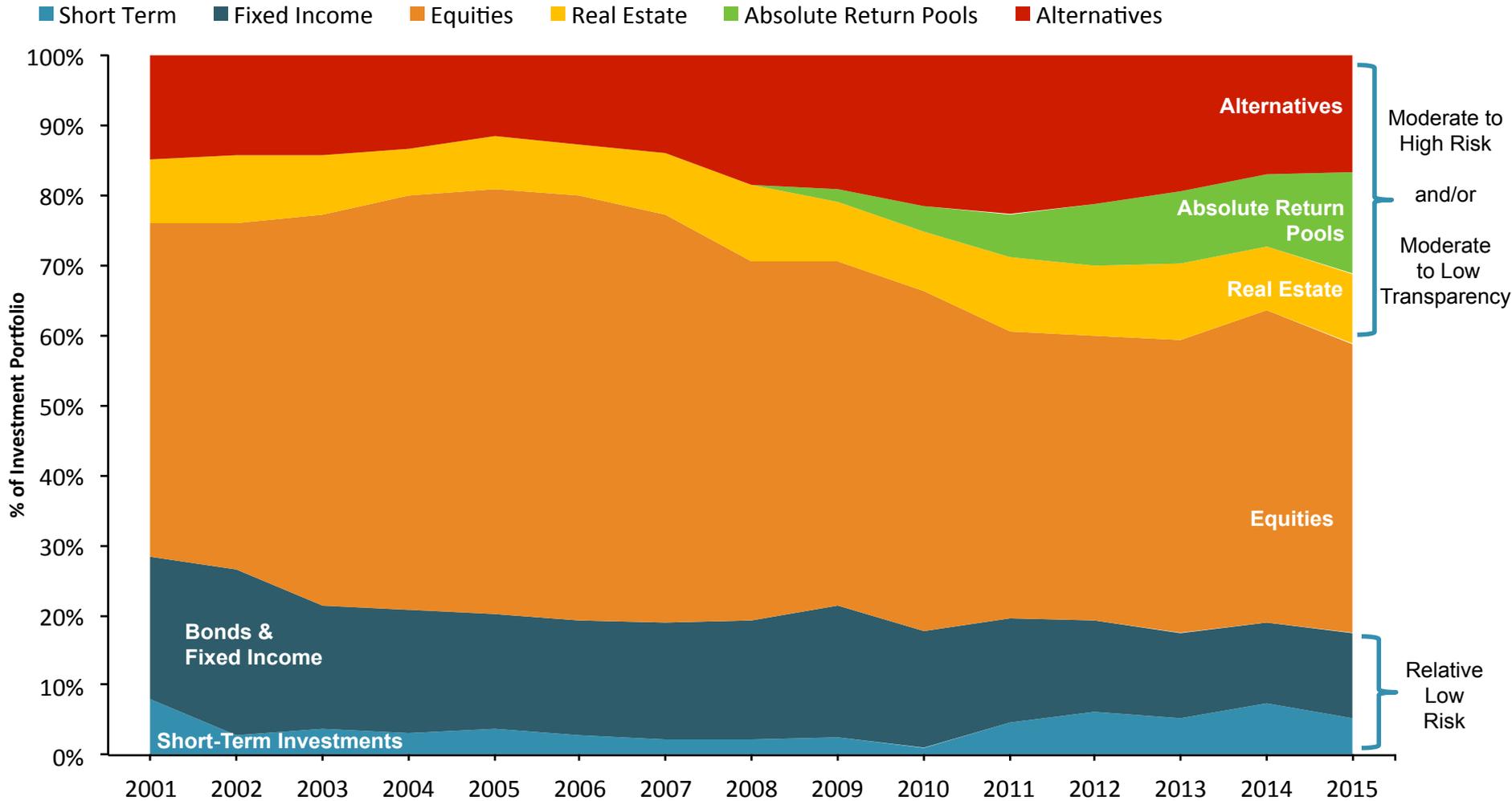
European bonds



Last 30 Next 20

MPSERS Asset Allocation (2001-2015)

Increasing Investment Risk Over Time

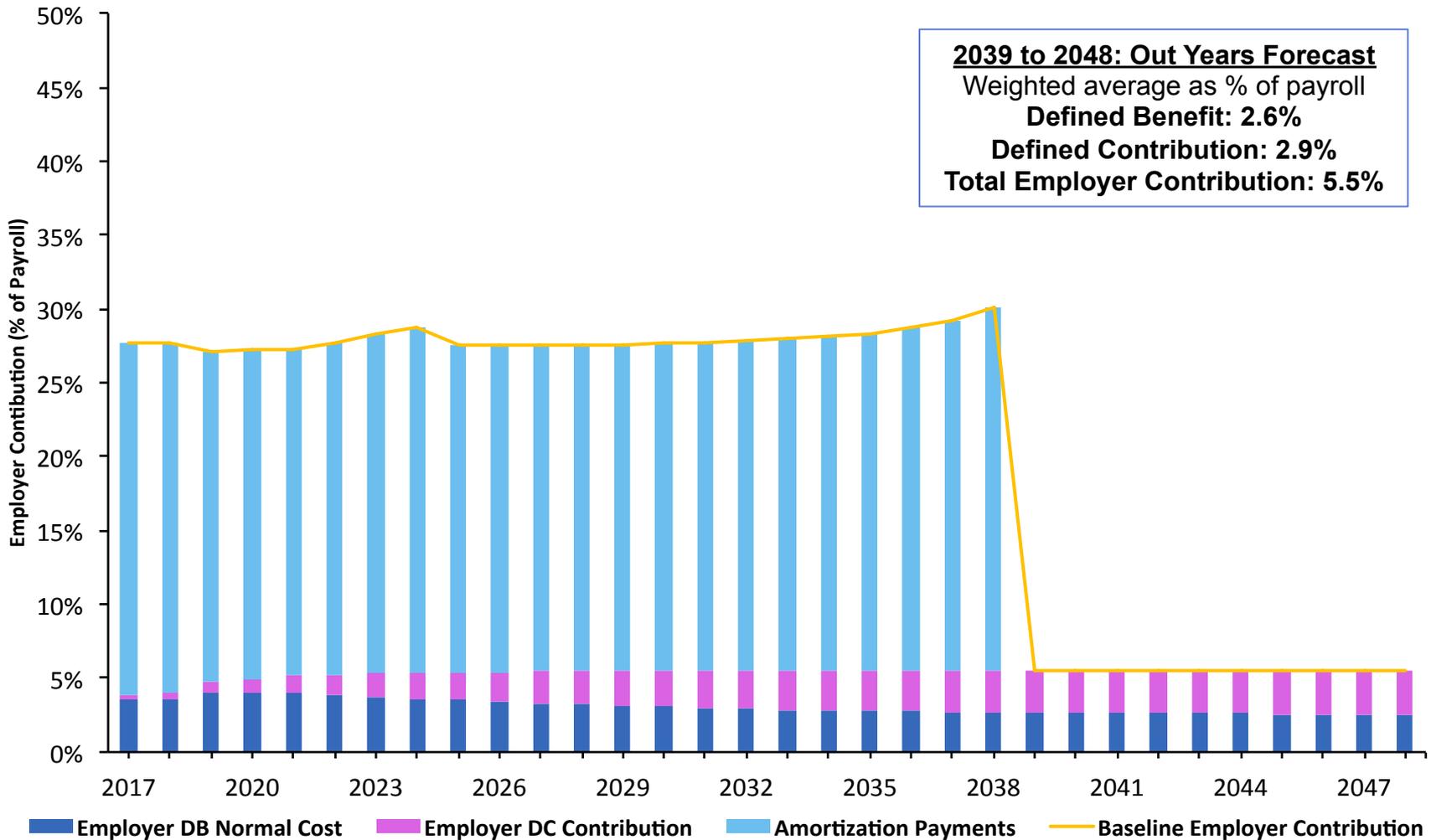


Source: Reason Foundation analysis of MPSERS actuarial valuation reports, State of Michigan CAFRs.

MPERS Employer Contribution Forecast (as % of Payroll)

Baseline: Normal Cost + Amortization Payment

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 8% / 7%



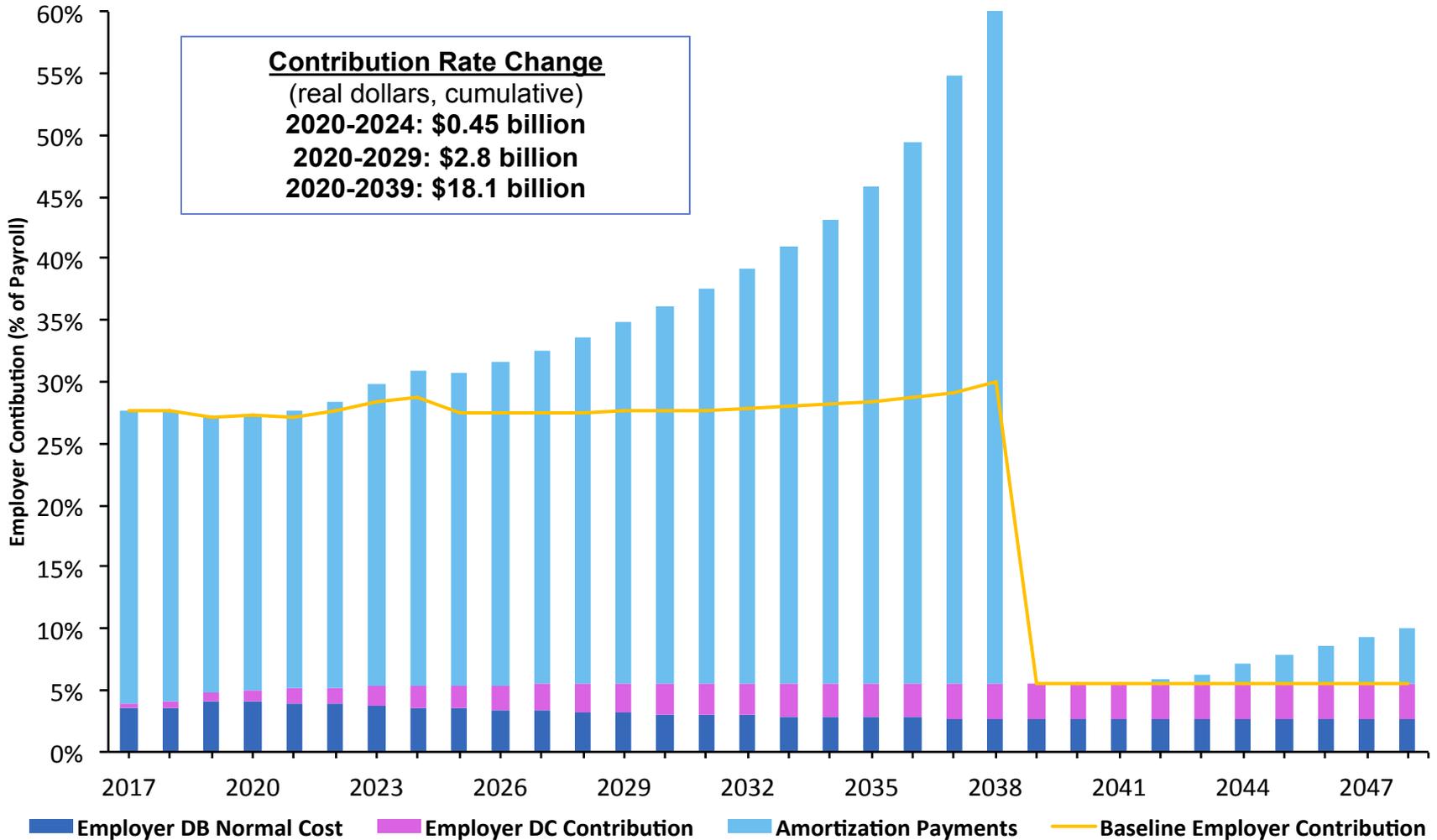
Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.



