Portfolio Strategy Update

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CalPERS

Key messages

- The 6.8% discount rate of the PERF (and those peers with similar discount rates) requires adopting a strategic asset allocation reliant on harvesting the equity risk premium.
  - This harvesting strategy is volatile and risky, and success requires maintaining exposures over the long-term
- Sustainably delivering an excess return of 50 bps is projected to reduce by 12% total contributions over the next 30-years.
- The current SAA, combined with our move to being a more active manager, will lead to material changes in the PERF portfolio.
  - Private assets will become a larger part of the portfolio. These asset classes are expected to harvest risk premia and provide dollar value add (‘alpha’)
  - We will take more actionable active risk in the public markets, with the expectation of increasing dollar value add
- **The increase in active strategies should not materially change total portfolio risk.**

The risks of harvesting strategies

- Farmers work hard to sow, manage, and harvest crops
- Crop of any given year depends very much on the weather, which is beyond farmer's control.
- Outcomes for given year hard to predict
- Long term outcomes depend on climate, which is more predictable than weather but still beyond farmer's control
- Farmer sows crops suited to the climate, and harvests whatever comes each year

Markets are volatile and uncertain. This last year, for example, held several surprises.

Our expectations going into 2022:

- Growth to slow towards historical averages
- Central bank policy tightening to get underway; market pricing too shallow
- Macroeconomic volatility to continue as pandemic induces persistent changes in behavior
- Macroeconomic regime change possible but not yet apparent

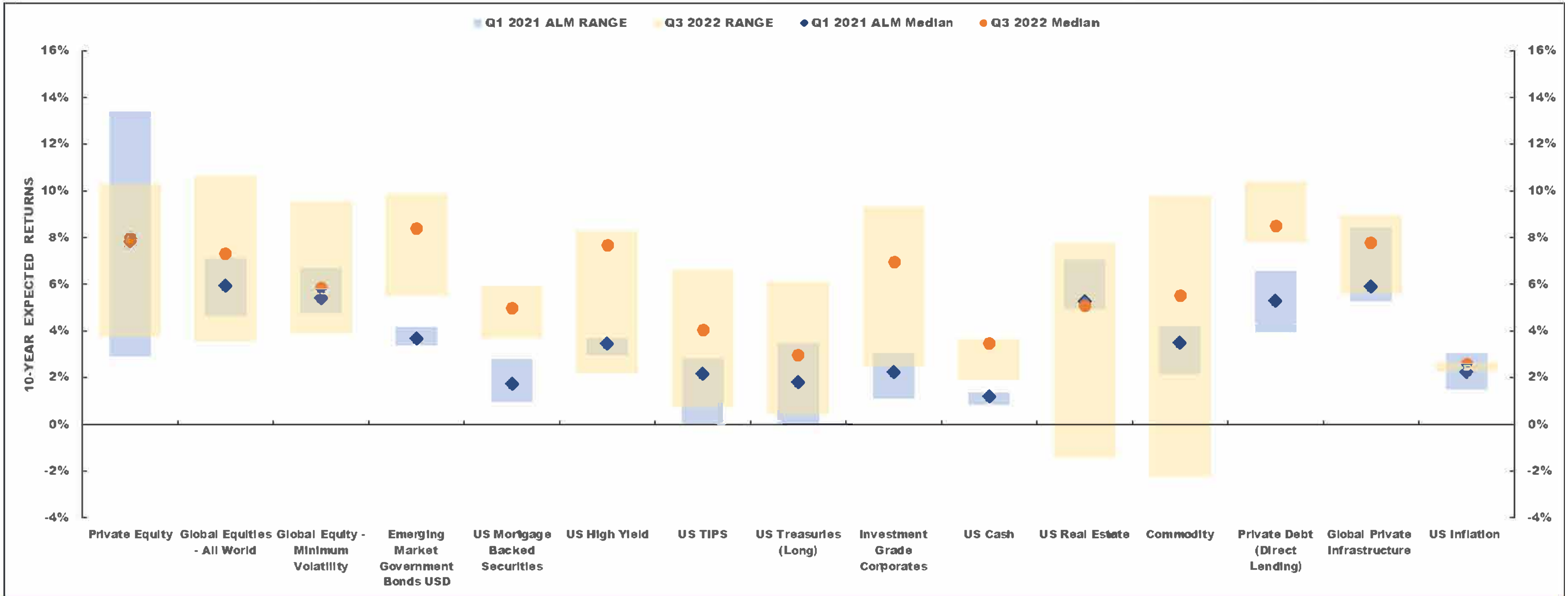
What happened relative to expectations:

- Ukraine-Russia conflict and slow global re-opening pushed inflation higher
- Central bank policy tightening faster than expectations

What might we expect into 2023?

