9/18/2018

2018 Annual Strategic Letter- Q2 Summer Update

In our previous 2018 Strategic Letters we provided an overall perspective of PERA's key strategic goals and the challenges, from an asset point of view, in meeting our goals. At that time, we identified three significant strategic challenges:

(1) The current expected returns of our portfolio is short of our long-run actuarial discount rate. At the time we identified this to be a roughly 1.25% gap. We identified the challenge going forward is to "*Bridge the Gap*".

(2) We highlighted that we need to "*Bridge the Gap*" in the face of a likely lower-return investment environment going forward. In particular, we highlighted the potential modest returns coming from equities over the next 10-years.

(3) Maneuvering a late cycle economy in the short run to achieve our long run goals. This is quite a meaningful challenge. For instance, even if we are able to build a bridge to fill the return gap and meet our 7.25% expected returns, the ***way*** we achieve those returns are important. For instance, if we under-perform our time-weighted return targets in the first 5 years, but over-perform in the next 5 years to arrive exactly at 7.25%-- we actually lose wealth. More to come on this point.

Thus, the purpose of this letter's *Summer Update* is to discuss any changes to the strategic challenge and to update any progress we have made.

Key Goals

As a reminder, PERA's 5-year Strategic plan (2018-2022) guides the Investment Division staff priorities. The key goals and priorities from this plan are:

1. Maintain an appropriate strategic asset allocation (SAA) to meet the actuarial discount rate assumption.
2. Provide ten-year annualized returns that equal or exceed the policy benchmark, net of fees.
3. Work towards a 30 year funding period for unfunded actuarial accrued liability
4. Achieve a total investment cost at or below 85 bps

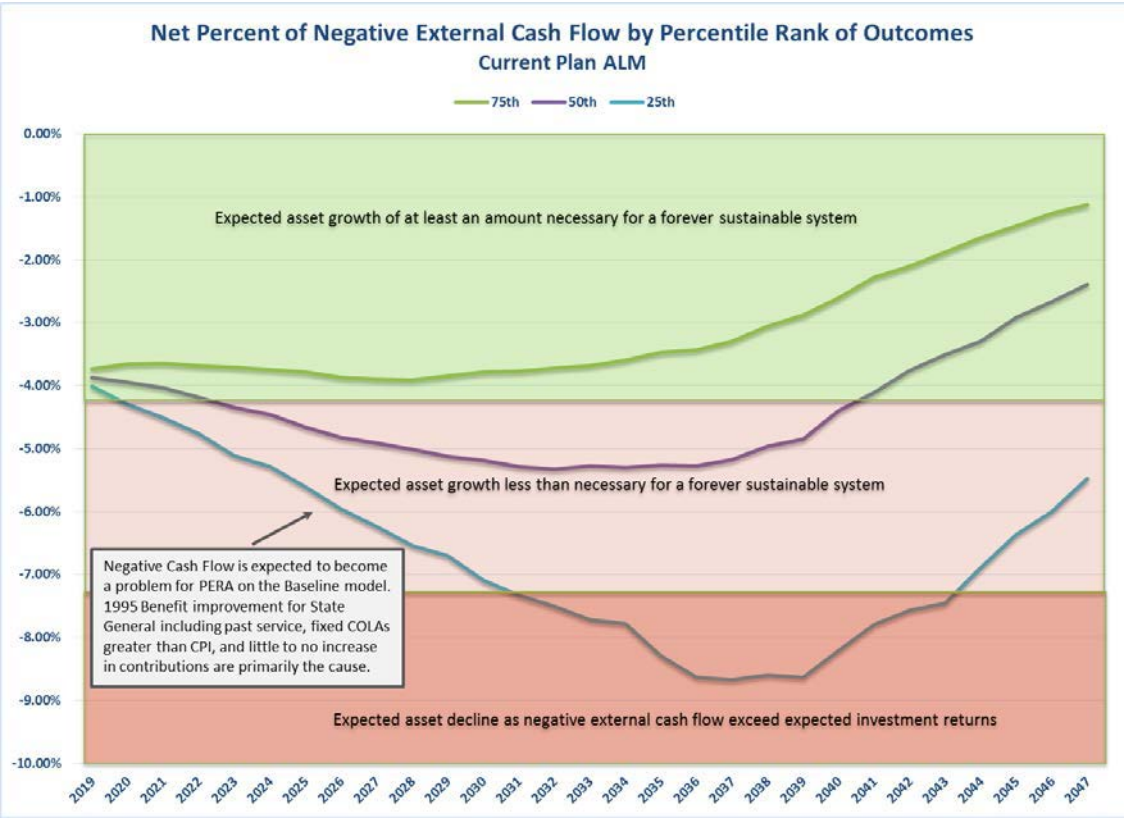
Strategic Challenge Update

Over the last quarter, we have made progress in addressing our challenge. We worked collaboratively (Board, Staff & Consultant) to study Risk Balancing initiatives with adoption at the August Board retreat. This framework is important going forward because it provides a lens to better allocate Beta risk and by using unconventional allocation techniques we are able to increase our expected return without materially increasing our expected volatility, thus improving our risk/reward ratio.