MPSERS Employer Contribution Forecast (as % of Payroll)

Underperforming Assets: 6% Actual Return

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 6%



Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.

2. WHAT GOOD PENSION REFORM LOOKS LIKE



Objectives of Good Reform

- Provide retirement security for all employees, current and future
- Stabilize contribution rates for the long-term
- Reduce taxpayer and pension system exposure to financial risk and market volatility
- Reduce long-term costs for employers/taxpayers and employees
- Ensure ability to recruit 21st Century employees
- Improve governance
 - Expert driven governance
 - Improve efficiency and create consistency for employers

3. ANALYSIS OF PROPOSED MPSERS CHANGES

Objective 1: Provide Retirement Security For All Employees, Current & Future



1. Primary functions of defined contribution plans are to:
 - Establish stable, predictable costs for employers and employees.
 - Eliminate all financial risk to state/taxpayers over time; no possibility of new unfunded liabilities for DC plan participants.
 - Provide a portable benefit that is attractive to 21st Century employees (e.g. Millennials) and more equitable to all employees in the public school system.
2. Proposed reform will make it easier to pay off unfunded liabilities in the long-run and ensure 100% funding for promised benefits.
 - Closing the Pension Plus plan and offering future MPSERS members a defined contribution retirement benefit would put a cap on the growth of liabilities exposed to current problems.
 - That cap means less overall unfunded liability growth, and increased ability for taxpayer resources to pay down pension debt and ensure plan solvency.
3. Proposed reform will provide a competitive retirement benefit for future employees that is flexible and portable.

Objective 2: Stabilize Contribution Rates For The Long-Term

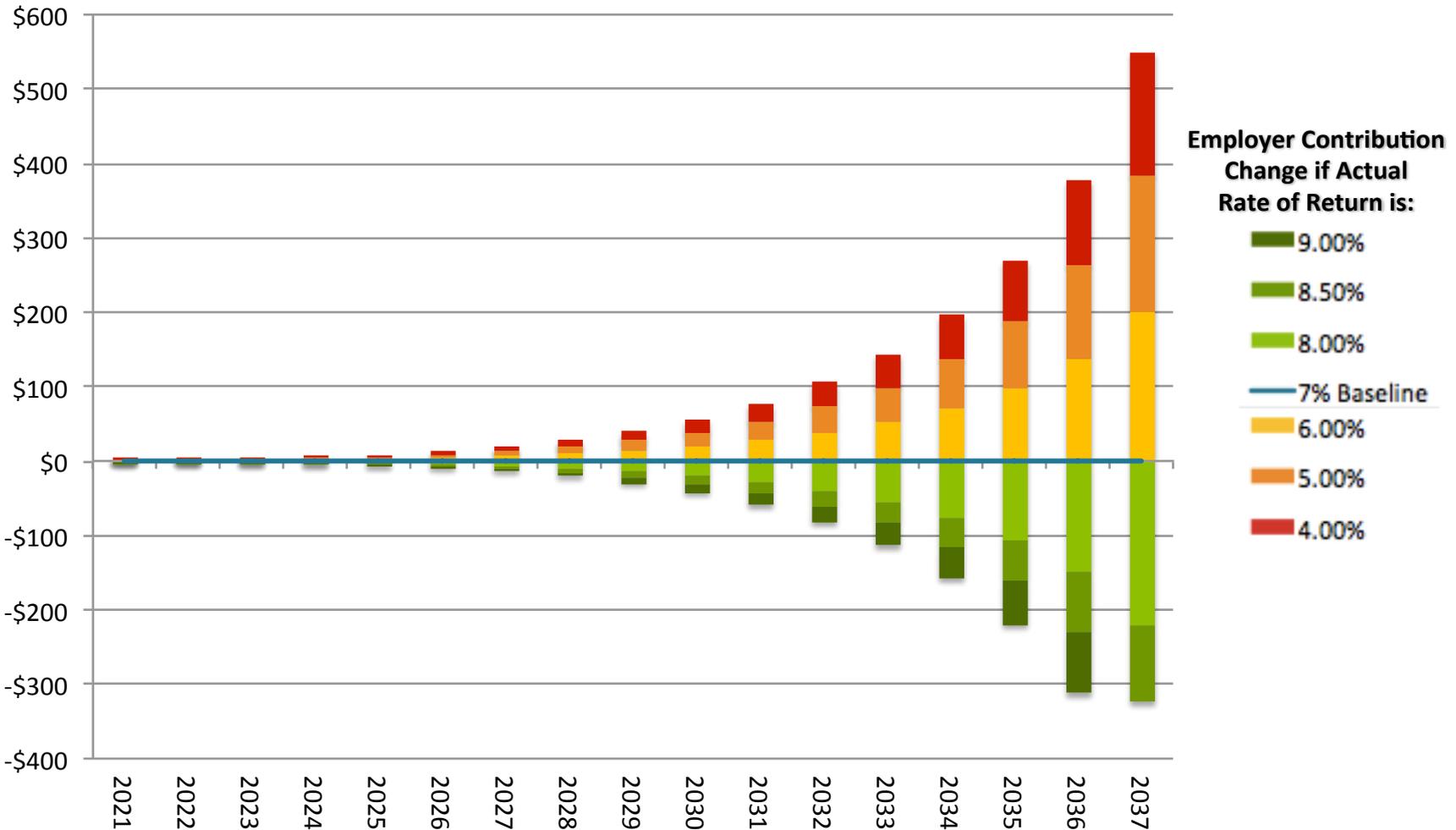


1. There is a high probability of volatility in employer contributions for new hires due to unfunded liabilities in the Pension Plus plan.
 - The Pension Plus plan has been fortunate that there have been two strong years of investment returns since its inception.
 - However, going forward the Pension Plus plan is exposed to risks associated with aggressive actuarial assumptions, including a 7% assumed rate of return.
 - Plus, employer contributions towards new hire benefits under the status quo will vary depending on how many future employees choose the Pension Plus plan or the optional defined contribution only plan.
2. The proposed defined contribution only plan would have no volatility for new hire benefits, creating fixed costs in the long-term.

MPERS Change in Employer Contribution Forecast (in \$ millions)

New Hire Volatility: Pension Plus Plan

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return Varies



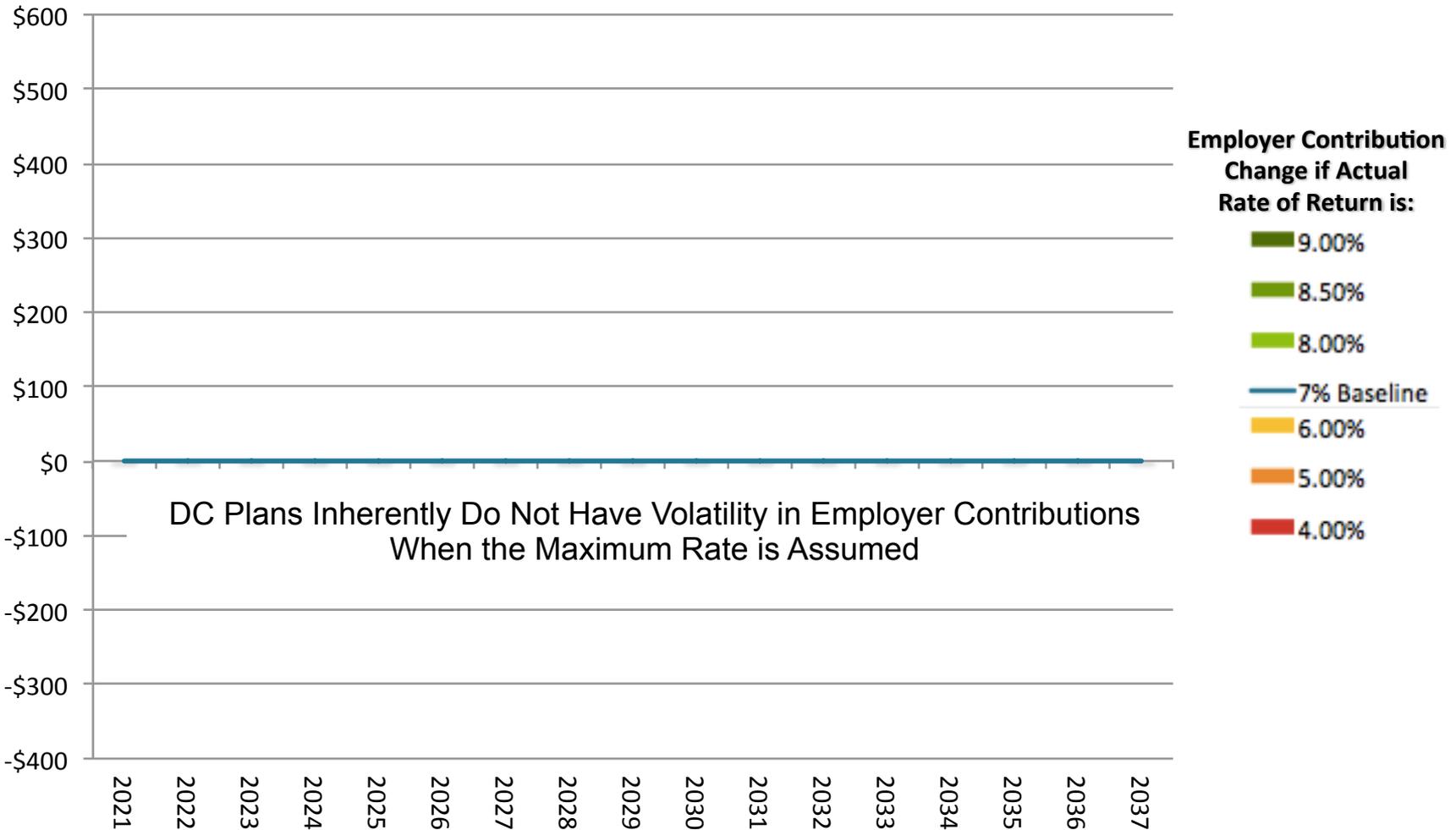
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MPERS Change in Employer Contribution Forecast (in \$ millions)