- Headline inflation to decline towards 2% but core inflation to remain above policy targets, keeping central bank policy tight
- Economic growth continues to slow and potentially decline. The risk of a recession is high
- Macroeconomic volatility to remain elevated and the dispersion of growth expectations to converge throughout the year.
- Heightened volatility in asset returns

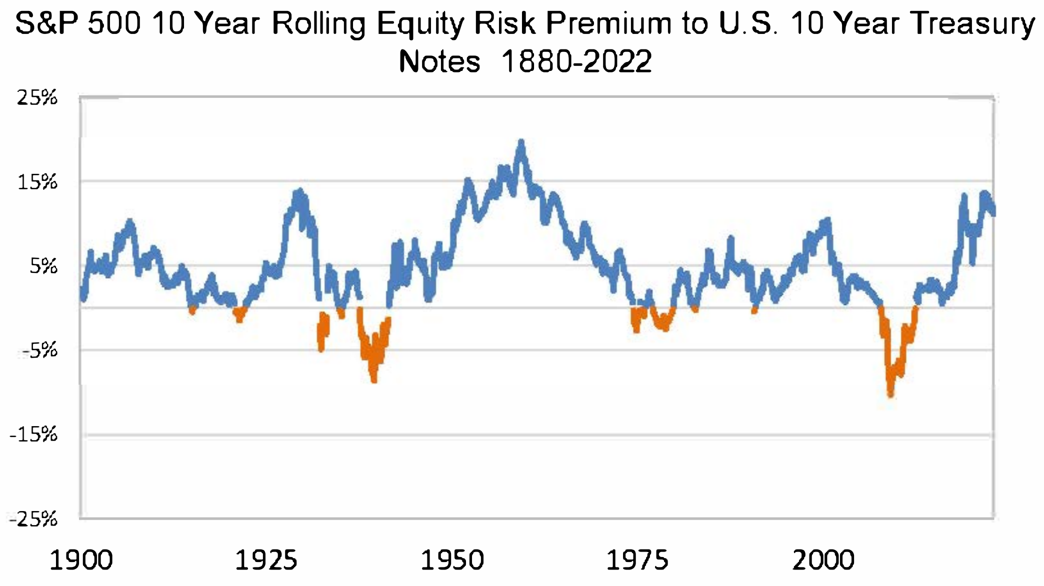
Future uncertainty is reflected in the diversity of expert opinion regarding 10-year CMAs



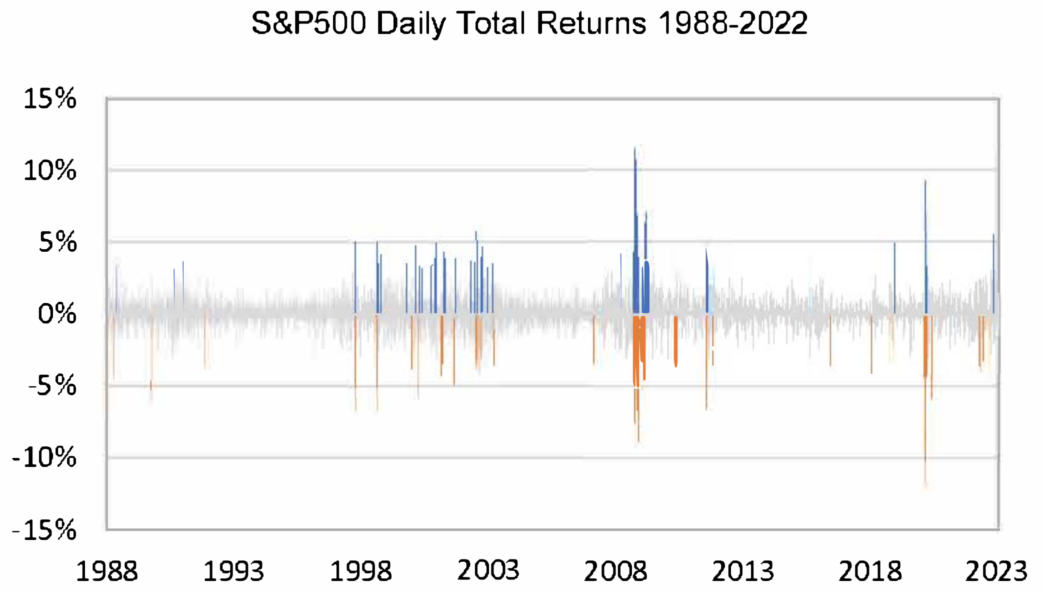
Our most recent survey (yellow rectangles, orange dot) indicates projected 10-year returns have increased since our ALM (blue rectangles, blue diamond). The yellow boxes indicate expert opinion regarding future returns remains diverse for all asset classes. Public equities (2nd from left), for example, now have a median projected return just over 7%, with a range of 4% to 10%.
This uncertainty, and the fact expert opinion changes over time, is one of the reasons we regularly review the strategic asset allocation.

