Investment Committee Semi-Annual Activity Report

as of June 30, 2018

7. RISK MITIGATING STRATEGIES AND INNOVATIVE STRATEGIES & RISK

CalSTRS RMS Semi-Annual Report

CALSTRS

Program Description

CalSTRS Risk Mitigating Strategies Program (RMS)
$20.0 billion

Long US Treasury	Trend Following	Global Macro	Systematic Risk Premia
$9.2 billion	$8.4 billion	$2.4 billion	$0

- RMS was established in 2016.
- RMS invests in strategies that have potential to provide protection against equity market downturns.
- Program Benchmark: Custom benchmark based on the respective target weights of each RMS component: 40% long-duration U.S. Treasuries (UST), 45% trend following, 10% global macro and 5% Systematic Risk Premia (SRP).

RMS Portfolio Allocation

Market Value as of June 30, 2018: $20.0 billion

Strategy	Market Value 06/30/2018	Market Value 12/31/2017	Changes
Trend Following	8,408	7,773	635
Long Duration (UST)	9,217	7,637	1,580
Global Macro	2,365	2,059	306
Systematic Risk Premia	-	-	-
Total	**19,990**	**17,469**	**2,521**

Note: All figures are in millions.

Strategy	Allocation 06/30/2018	Target Allocation	Variance
Trend Following	42%	45%	-3%
Long Duration (UST)	46%	40%	6%
Global Macro	12%	10%	2%
Systematic Risk Premia	0%	5%	-5%
Total	**100%**	**100%**	0%

RMS Status	12/31/2017	6/30/2018
Actual Allocation	7.8%	9.0%
Target Allocation	6.0%	9.0%
Variance	1.8%	0.0%

Top Risk Factors

Global macro strategies generally rely on top-down economic analysis while trend following strategies can benefit from medium- and long-term price trends. While both strategies invest in the most liquid instruments in equity, fixed income, currency and commodity markets, they could be vulnerable to any unforeseen geopolitical or natural disaster events depending on the positions taken. Trend following strategies could also suffer if the market is choppy, with no clear long term trends to follow. The UST component was designed to immediately benefit in any risk event, be it political, geopolitical, economic, liquidity, war, terrorism or natural disaster-related, but tends to suffer as economic activity and inflation rise.

RMS Program Developments

Managed Account Structure: RMS seeks to convert investments with certain existing managers to the dedicated managed account structure to reduce expenses, increase control and improve transparency of its assets. As of June 30, 2018, all but two accounts are structured with the managed account set up or are managed internally.

Management Fees: RMS has been negotiating, with some success, to lower the management fees of its trend following and global macro managers. One trend following manager recently agreed to shift to the original base plus incentive fee structure. This allowed CalSTRS to pay lower overall fees given the fund's underperformance over the past two years.

Ongoing RMS Implementation: RMS reached its long-term target allocation of 9% of the total plan in Q1 2018. The RMS team invested an additional $2.5 billion in Q1 2018, of which more than 50% was to fund the UST portfolio. RMS also funded one new global macro manager in Q1 2018. In Q2 2018, staff continued to conduct due diligence on and work on the recommendation memos for two high conviction SRP managers and one trend following manager to be presented to the internal RMS Investment Advisory Committee in Q3 2018.