New Hire Volatility: DC Plan



DB Plan: Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return Varies

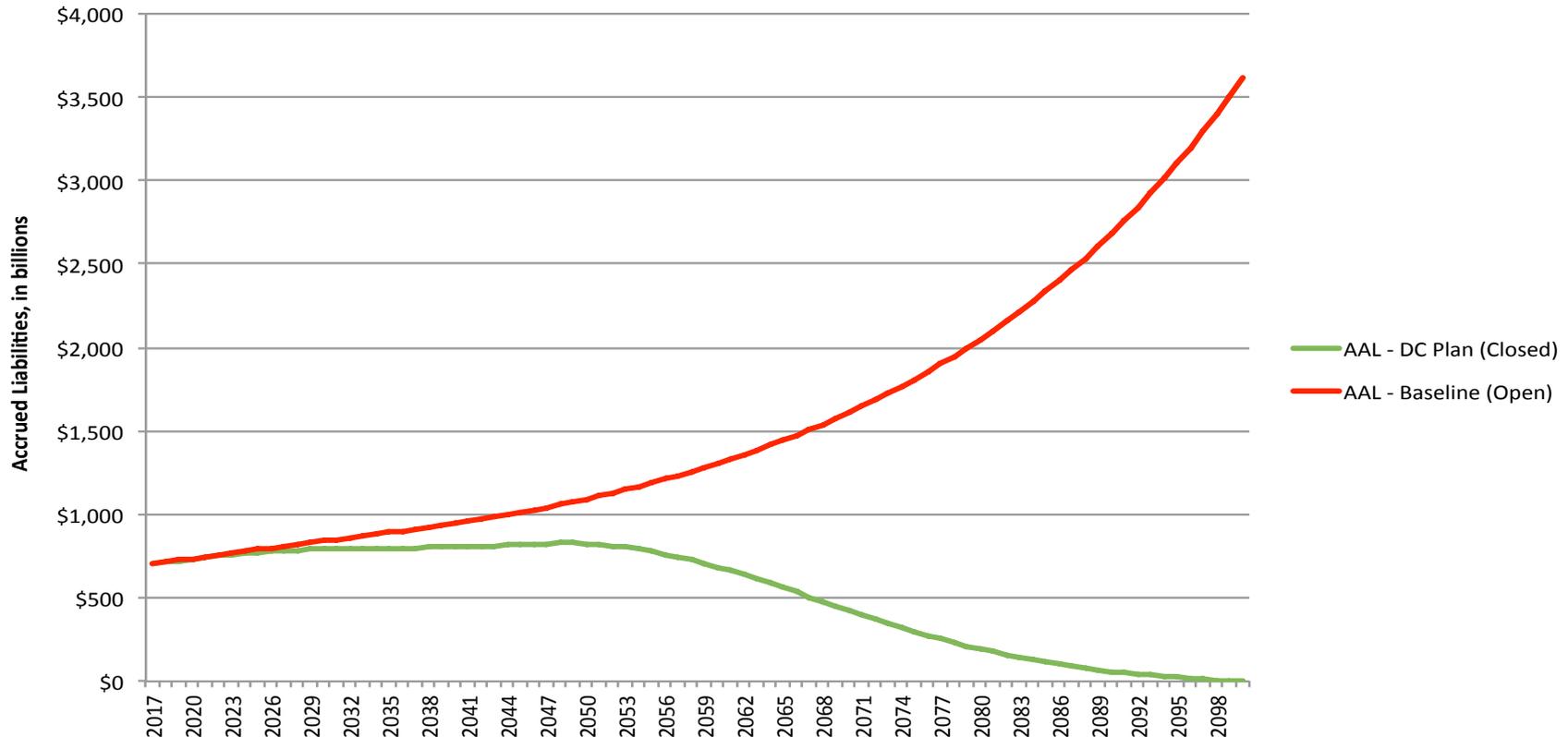


Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.

Objective 3: Reduce Exposure To Financial Risk & Market Volatility



MPERS Accrued Liability Forecast Change in Growth of Promised Pensions (in Billions)



Note: Forecast of accrued liabilities over an 80 year time frame is only intended to be representative of the comparative trajectories of promised pension benefits in an open versus closed plan. Years shown are contribution fiscal year end dates.

Objective 4. Reduce Long-Term Costs For Employers/Taxpayers & Employees



1. The proposed changes would mean a slightly higher employer contribution to retirement benefits compared to the current forecast.
 1. However, this only will hold true if all plan assumptions are turned out to match future reality.
 2. Compared to scenarios where investment returns underperform, or where actuarial assumptions are changed to adopt a more conservative funding policy, the proposed changes would mean either neutral or slightly reduced costs.

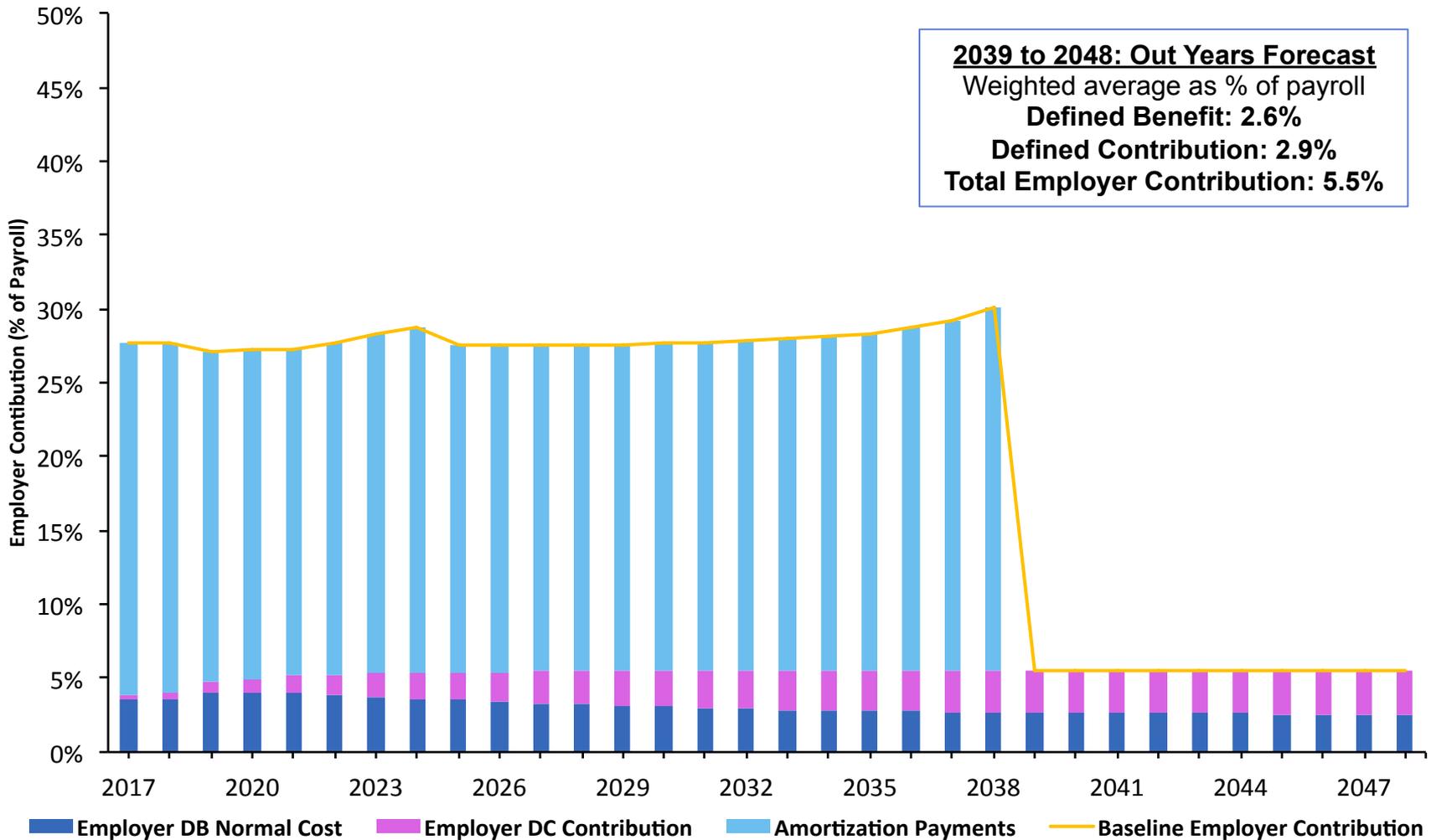
2. The proposed changes would allow for flexible employee contributions, lowering rates below the current member weighted average rate of 4.83%.

MPERS Employer Contribution Forecast (as % of Payroll)

Baseline: Normal Cost + Amortization Payment



Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 8% / 7%

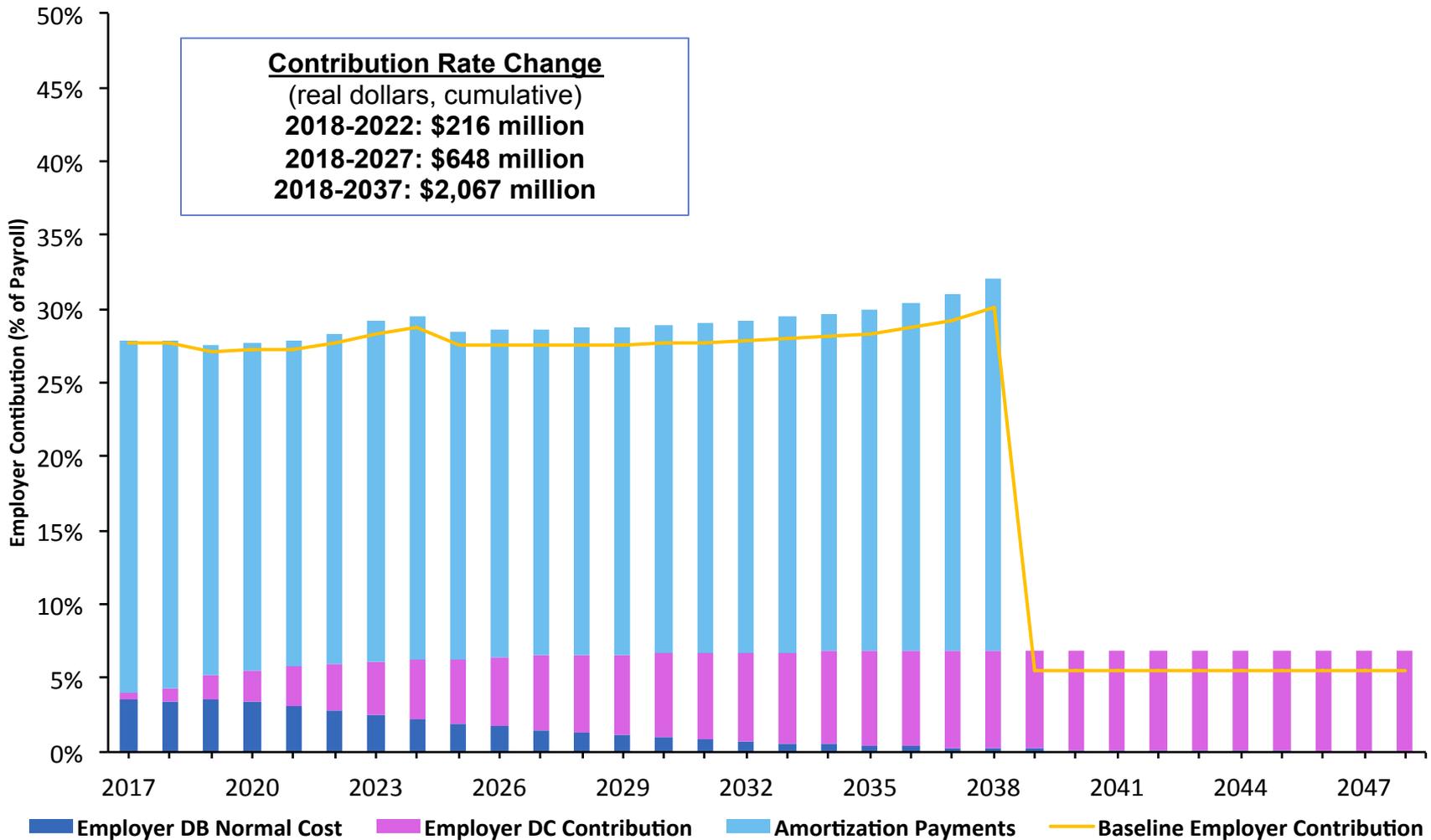


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MPERS Employer Contribution Forecast (as % of Payroll)

DC Plan: 7% Employer Contribution

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 8%, Amortization: Level-%



Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.