We've chronicled clearly the return challenge we face going forward. But, over the last quarter we've done some additional work in Asset-Liability space to better understand the nature of our liabilities and how our investment strategies impact the liability or don't impact it. While we know that making up past unfunded liabilities is solely not an investment solution, via our Asset-Liability work we have revealed two additional very important issues.

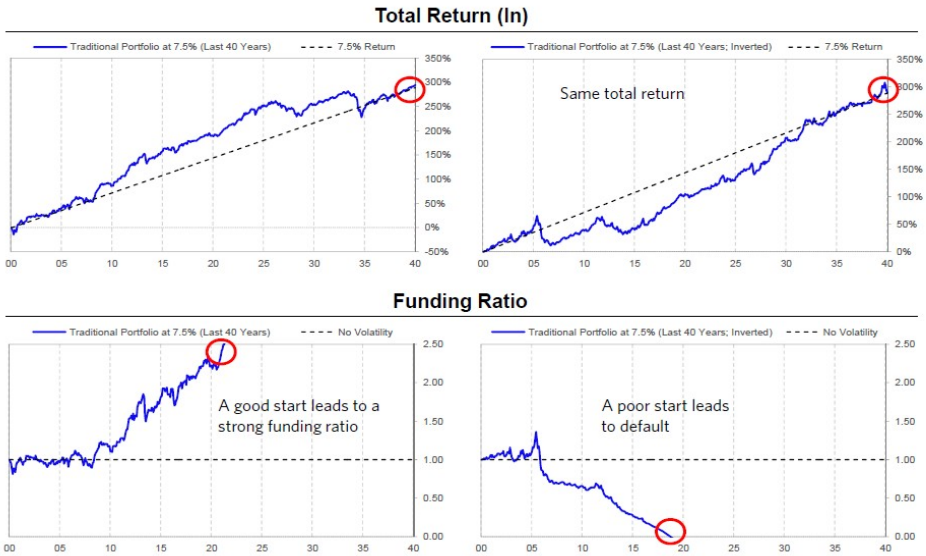
First, over the next 15 years or so, we will see a demographic and liability bulge, culminating primarily from Tier 1 retirees, that we project will increase our cash outflow of our earnings from roughly 3.75% currently to nearly 5.5%. This is a cash outflow growth rate that is outside our comfort zone and material problem. This is our base case—meaning if we hit our 7.25% returns over this period. If we do something less, the picture is worse.

The below chart highlights this problem. The chart is a summary of the distribution of 500 monte carlo simulations of varying investment return scenarios juxtaposed with our expected cash outflow of our liabilities. For instance, the purple line is our base case assumption, which, as mentioned, burgeons to roughly a negative 5.5% cash outflow when we hit 7.25%. In the bad case of investment returns, we are unsustainable. In a nutshell, our goal is to build a portfolio and plan design that minimizes the bad case outcome to a level that we can live with. Unfortunately, investments can only do so much. It is plan design that really moves the needle on this issue.



Second, path dependency of our returns matters a lot. We discussed this at our Board retreat in the summer, but it isn't even enough to get a 7.25% return over the next 10 or 20 years. The sequencing of the returns matters. For instance, over a 10 year period we can average a 7.25% return, but in the first 5 years we can be below 7.25% and in the second 5 years above 7.25%. We still average 7.25% over the period, but because we pay benefits monthly, the wealth of the fund diminishes—meaning we have less actual NAV to compound over that period even though we average 7.25%.