Source: CalPERS surveys of external managers
Data as of March 31, 2021 and September 30, 2022

Harvesting the long-term equity risk premium comes with a lot of volatility, as illustrated by this history of equity returns



Source: Shiller. CalPERS calculations



Source: Haver Analytics

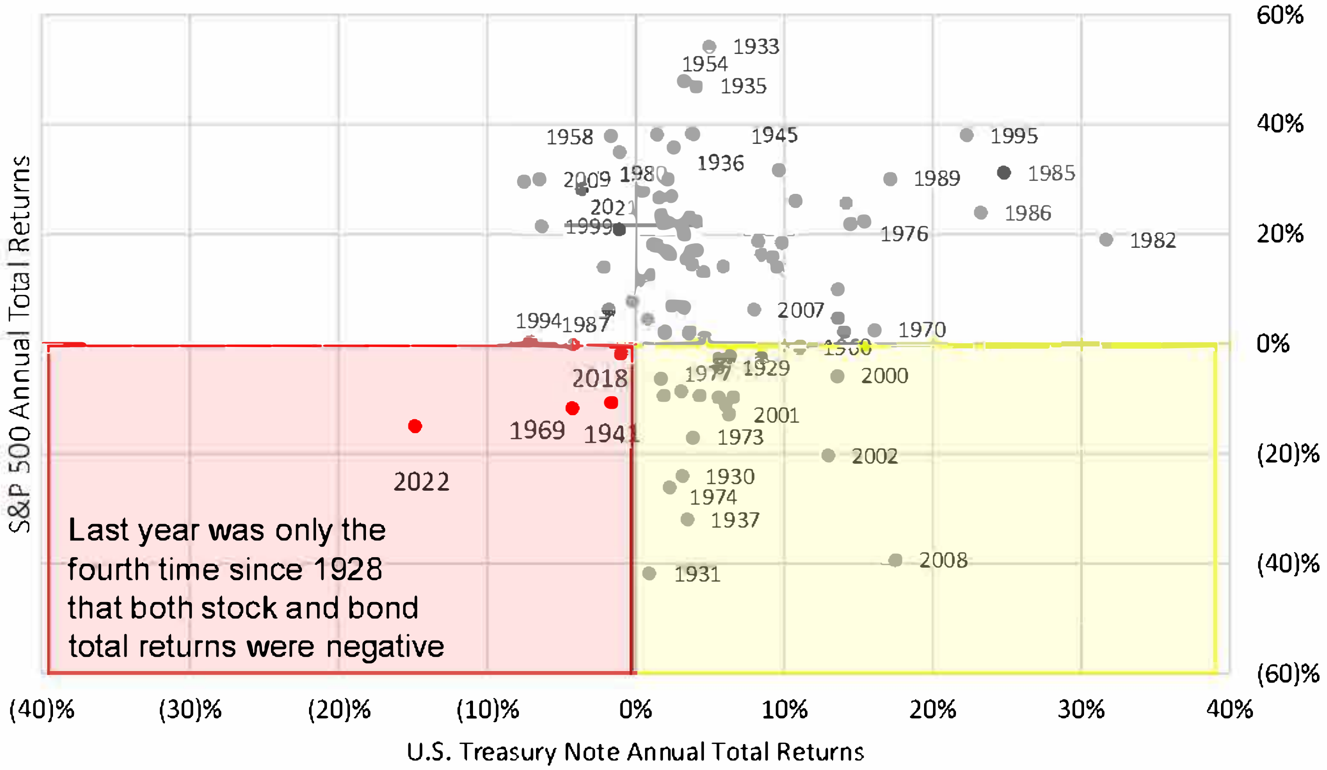
Over the last 120 years, the historic rolling 10-year S&P equity risk premium has been negative for roughly 10% of the time. So, a reasonable horizon for harvesting the equity risk premiums is measured in decades, not years.