Objective 5: Ensure Ability To Recruit 21st Century Employees



1. As of the end of 2015, roughly 40% of teachers hired are expected to leave within five years of joining the MPSERS system. About 60% of non-teachers are expected to leave within five years.
2. The Pension Plus plan requires at least 10 years of service in order to qualify for a normal retirement. Members who leave before then are entitled to a refund of their own contributions.
3. This means for the 40% of teachers (and 60% of non-teachers) who select the Pension Plus plan when they are hired into MPSERS and then leave within five years there is effectively no retirement benefit.
4. Alternative benefit designs may be necessary to ensure long-term recruitment and retention success.

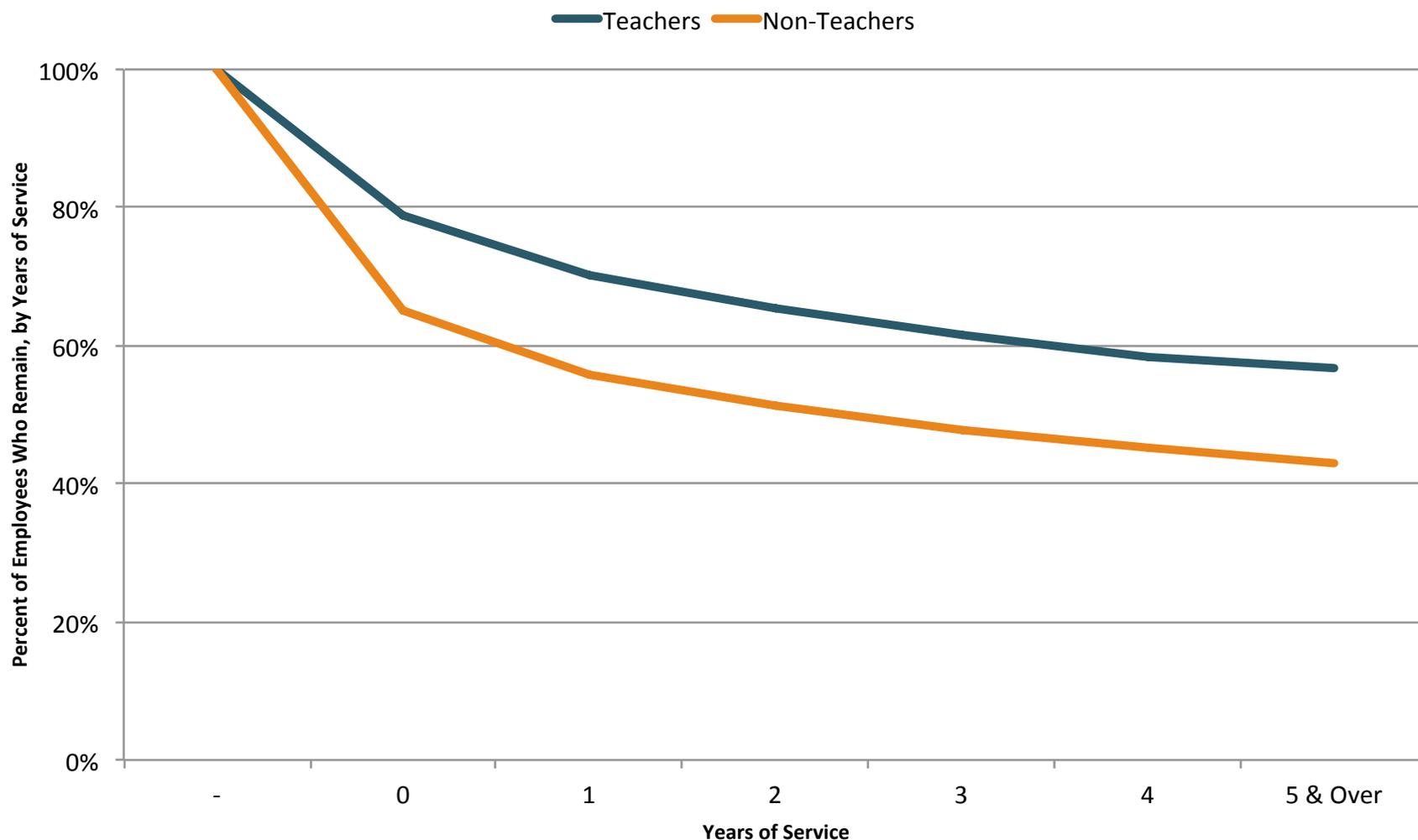
Objective 5: Ensure Ability To Recruit 21st Century Employees (cont'd)



5. Defined benefit plans like the Pension Plus plan can be attractive for employees looking to work a lifetime career in one place.
 - However, they do not provide a good retirement benefit for a more mobile workforce.

6. Defined contribution plans can be attractive options for younger workers who may not want to work a full career in one place or who want to teach for a few years as a public service, or for older teachers who have moved to Michigan but don't want to work the full number of years necessary to earn a complete retirement benefit.
 - However, they do not necessarily bind an employee to a single system the way that defined benefit plans do.
 - The Pension Plus plan does offer a DC plan with a 1% employer contribution, but this benefit is nominal.

Likelihood of Members Remaining MPERS Employees, Cumulative





Objective 6: Improve Governance

- No substantive changes to governance have been proposed.
 - The Pension Integrity Project did not comprehensively analyze current governance practices.
 - Future legislative or executive branch pension reform efforts may consider whether the fiduciary standards applied to plan governance are in line with current best practices, and whether the transparency on all plan investments meet with standards for best practices in the public sector.

TRANSITION COST ISSUES

Does MPSERS Need to Adopt a Lower Assumed Rate of Return Today?



- *Transition Cost Argument #1*: A closed MPSERS could risk having lower cash flow than necessary to pay benefits after 2039, therefore MPSERS should change its asset allocation and gradually reduce the assumed rate of return to 5% by 2039.
- Counter View:
 1. There is no legal requirement that MPSERS take this approach.
 2. A gradual reduction in the assumed rate of return would be prudent whether or not the MPSERS closes the Pension Plus plan because of the investment risks that exist for the current Non-Hybrid and Pension Plus plans.
 3. Almost all of proposed reductions in the assumed return should be seen as relative to the current, overly aggressive assumed rate of return. Thus, to the degree that there is a need to change the assumed rate of return it is not primarily because of the proposal to close the Pension Plus plan and replace it with a DC plan.
 4. If a change to the assumed return is not possible in the context of the existing budget no matter whether MPSERS is open or closed, this should not be a reason to disregard the proposed DC plan. The investment policy will be revisited soon with MPSERS upcoming experience study.

Does MPERS Need to Change the Unfunded Liability Amortization Method?



- *Transition Cost Argument #2*: A closed MPERS should change the method of paying off unfunded liabilities from being a consistent percentage of payroll (“level-percent”) to a consistent annual dollar amount (“level-dollar”) because the payroll size will be changing.
- Counter View:
 1. There is no legal requirement that MPERS take this approach.
 2. Changing amortization methods would effectively “accelerate” the payoff of unfunded liabilities, which would reduce the total amount taxpayers ultimately have to pay in amortization payments.
 3. However, if it is not feasible in the context of the existing budget to make a change, the existing amortization method can be maintained by making amortization payments a percentage of the total payroll of MPERS employers — an approach used in other similar jurisdictions.

CONCLUSION



How Well Proposal Meets Objectives

| Element | Baseline | Proposed Reform |
|--|---|--|
| Provide Retirement Security for Members & Retirees | UNCERTAIN <i>Aggressive actuarial assumptions expose plan to insolvency; roughly 50% turnover rate within 5 years</i> | YES <i>Cap on accrued liabilities from the DC plan will allow the state greater latitude in paying off unfunded liabilities; DC plan benefits are very competitive with private sector standards</i> |
| Stabilize Contribution Rates for the Long-term | NO | YES |
| Reduce Taxpayer Exposure to Financial and Market Risk | NO | YES <i>23% Reduction in Accrued Liabilities by 2049, pension obligations eventually fall to 0%</i> |
| Reduce Long-term Costs for Employer/Taxpayers and Employees | NO | LIKELY <i>DC plan costs are fixed and likely lower than the long-term taxpayer contributions to new hire benefits in the Pension Plus plan once future amortization payments are factored in</i> |
| Ensure Ability to Recruit 21 st Century Employees | SOME <i>Thus far, Michigan continues to recruit, but desire for mobility in the labor force is increasing</i> | YES <i>The strong total benefit of the proposed DC is attractive, and the mobility of a DC plan aligns better with a 21st century workforce</i> |
| Improve Governance & Transparency | n/a | <i>There is still a need to improve the funding policy of the existing defined benefit plans</i> |



Concluding Comments

1. The combined effect of changes in 2010 and 2012 have been positive steps for the state in terms of constraining the growth in taxpayer liability. However, significant risks in the system remain.
2. The range of aggressive actuarial assumptions of the current plan suggest continued degrading solvency is likely.
3. While the state continues to maintain its targeted unfunded liability payoff date of 2038, the growth in required contributions as that date approaches will be substantial if there are no changes to the current plan. It is likely that the budgetary pressures will lead a future legislature to modify the amortization policy.
4. Closing the Pension Plus plan to new hires, and offering all future workers a DC Plan would cap the growth of pension obligations, meaning fewer liabilities exposed to the risk inherent in defined benefit plan funding policies and assumptions.
5. Ideally, the state would also lower the assumed rate of return for the existing DB plan in order to reduce taxpayer risk. But if that cannot be fiscally accomplished at this time a good next step for MPSERS reform would be to close the Pension Plus plan now.



Questions?

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APPENDIX

- Detailed analysis of the problems facing MPSERS

MPSERS PROBLEM: ASSUMED RATE OF RETURN

- The MPSERS assumed return for both the Non-Hybrid and Pension Plus tiers is exposing taxpayers to significant investment return risk
- The normal cost for both the Non-Hybrid and Pension Plus tiers is likely underpricing the long-term cost for benefits



MPERS Underperforming Assets

- MPERS asset allocation targets an 8% long-term average rate of return, and has done so for more than two decades. While the non-hybrid plan assumes a 7% return, assets are co-mingled in an portfolio that is targeting an 8% return.
- However, the 15-year and 10-year average MPERS returns are underperforming this investment target.