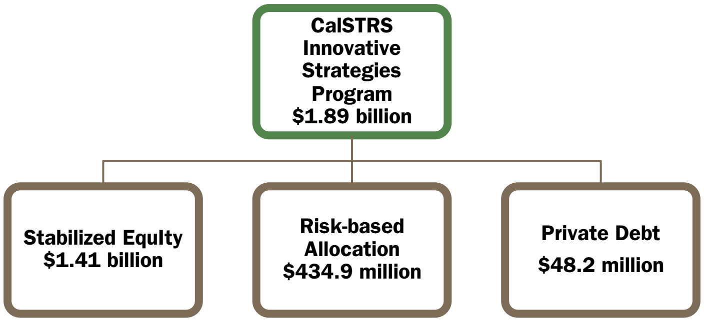
RMS Program Consultant and Advisor

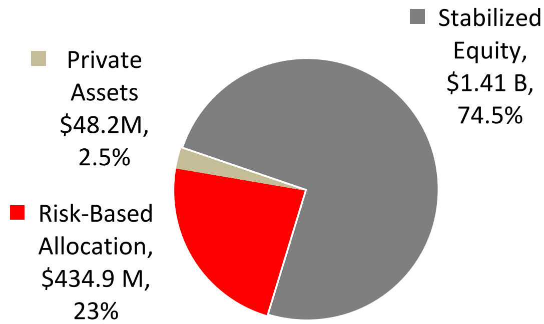
Consultants: Pension Consulting Alliance and Meketa Investment Group provide guidance to the Teachers' Retirement Board and staff regarding investment strategy, industry best practices and policy matters. Meketa also serves as an oversight consultant for RMS, providing the board with an independent assessment of the program's overall development. RMS proactively updates Meketa on program implementation, investment decisions and fund performance.

External Manager Adviser: Lyxor Asset Management provides guidance on a variety of implementation matters, including investment strategy, portfolio construction and manager selection.

CalSTRS Innovation Semi-Annual Report

Program Description





- Established in 2011
- Primary goal of preserving Teachers' Retirement Fund capital by diversifying its global equity exposure and improving the risk/return characteristics of the Total Plan
- Invests in strategies that have potential to provide protection against equity market downturns
- Program Benchmark: Custom benchmark based on the actual weights of each strategy component as of the current month end

Innovation Portfolio Allocation

Market Value as of June 30, 2018: $1.89 billion

A $435 million allocation has been made to three risk-based allocation managers. These portfolios of market risk premia are constructed with well-diversified, long-only exposures to three global liquid asset classes: equities, bonds and commodities.

A $1.41 billion allocation has been made to three systematic low volatility strategies which may potentially offer a partial solution to maintaining equity exposure with less risk. These low-cost and scalable equity strategies are designed to help mitigate "tail risk" during adverse market conditions and will be part of the stabilized equity program.

Staff made a total of $250 million in commitments to two private debt investments. As CalSTRS continues to search for yield and diversify away from the growth factor, private debt is a natural fit. In addition to providing regular cash flows, the senior positions in the capital structure combined with conservative loan-to-value ratios should protect investors' capital in periods of economic turmoil.

Top Risk Factor

Risk-based allocation strategies have larger exposure to the real rates risk factor when compared to a standard 60/40 portfolio. This is due to the higher allocation to fixed income to provide a more balanced risk exposure between higher-volatility equities and lower-volatility bonds. Continued rising rates will cause the fixed income portfolio to underperform relative to other asset classes; however, rising rates are usually accompanied by either increased growth or inflation which can benefit the equity and commodity components of the strategy.

Innovation Program Developments

Private Debt:

In Q4 2017, staff received approval from the Innovation Advisory Committee to make a $200 million commitment to a middle-market direct lending strategy investing in both the US and Europe.

In Q1 2018, staff received approval from the Innovation Advisory Committee to make commitments to two European middle-market direct lending strategies for a total of $350 million.

Staff is negotiating terms with these three managers and expects to finalize the legal documents by the end of Q3 2018.

Stabilized Equity (Other Beta):

Staff funded two non-U.S. low volatility managers in Q1 2018 for a total of $660 million. Staff and the global equity team will continue to work together to evaluate these strategies for possible inclusion in the global equity portfolio.

The Innovation Advisory Committee approved the defunding of one US low volatility strategy and two covered call strategies as well as the graduation of the remaining US strategy to Global Equity effective July 1, 2018.

Innovation Portfolio Consultants

General Consultants:

Pension Consulting Alliance and Meketa Investment Group provide guidance to the Teachers' Retirement Board and staff regarding investment strategy, industry best practices and policy matters.

FOR THE PERIOD ENDING JUNE 30, 2018