Extreme equity returns come in bunches. Market timing is difficult, as getting out to avoid hard times may lead to missing good times. Like the farmer, to be successful over the long run we need to persist, believing the good times will offset the bad.

Equity and Bond Returns, and the exceptionality of 2022

- This scatter plot compares equity and bond total returns of each year since 1928
- There are only four years – including last year - when both equity and total returns were negative (red zone)
- Bonds most often have positive returns when equity returns are negative (yellow zones)
- Last year was unusual, the result of the market correcting after a prolonged period of very low interest rates driving up valuations in all asset classes
- Rising rates may have bonds revert to their natural role as a nominal store of value (yellow zone)

Annual Total Returns 1928-2022
S&P 500 versus U.S. 10 year constant maturity Treasury Note



Source: Shiller. CalPERS calculations, based on monthly frequency reported as at December calendar year

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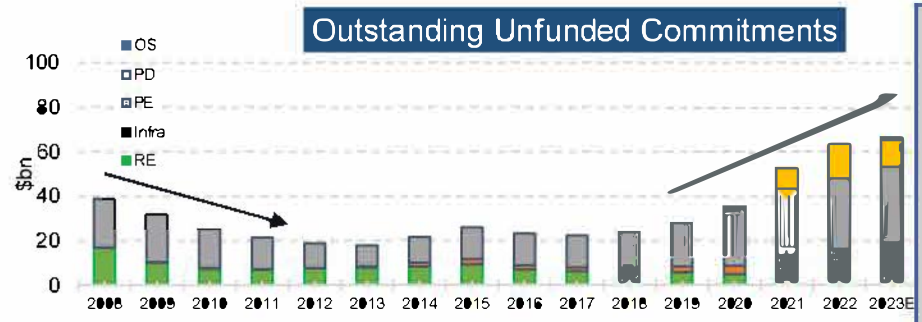
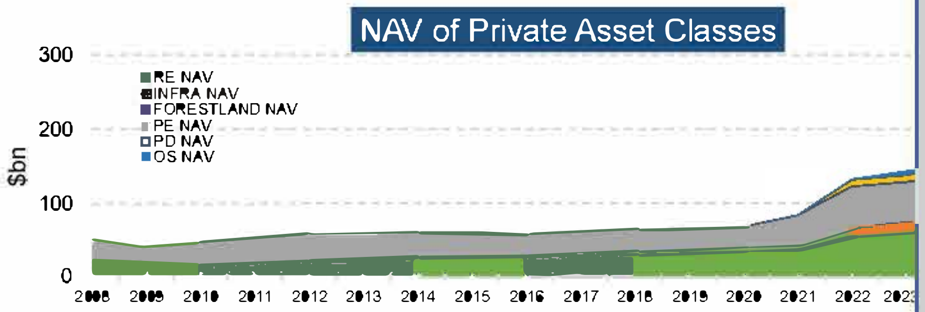
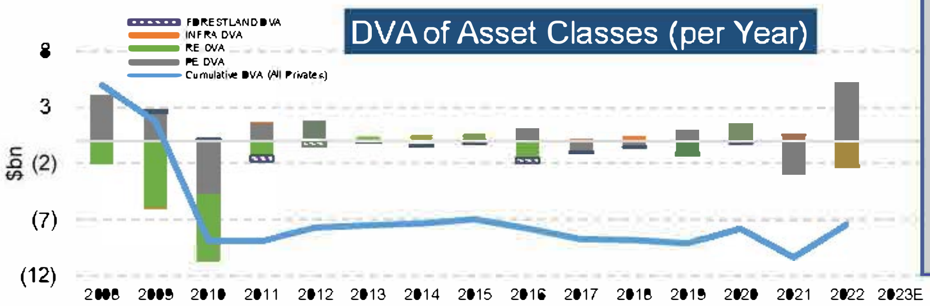
Private Asset Strategies - sources of beta and alpha







Details of projections to be discussed in closed session.