Historic MPERS Average Returns:

- 15-Year Market Value — **2001 to 2015: 5.1%**
- 15-Year Actuarial Value — 2001 to 2015: 5.2%

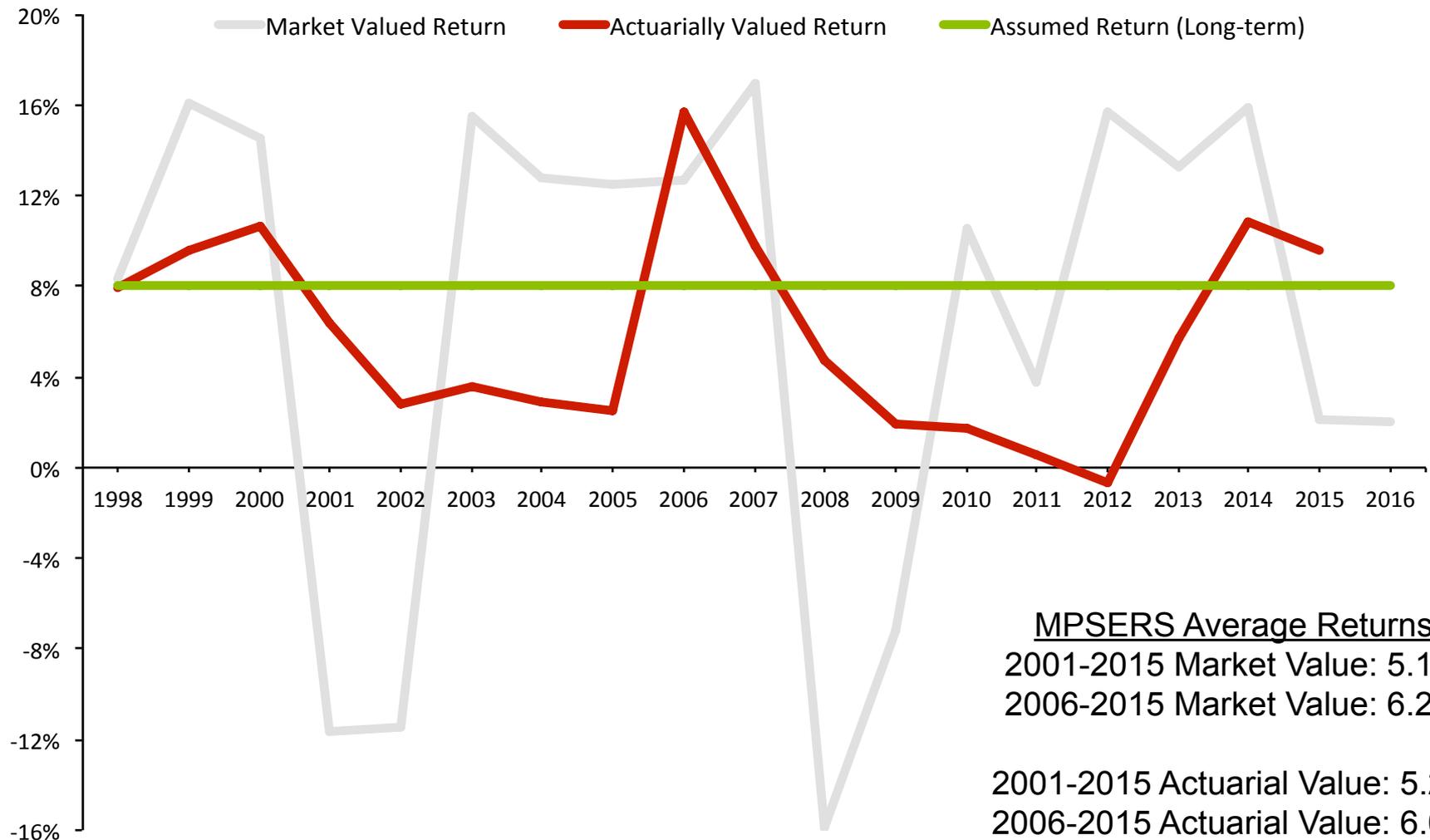
- 10-Year Market Value — **2006 to 2015: 6.2%**
- 10-Year Actuarial Value — 2006 to 2015: 6.0%

Note: Historic performance is not always the best measure of future performance. The new normal for institutional investment returns and most major forecasts of market conditions suggest it is unlikely the state's pension plans will make up these missed returns soon.
Source: Reason Foundation analysis of MPERS actuarial valuations. Market value returns are geometric average.



MPSERS Problems: Underperforming Assets

Investment Return History, 1998 - 2016



Source: Reason Foundation analysis of MPSERS actuarial valuations. The 6/1/16 annualized return was 1.5%, figure assumes 9/30/16 return was 2%.



New Normal: The Recovery Has Already Happened, the Market Has Changed

- The “new normal” for institutional investing suggests that achieving even a 7% average rate of return is optimistic.
1. Over the past two decades there has been a steady change in the nature of institutional investment returns.
 - 30-year Treasury yields have fallen from around 8% in the 1990s to consistently less than 3% today.
 - Globally, interest rates are at ultralow historic levels.
 - There is an increased demand for fixed income products in part because of the retiring baby boomer generation, which has driven now average yields for bonds to between 0% and 2%.
 - Stock markets continue to grow, but at a slower pace than historically.
 2. MPSERS is very unlikely to recover with time.
 - Major stock indices have recovered from the financial crisis, but unfunded liabilities remain.



New Normal: The Recovery Has Already Happened, the Market Has Changed (cont'd)

3. McKinsey & Co. forecast the returns to equities will be 20% to 50% lower over the next two decades compared to the previous three decades.
 - Using their forecast model, a 60/40 portfolio of equities and bonds is likely to earn less than a 5% return, even assuming continued growth in the economy.
 - This suggests that investments in non-transparent, illiquid, potentially riskier alternative assets will be necessary in order to reach even a 7% return, much less 8% return.

4. A 2014 report from RVK Inc. found: that MPSERS assets “must earn annual returns in excess of 11.7% over the next 10 years or 9.1% over the next 20 years every year without exception in order to reach full funding.”

It should be clear that MPSERS cannot simply wait for “recovery.”



New Normal: Forecasts for Future Returns are Significantly Lower than Past Returns

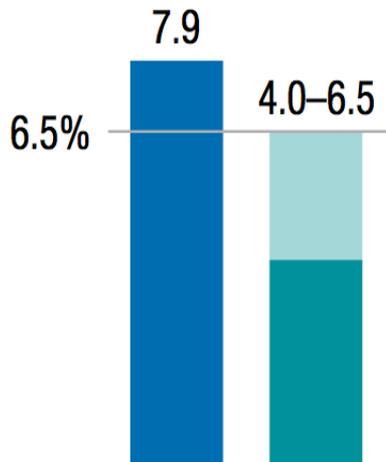
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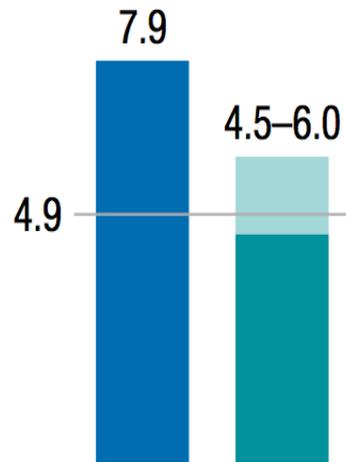
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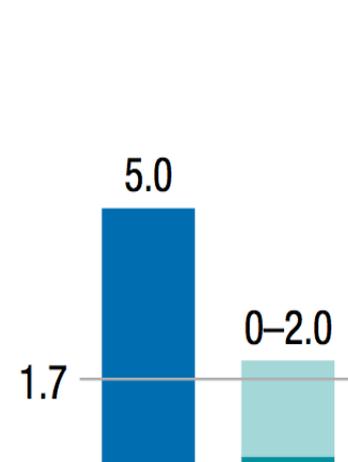
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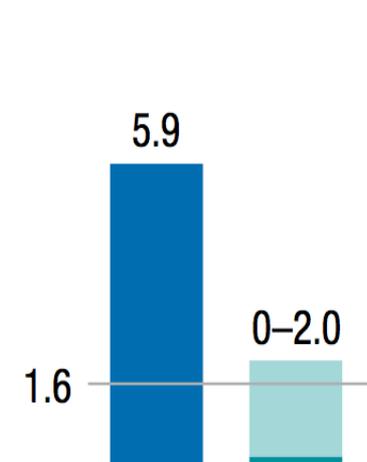
Last 30 Next 20

US bonds



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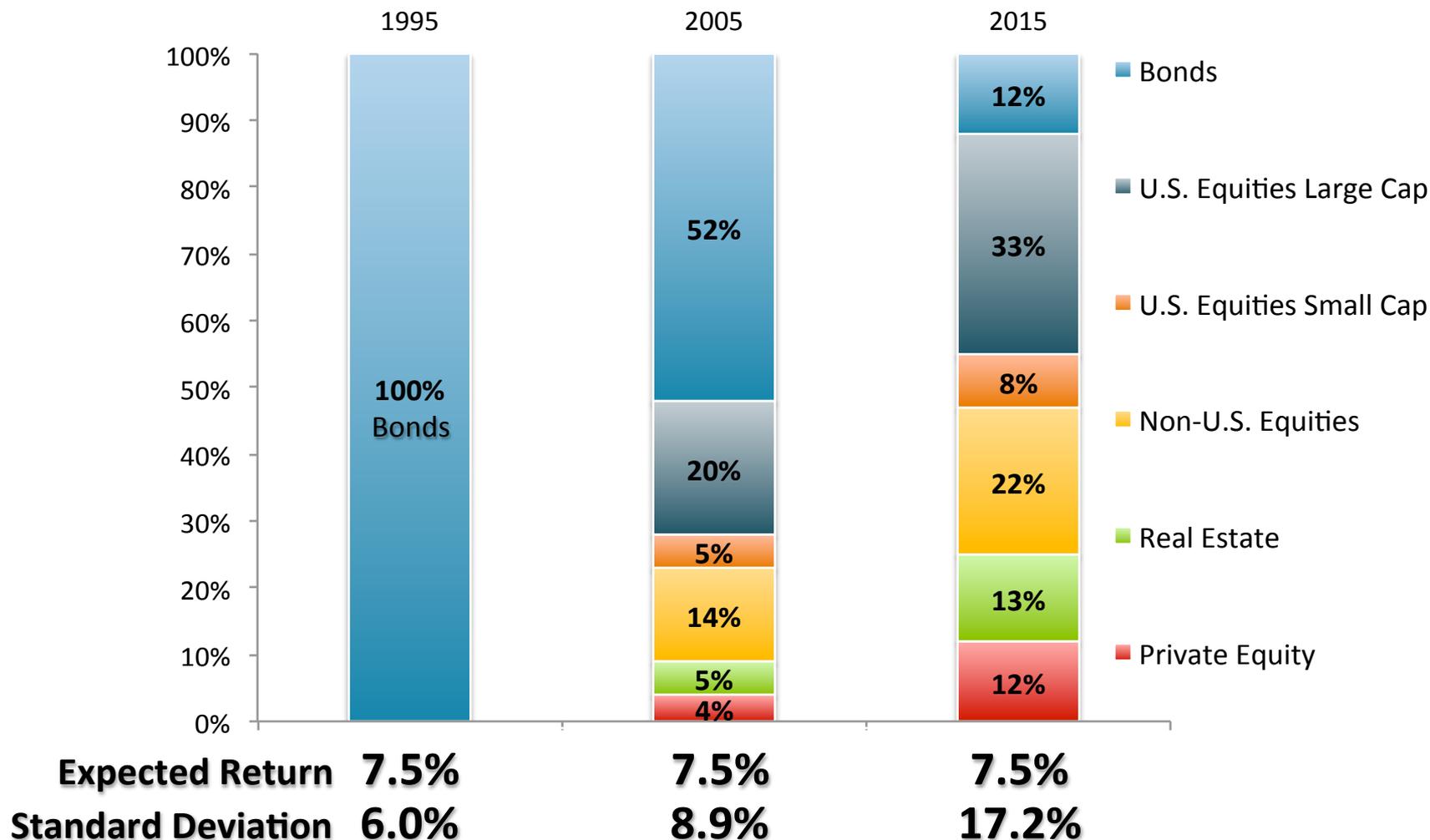
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Last 30 Next 20