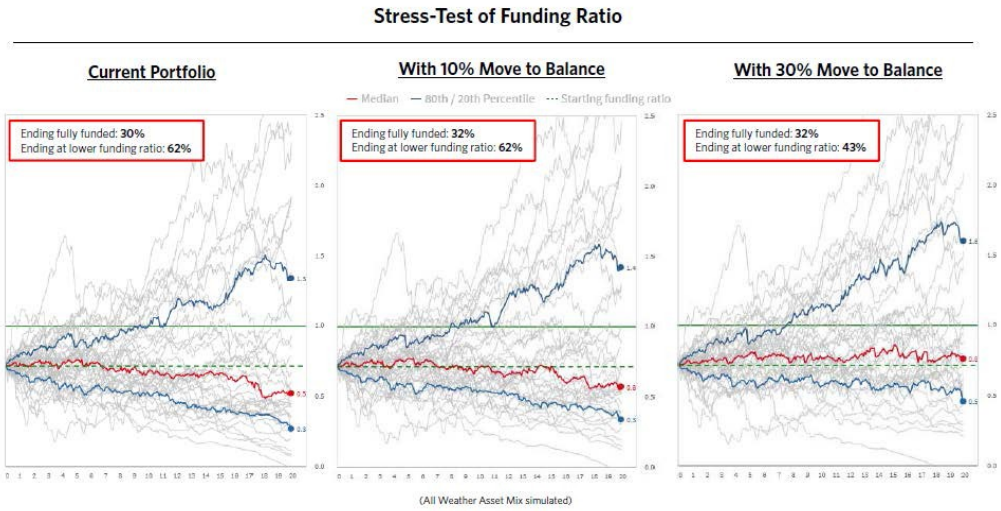
The below graph, provided by Bridgewater, is an illustration of this phenomena. It shows two different return paths with the same exact terminal return, one path with the good returns front loaded during that period and another path with the bad return front loaded. The illustration (not simulated for PERA) shows what the impact is on a hypothetical funding status—not good.



So, what is an investment team to do? It seems the deck is stacked against you. Again, there are not solely investment solutions to these problems, plan design actually has a bigger impact to solve these problems. From a strictly investment solution point of view, we keep coming back to Risk Balance.

The following graph is more simulation work we have done. As mentioned, the Board adopted a 10% move into Risk Balance with a plan to move to 30% over a multi-year horizon. The below simulations show the impact of moving the portfolio in this direction has on the funding status, but particularly in bad scenarios. For instance, over a 20 year horizon, moving to a portfolio that is 30% risk balance improves the probability of being fully funded by only 2% from today's current portfolio. However, the probability of ending up a lower funded ratio over that 20 year horizon decreases significantly. This is reduced from a 62% probability to a 43% probability. You can visually see this in the bottom blue line and red line improvement, i.e. those lines moving up.

While this portfolio enhancement is meaningful to help mitigate downside funding scenarios, at the same time it speaks to the limitations on investments to actually make-up unfunded liabilities. There is great value to our approach, but still it is not a silver bullet and does little to make up for the past.



Environment

PERA's fiscal year was divided into two separate and distinct market experiences. During the second half of 2017, the market continued on its path of synchronized global growth and an extended market rally, favoring systematic market exposures ("Beta"). However, during the first half of 2018, this market sentiment diminished, and investors observed market disruptions due to the divergence of Central Bank policy, escalated trade war threats, and related currency wars. For this time period risk elevated, and a more defensive portfolio was required in order to preserve the Fund from downside impacts. PERA had anticipated the re-emergence of volatility into the markets, and mitigated loss through strategic asset allocation initiatives such as, meeting allocation targets to better balance risks across the portfolio, as well as maintaining a lower Beta exposure to the Policy Index.

This tale of two markets is described in the below chart showing 30-day realized market volatility for assets. From July to December 2017, volatility was quite stable and low, at the turn of the calendar this spiked significantly reflecting the disruptions as discussed.

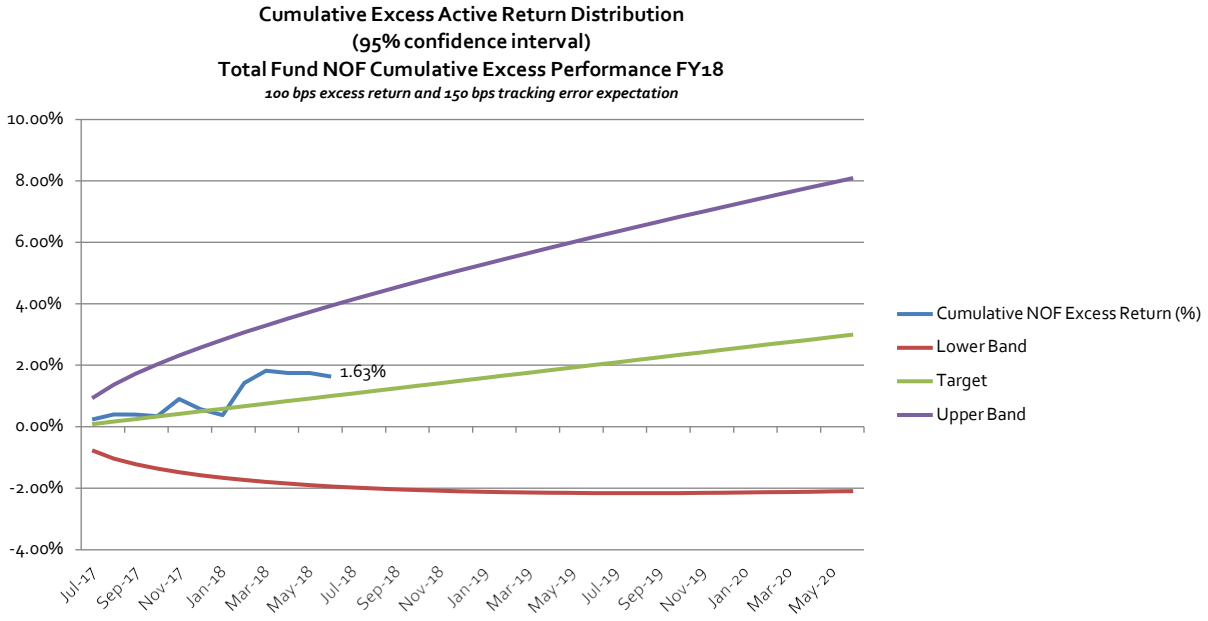
This divergence has shown itself in the performance of markets. None more striking is the big divergence we've seen between emerging markets and developed markets. The chart below shows this well. In the white is the return on US equities, the orange is emerging market equities. This is almost 21% performance spread. This should come as no surprise. Emerging markets are volatile. We expect over a long period of time a spread over developed markets, but the price is excess volatility and the large drawdowns that come with it.