Though the SAA allocates a percentage of the total portfolio to private asset classes, actual private asset class outcomes – pacing, commitments, drawdowns, disbursements - are based in dollars. As a result, the actual percentage of total portfolio invested in private asset classes can and does vary from target.

CalPERS has a varied history with private assets. Post GFC CalPERS reduced commitments to private assets (top exhibit), leading to a lack of significant growth in the net value of private assets (second exhibit).

Since the GFC our private asset classes have, until recently, added little dollar value add (bottom exhibit). This outcome is the result of

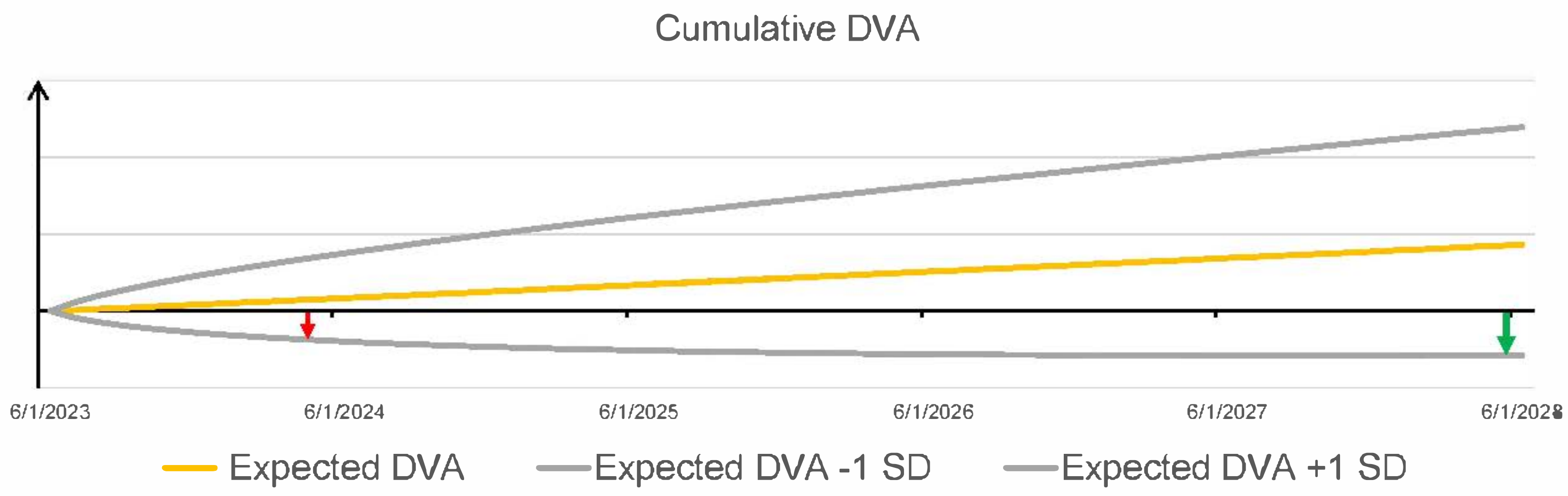
- inconsistent capital deployment,
- a lack of diversity and cost efficiency in private equity

These factors were addressed through recent reviews of our private asset strategies.

Our new strategy, and focus on dollar value add going forward, will change this trend.

Active strategies are expected to add value over time

- Active strategies are expected to add value over time, though year to year outcomes can vary.
- The example (exhibit below) illustrates a strategy with expected excess return of 75bps and 160 bps of tracking error. The ratio of excess returns to tracking error is known as the information ratio. The information ratio in the example is 75/160 ~ 0.46.
- Active returns are volatile, as the probability cone below shows. The example strategy has a loss probability of 30% over one year (red arrow at the left of exhibit), and 15% over five years (green arrow at the right of exhibit). Most strategies in private market and public markets have expected horizons greater than 5 years for generating value add.
- Active strategies are diversifying, expected to add excess returns without significantly increasing total portfolio risk



Liquidity, and "Staying On Strategy"

- Our strategy harvest scalable long term risk premia, and adding value relative to the SAA, will use liquidity
- To "stay on strategy", we need sufficient liquidity to maintain our SAA and active strategies during stress periods
- CalPERS investment office manages total portfolio liquidity on a forward-looking basis.
- We are comfortable with our current pacing for private assets.
- We regularly monitor and assess the liquidity needs our portfolio.