New Normal: Market Trend Towards Risk

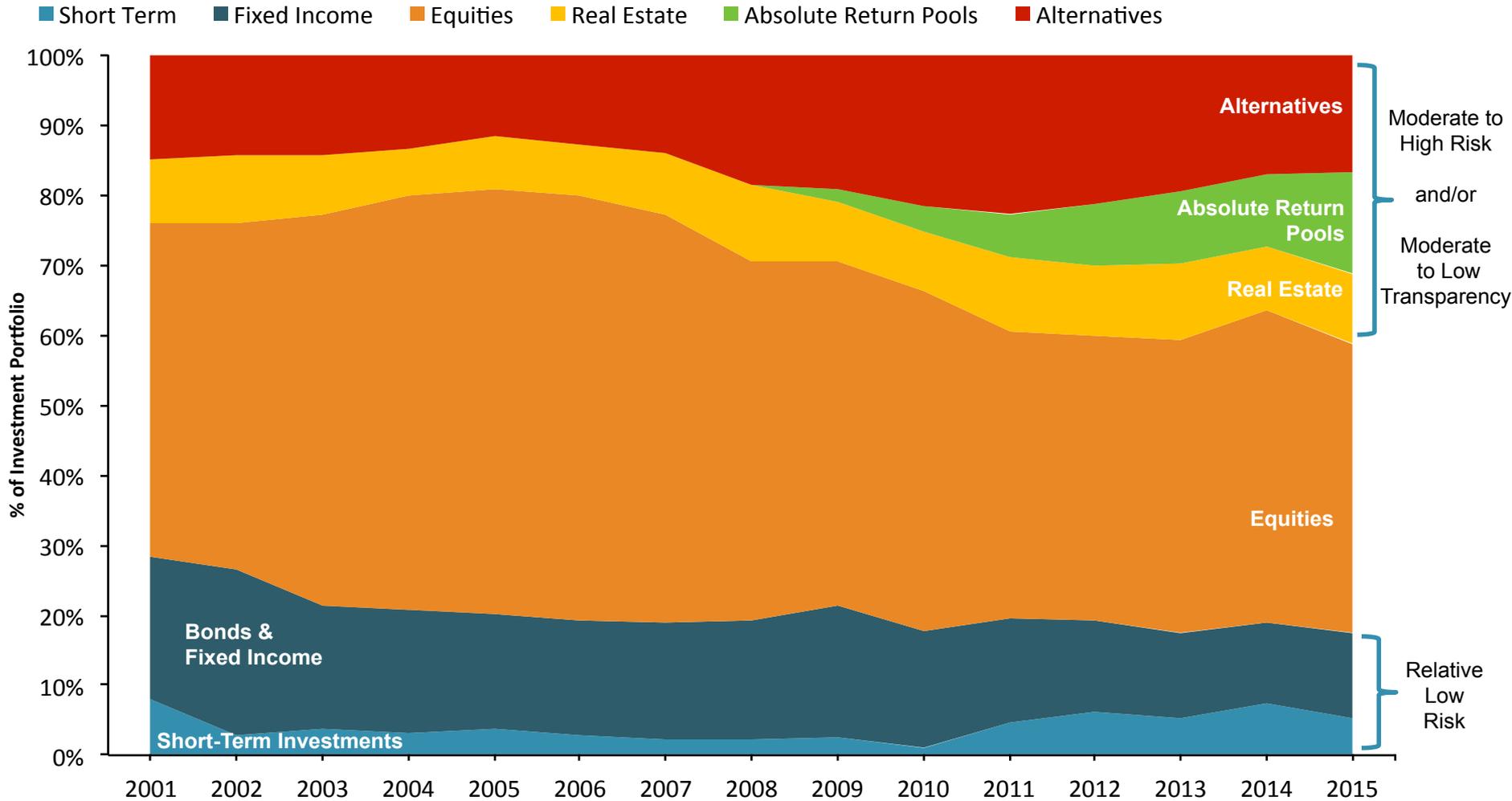
Average Portfolio Asset Allocation Necessary for a 7.5% Expected Return Has Required Shifting from 100% Bonds to a Riskier Mix of Asset Classes





MPSERS Asset Allocation (2001-2015)

Increasing Investment Risk Over Time



Source: Reason Foundation analysis of MPSERS actuarial valuation reports, State of Michigan CAFRs.



MPSEERS Baseline Contributions

(Amounts to be Paid in Contribution Fiscal Year 2018, % of payroll)

| | Non-Hybrid (2015 Val. Report) | Pension Plus (2015 Val. Report) | DC Only (2015 Val. Report) |
|--|---|---|--------------------------------------|
| Gross DB Plan Normal Cost (Weighted Average) | 8.4% | 7.9% | n/a |
| Unfunded Liability Amortization Payment | 22.18% | 22.18% | 22.18% |
| Total DB Plan Required Contribution | 30.6% | 30.2% | n/a |
| DC Plan Employer Contribution | n/a | Up to 1% | Up to 3% |
| Assumed Rate of Return / Discount Rate | 8% | 7% | n/a |
| Payroll Growth Assumption | 3% | 3% | 3% |
| Percent of New Hires | n/a | 75% | 25% |

Note: All figures are on an actuarial value basis and rounded. Normal costs shown are weighted averages for the tier. Total amortization payment includes 1.36% of payroll contribution for the early retirement incentive amortization payment.

MPSEERS Baseline Employer Share

(Amounts to be Paid in Contribution Fiscal Year 2018, % of payroll)



| | Non-Hybrid (2015 Val. Report) | Pension Plus (2015 Val. Report) | DC Only (2015 Val. Report) |
|---|---|---|--------------------------------------|
| Employer DB Plan Normal Cost (Weighted Average) | 3.75% | 3.07% | n/a |
| Employer DC Plan Contribution | n/a | Up to 1% | Up to 3% |
| Total Normal Cost Plus DC Match | 3.75% | 4.07% | 3% |
| Unfunded Liability Payment | 22.18% | 22.18% | 22.18% |
| Assumed Rate of Return / Discount Rate | 8% | 7% | n/a |
| Payroll Growth Assumption | 3% | 3% | 3% |
| Percent of New Hires | n/a | 75% | 25% |

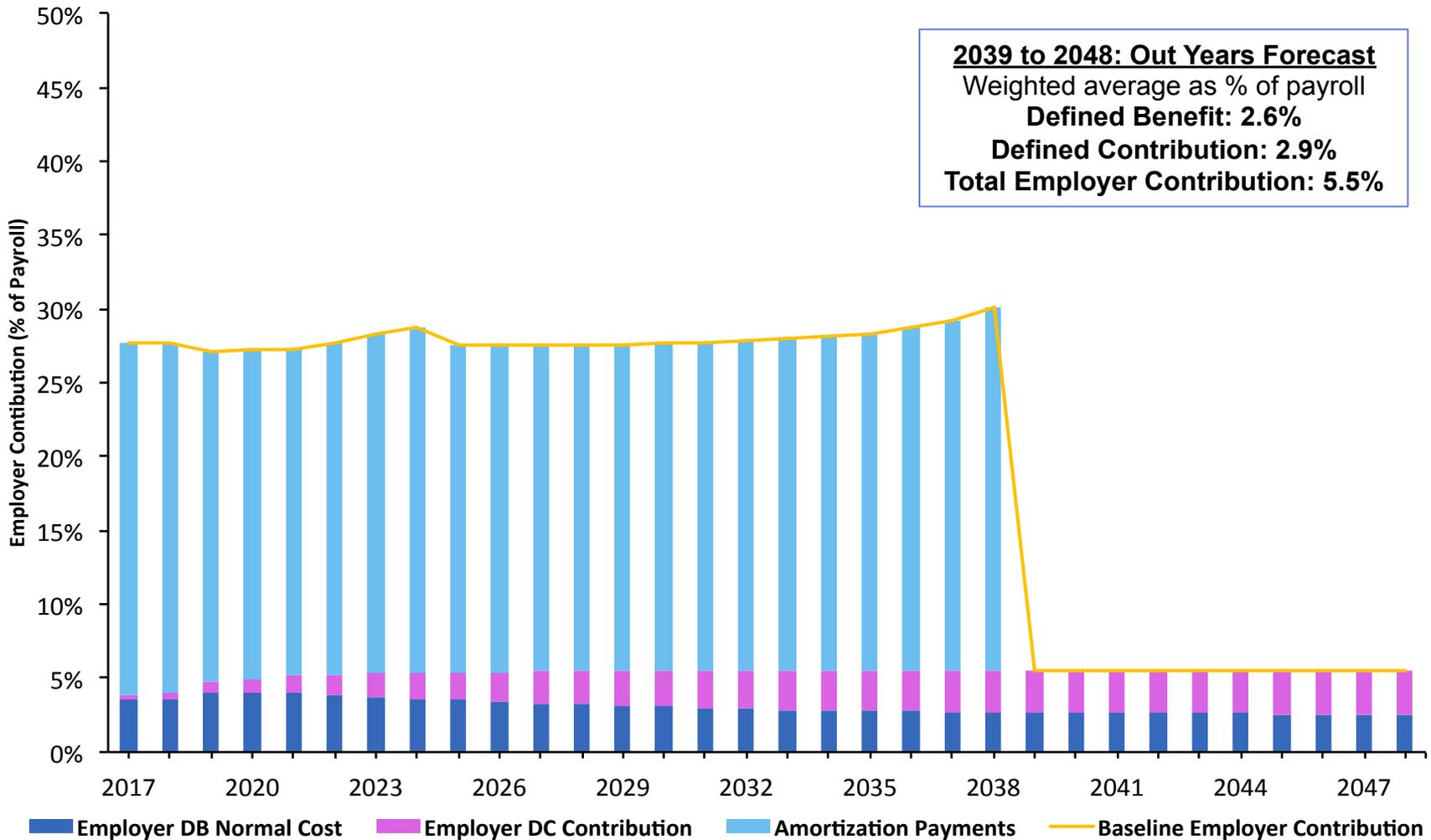
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MPERS Employer Contribution Forecast (as % of Payroll)