Performance

As of June 30, 2018, the investments in the PERA Fund returned 6.90%, net of fees. The Fund balance at the close of the fiscal year was approximately $15.36 billion. PERA is pleased with the performance generated within the fund, resulting in a net excess return of 1.63%, as compared to the Policy Index. This equates to an approximate dollar value-add of $240m over the policy index, reflecting a premium to PERA for prudent diversification, reasonable illiquid appetite, and favorable active management.

Time Period	PERA Return	Benchmark Return	Excess Return
One-year	6.90	5.27	+1.63
Three-year	6.07	6.21	-0.14
Five-year	7.31	7.33	-0.02
Inception to Date	9.00	8.90	+0.10

Additionally, to track our excess return profile we have provided the following cone chart. As a reminder, in the Risk Budget adopted by the Board in March, there was a target expected return of 1% for excess return or alpha over the long run. In addition, we expect about 1.5% excess risk or tracking error to try to accomplish the excess return target. The cone chart or confidence band sets expectations for these targets. The green line sets forth that 1% target, the blue is what we have actually achieved, cumulatively, and the purple and red lines are confidence bands. Meaning, with 95% confidence, we should expect our performance to fall between these bands at any given point. Remember, there is no free lunch for alpha or excess return.



What is Next?

Execution, execution, and execution. Staff has its marching orders with the adopted Risk Budget and the enhanced Strategic Asset Allocation to include Risk Balance. We will be spending more time heads down, focused on implementation. That means improving on existing processes and ensuring we have the right resources to implement.

Additionally, Investment Staff is tentatively planning our first ever retreat in December, which we hope to make an annual event. The goal for the retreat is multi-faceted. It is for team building, reflection, and priority setting for next calendar year. Our aspiration would be to come out with an outlook and priorities to hit the ground running for 2019 so we can build our work plan and adjustments to the Risk Budget for Board/IC consideration at the beginning of the calendar year.

2018 Work plan Update

At the beginning of the year we set forth a work-plan and some key goals for the year. We have met quite a few, particularly on the active management side. Below are highlights of what we have accomplished on that plan.

Completed initiatives include:

- ✓ Education on Risk Budgeting
- ✓ Adopted an active risk budget
- ✓ Adopted an active management (alpha) target
- ✓ Begin implementing active risk budget and glide path to alpha target
- ✓ Education on Risk Balanced
- ✓ Adopted an enhanced Strategic Asset Allocation Policy (passive market beta) that increases expected return via risk balancing efficiencies.
- ✓ Adopted Reference Portfolio (Simple, indexed portfolio) for benchmarking
- ✓ Completed economic and demographics experience study, changed actuarial return assumption
- ✓ Completed Asset-Liability study and presentation at Board retreat

Conclusion

As we continue to move strategically to "*Bridge the Gap*" by incorporating Risk Balance and continued improvement of our active risk, we need to be aware that the current environment around us is moving to a later stage business cycle that increases market volatility and historically results in modest asset returns. We will need to maneuver these short run risks to execute our long term strategy and path. This has implications for the path dependency of our returns and how that impacts our funding status.

We have also learned that our liability, specifically our projected future cash outflows, are on an unsustainable path. Investments has a meaningful, but limited impact on this effect. Our strategy shows it helps minimize downside funding scenarios, but is no silver bullet and does little to cure past liability ills. This is the domain of plan design, which can actually move the needle materially to help these issues and ensure PERA is a forever sustainable system.