Baseline: Normal Cost + Amortization Payment



Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 8% / 7%



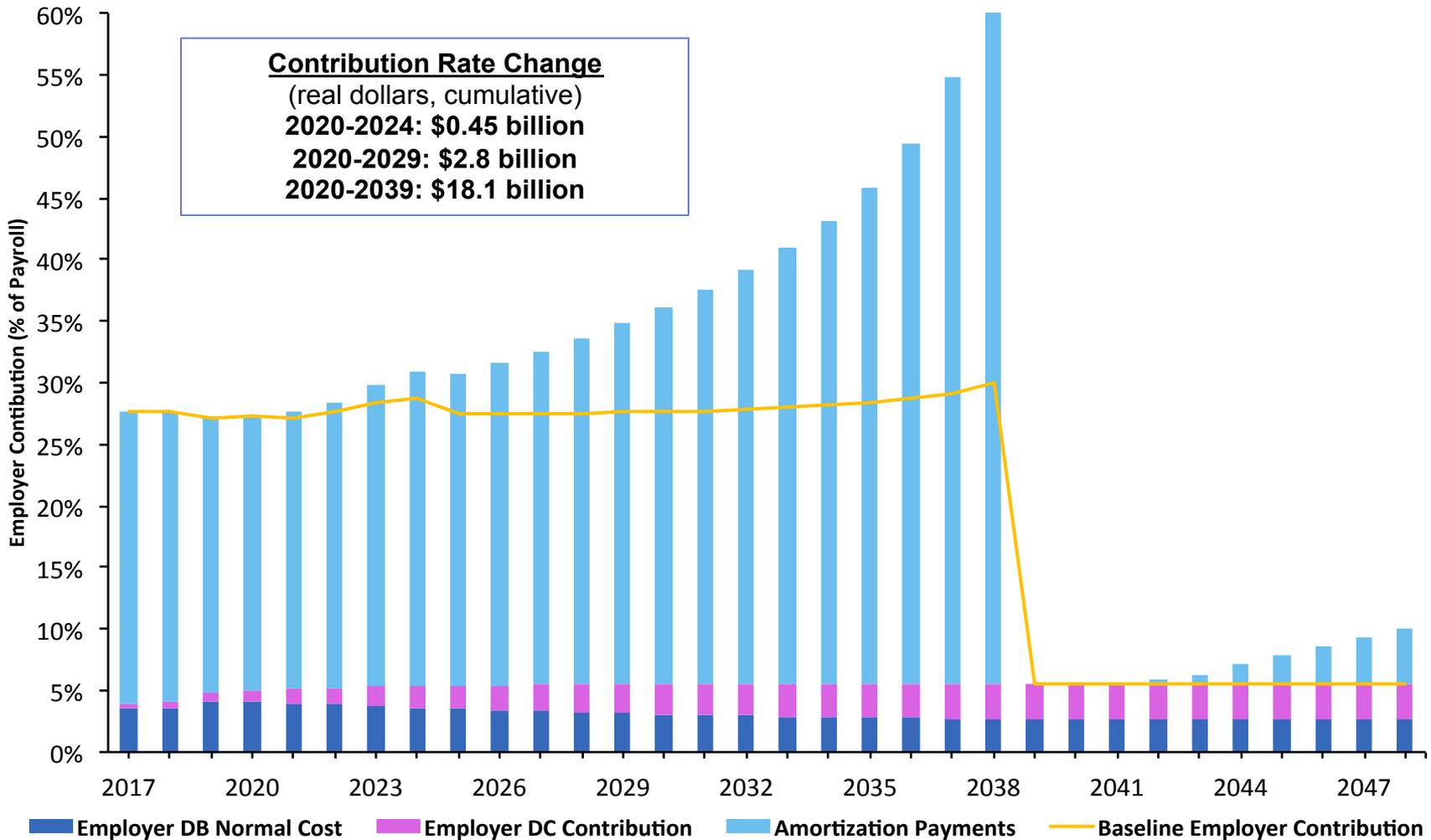
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MPSERS Employer Contribution Forecast (as % of Payroll)

Underperforming Assets: 6% Actual Return

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return 6%



Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.



MPERS Underperforming Assets

Is the Pension Plus Normal Cost Underpriced?

1. The unrealistic assumed rate of return is also a problem for the Pension Plus plan — i.e. defined benefits for members hired after July 1, 2010.
 - The defined benefit portion of the Pension Plus plan is dependent on MPERS achieving a 7% average return.
 - Even this might be too high given the new normal for investment returns.
 - Plus, the average MPERS returns over 15 years (5.1%), and 10 years (6.2%) are all lower than the 7% target for the Pension Plus plan, suggesting that when that plan starts to mature it will begin to see degrading solvency from underperforming investment returns.
2. If a 7% assumed return is overly optimistic and MPERS assets underperform, then the current Pension Plus plan's normal cost will have been underpriced ever since inception.
 - The state can pay more in normal cost now to avoid unfunded liabilities down the road, or keep normal cost low and pay unfunded liability amortization payments later to make up the difference between the underpriced benefit today and actual cost of benefits in the future (plus interest).

Pension Plus Comparative Normal Cost

(Amounts to be Paid in 2017-18 Contribution Fiscal Year, % of payroll)



| | Pension Plus Plan (2015 Val. Report) | Pension Plus Plan (Reason Forecast) | Pension Plus Plan (Reason Forecast) |
|---|--|---|---|
| Assumed Rate of Return / Discount Rate | 7% | 6% | 5% |
| Payroll Growth Assumption | | 3% | |
| Gross DB Plan Normal Cost | 7.9% | 9.6% | 11.8% |
| Employer Contribution | 3.1% | 4.6% | 7% |
| Employee Contribution (Weighted Average) | 4.8% | 4.8% | 4.8% |
| Max DC Contribution | 1% | 1% | 1% |
| Max DC Only Contribution | 3% | 3% | 3% |
| Total Employer DB Normal Cost + DC Rates | 4.6% | 6.1% | 8.5% |

Note: All figures are on an actuarial value basis and rounded. Normal costs shown are weighted averages for the tier. Total amortization payment includes 1.36% of payroll contribution for the early retirement incentive amortization payment.

MPERS PROBLEM: UNDERFUNDING AND CONTRIBUTION RATE VOLATILITY

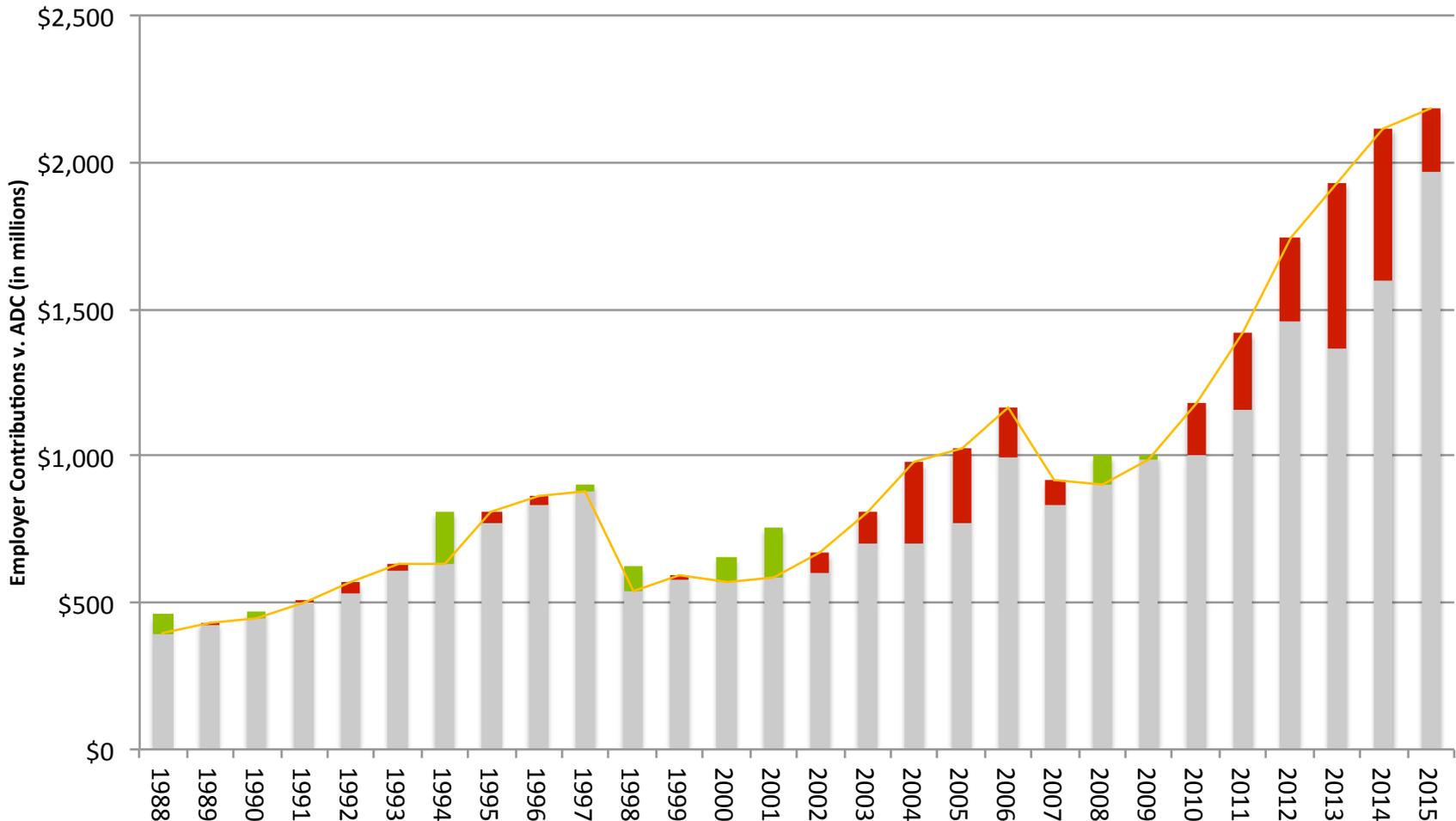
- The contribution rate volatility of the MPERS defined benefit plan has led to a pattern of underfunding actuarially determined contributions

MPERS Actuarially Determined Employer Contribution History

Actual v. Required Contributions, 1988 - 2016



■ Actual Contribution
 ■ Underfunded Contributions
 ■ Overfunded Contributions
 — Actuarially Determined Contribution

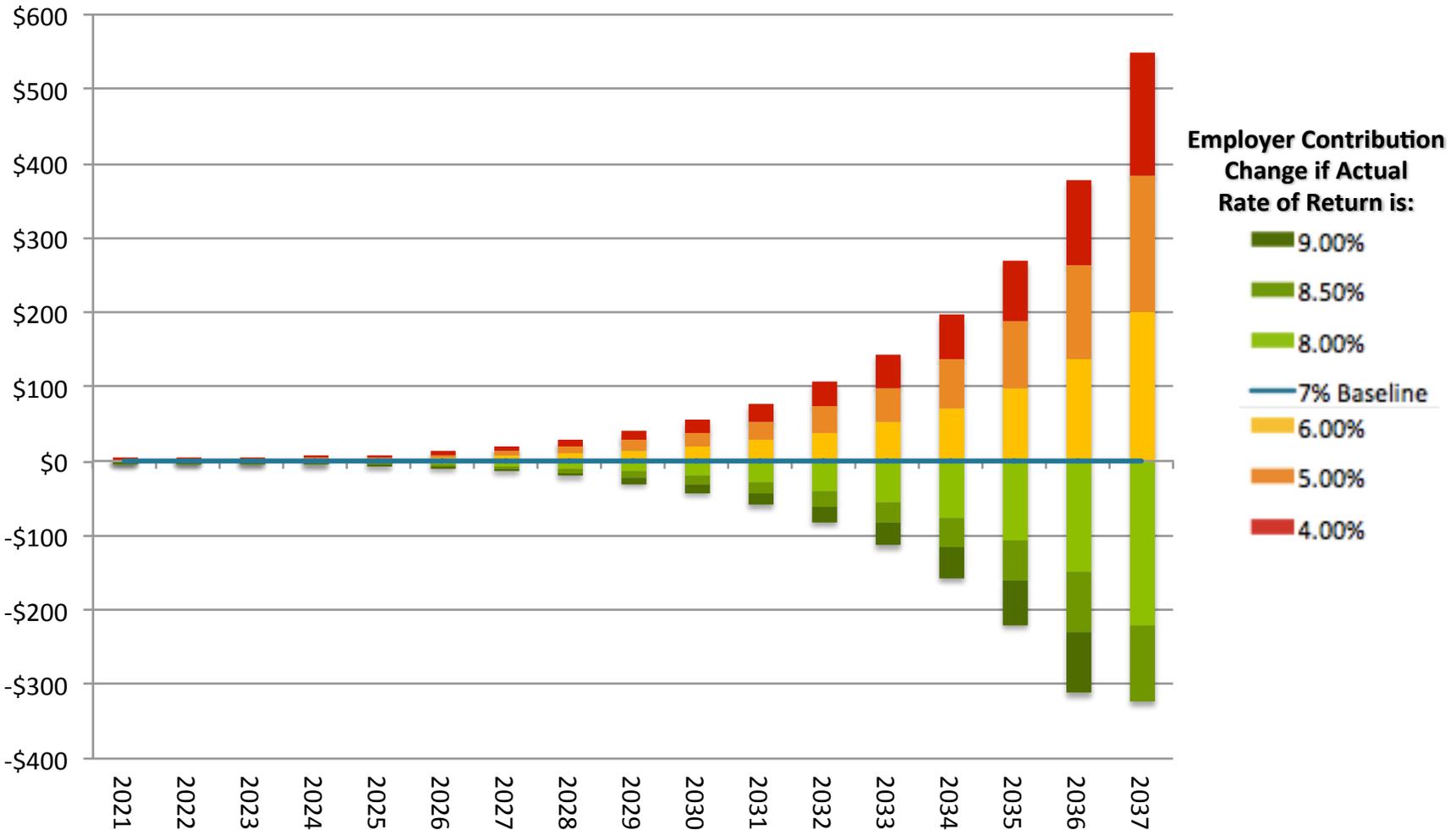


Source: Reason Foundation analysis of MPERS actuarial valuations and CAFRs.

MPERS Change in Employer Contribution Forecast (in \$ millions)

New Hire Volatility: Pension Plus Plan

Discount Rate 8% / 7%, Assumed Return 8% / 7%, Actual Return Varies



Note: Forecast includes inflation adjusted figures using the plan's inflation assumption. Years shown are contribution fiscal year end dates. Rate of return assumption and discount rates used are relative to the non-hybrid (8%) and hybrid (7%) tiers, as defined by the plan.

MPSERS PROBLEM: DISCOUNT RATE

- The discount rate is likely undervaluing the recognized amount of existing pension obligations

Challenges from Aggressive Actuarial Assumptions

Discount Rate Not Measuring Liability Risk



- The discount rate used to measure the value of already existing promised pension benefits is based on the overly optimistic assumed return, which is likely undervaluing the reported amount of pension obligations.
 - The discount rate of a pension plan is intended to be a measure of the risk of the plan's liabilities in order to determine the value all promised future benefit checks, measured in today's dollars.
 - MPSERS — like most public pension plans — uses a measure of risk in the plan's assets, i.e. the assumed rate of return on assets — as a proxy for the discount rate used to value the plan's liabilities.
 - However, the process of determining the value of all future promised pension checks should not depend on the risk of the assets, but the risk of the liabilities.
 - As a result, even though MPSERS has followed national trends in determining its discount rate, it has likely undervalued the existing amount of promised benefits and thus undervalued the total amount of unfunded liabilities.
 - See next several slides for a more detailed analysis.

MPERS Pension Debt Sensitivity

FYE 2015 Unfunded Liability Under Varying Discount Rates



| | Funded Ratio (Market Value) | Unfunded Liabilities | Accrued Liabilities |
|--|--------------------------------|-------------------------|------------------------|
| 8% / 7% Discount Rate (Current Baseline) | 63% | \$25.0 billion | \$67.4 billion |
| 7% Discount Rate | 57% | \$32.1 billion | \$74.5 billion |
| 6% Discount Rate | 51% | \$40.0 billion | \$82.4 billion |
| 5% Discount Rate | 46% | \$48.9 billion | \$91.3 billion |

Source: Reason Foundation analysis of MPERS actuarial valuations and CAFRs; figures shown are rounded.



MPERS Discount Rate Methodology is Undervaluing Liabilities

- 1. The “discount rate” for a public pension plan should reflect the risk inherent in the pension plan’s liabilities:**
 - Most public sector pension plans – including Michigan — use the assumed rate of return and discount rate interchangeably, even though each serve a different purpose.
 - The **Assumed Rate of Return** (ARR) adopted by the board estimates what the plan will return on average in the long run. ARR is used to determine how much should be contributed to the plan each year to ensure that promised benefits are paid in full. The rate usually combines the real rate of return and assumed rate of inflation.
 - Conversely, the **Discount Rate** (DR) is used to determine the net present value of all already promised pension benefits. Discount rate is supposed to reflect the risks of the liabilities— i.e. the risk that the plan sponsor will not be able to pay the promised pensions. As such, a discount rate represents the combination of a so-called “risk-free interest rate” plus a risk premium associated with the particular plan’s employers.

Continued...



MPERS Discount Rate Methodology is Undervaluing Liabilities

2. **Setting a discount rate too high will lead to undervaluing the amount of pension benefits actually promised:**

- All else equal, the higher the discount rate used by a pension plan, the lower will be the reported value of accrued liabilities (promised pension benefits). Conversely, the lower the discount rate used, the higher will be the reported value of accrued liabilities.
- Thus, in general, the use of a “high” discount rate undervalues the actual amount of pension benefits that has been promised.
- If a pension plan is choosing to target a high rate of return with its portfolio of assets, and that high assumed return is then used to calculate the value of existing promised benefits, the result will likely be that the actuarially recognized amount of accrued liabilities is undervalued.

Continued...



MPERS Discount Rate

Methodology is Undervaluing Liabilities

- 3. It is reasonable to conclude that there is almost no risk that Michigan would pay less than 100% of all retirement benefits promised to members and retirees.**
 - Michigan's constitution protects the guarantee of pension benefits.
 - The pension reductions in Detroit were voluntarily agreed upon as part of a bankruptcy settlement.

- 4. The discount rate used to account for this minimal risk should be appropriately low.**
 - The higher the discount rate used by a pension plan, the higher the implied assumption of risk for the pension obligations.



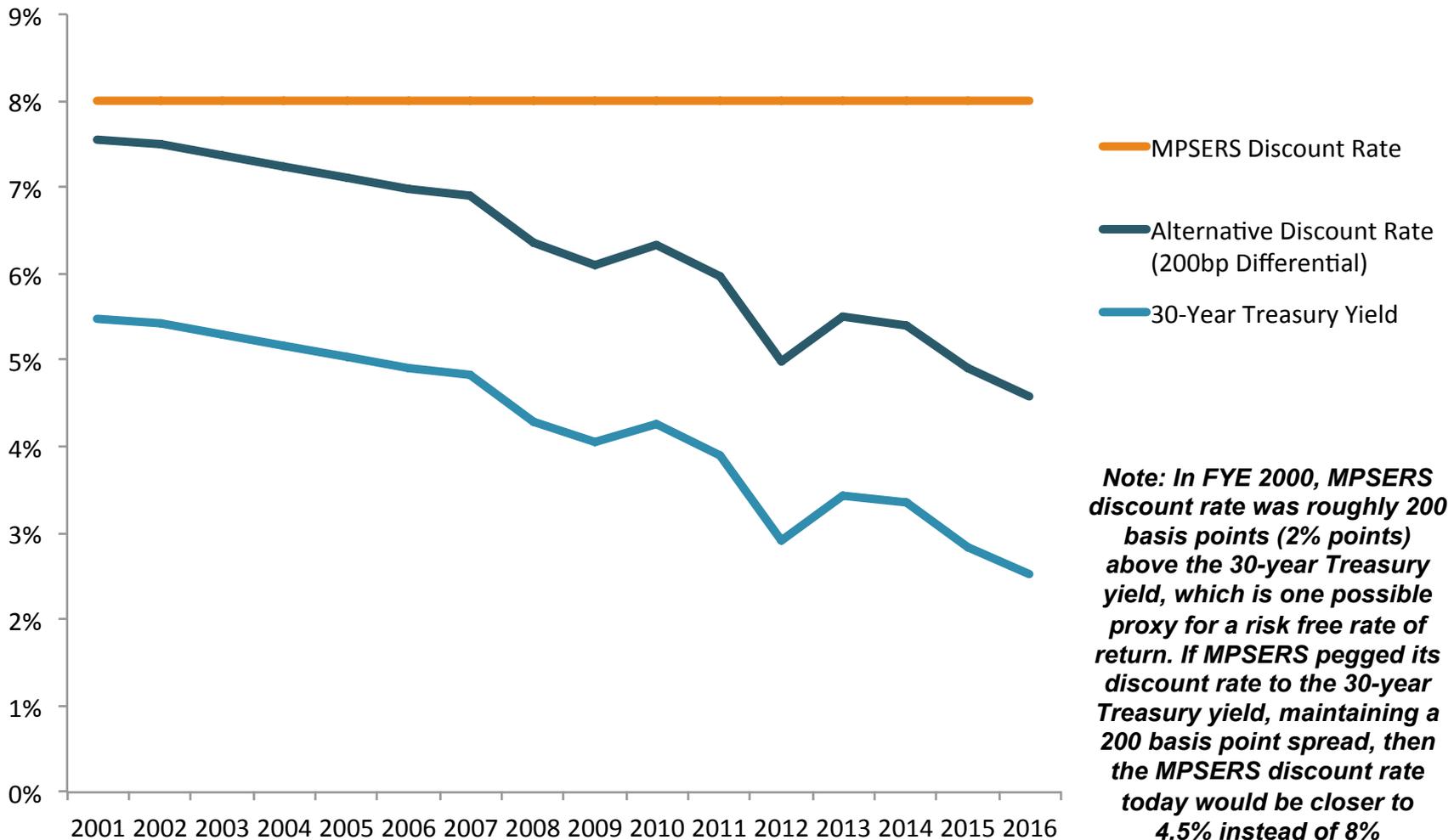
MPERS Discount Rate Methodology is Undervaluing Liabilities

- 5. In 2001, the yield on 30-year Treasury bonds was about 5.5%, and MPERS discount rate was 8%.**
 - This implies that MPERS was pricing the risk that the state would not be able to fully pay promised pension benefits at about 2.5% (250 basis points) above a 'risk-free' rate of return.

- 6. Over the past 15 years as the yield on Treasury bonds has substantially changed, the discount rate has not been modified accordingly.**
 - If MPERS had pegged its discount rate to the yield on 30-year Treasury bonds back in 2001, then the discount rate used by the plan today would be about **4.5% today (2016)**.



Comparing Change in Discount Rate to the Change in Risk Free Rate, 2001-2016



MPERS Discount Rate Methodology is Undervaluing Liabilities



- 7. Using an inaccurate discount rate has resulted in a systematic undervaluing of pension liabilities.**

Better discount rate practice options:

- The best measure of MPERS's risk would be the yield on Michigan's general obligation bonds.
- Alternatively, the plan could pick a certain risk premium amount -- such as 1% or 2% -- and add this to a "risk free rate of return" such as the a 30-year Treasury Bond.
- At a minimum, the discount rate should be reduced as risk free rates of return – i.e. Treasury bills or 30-year Treasury Bonds – decline.

MPSERS PROBLEM: PAYROLL GROWTH ASSUMPTION

- The payroll growth assumption is likely slowing down the process of paying down the unfunded liabilities

Challenges from Aggressive Actuarial Assumptions

Overestimating Payroll Growth Trends



- The payroll growth assumption of the plan has been disconnected from the historic pattern of changes in payroll for MPSERS. The overestimation of payroll growth artificially reduced the amount of unfunded liability amortization payments on a dollar basis.
 - Unfunded liability amortization payments have historically been calculated to be the same amount annually as a percentage of the active member payroll for MPSERS. This means the actuarial assumption about how much payroll will grow from year to year is important.
 - For over a decade, the payroll growth assumption has been 3.5%. But the average actual growth of payroll since then has never been greater than 1.15%, and the average annual change in payroll has been -2.23%.
 - Between fiscal years ending 2001 and 2015, the average payroll growth was -0.16%.
 - This means that actual amortization payments have been less than actuarially assumed for more than a decade, even when 100% of the actuarially required contribution has been paid.



Challenges from Aggressive Actuarial Assumptions, 2001-15

Actual Change in Payroll v. Assumption

