

CalPERS Trust Level Review & Annual Program Reviews

Investment Committee
September 13, 2021

Investment Program Purpose

- Our Mission

Manage the CalPERS investment portfolio in an efficient and risk aware manner to generate returns to sustainably pay benefits

- Our Vision

Work as one team, with a culture of trust, respect, and accountability to effectively manage one Total Fund

- Key CalPERS 2017-22 Strategic Plan Goal

Strengthen long-term sustainability of the pension fund

Chief Investment Officer (335)

Strategy & Research

Implement

Monitor, Review, & Assess

Board Governance &
Sustainability (BGS)

Research & Strategy Group
(RSG)

Global Equity (GE)

Global Fixed Income (GFI)

Opportunistic Strategies (OS)

Private Equity (PE)

Real Assets (RA)

Trust Level Portfolio Management
& Implementation (TLPMI)

Investment Controls &
Operational Risk (ICOR)

Investment Servicing Division
(ISD)

Investment Risk & Performance
(IRP)

Total Fund Business & Analytical Services (TFBAS)

Our Beliefs & Strategy | Highlights

Our Total Fund investment strategy and processes reflect our Investment Beliefs and Governance & Sustainability Strategy in many ways. For example, we:

- Systematically assess our strategies to ensure alignment with our performance and funded status goals
- Are intentional in where and how we take investment risk
- Manage liquidity at the Total Fund level so we can navigate market disruptions and take advantage of market opportunities
- Understand risk is multi-faceted, and that our investment decision-making processes must consider different risks

Investment Office Strategic Plan Objectives – 4 Ps

Portfolio

- Construct a Total Fund portfolio positioned to generate the required rate of return over the long term, by ensuring effective allocation of risk, leverage and liquidity

Processes

- Institutionalize transparent, disciplined and clear investment decision-making processes to increase organizational effectiveness and support a culture of accountability

People

- Work as one team, with a culture of trust, respect, and accountability to effectively manage one well regarded Total Fund

Performance

- Achieve relative outperformance in service of delivering our long-term projected rate of return

Key Accomplishments | 2020-2021

- Working remotely through the pandemic
- Private asset strategic reviews
- Asset Liability Management (ALM) with Actuarial Office and Financial Office (underway)
- Leverage and liquidity management
- Technology and Data Strategy
- Total Fund governance review

Key Initiatives | 2021-2022

- Conclude ALM (with Actuarial Office and Financial Office)
- Continue deploying private assets at scale
- Continue Technology and Data Strategy
- Continue Total Fund Management

Strategic Objective	Number of Year Two Initiatives
Portfolio	3
Processes	2
People	2

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Trust Level Fund Review

Investment Programs Review

Appendix

Performance – Key Figures (as of June 30, 2021)



8.5%

PERF 10-yr
absolute return



-13 bps

PERF 5-yr
excess return



Returns of Affiliate
Investment Program
funds across all time
periods were in-line with
their respective asset
allocations and reflect
varying risk levels

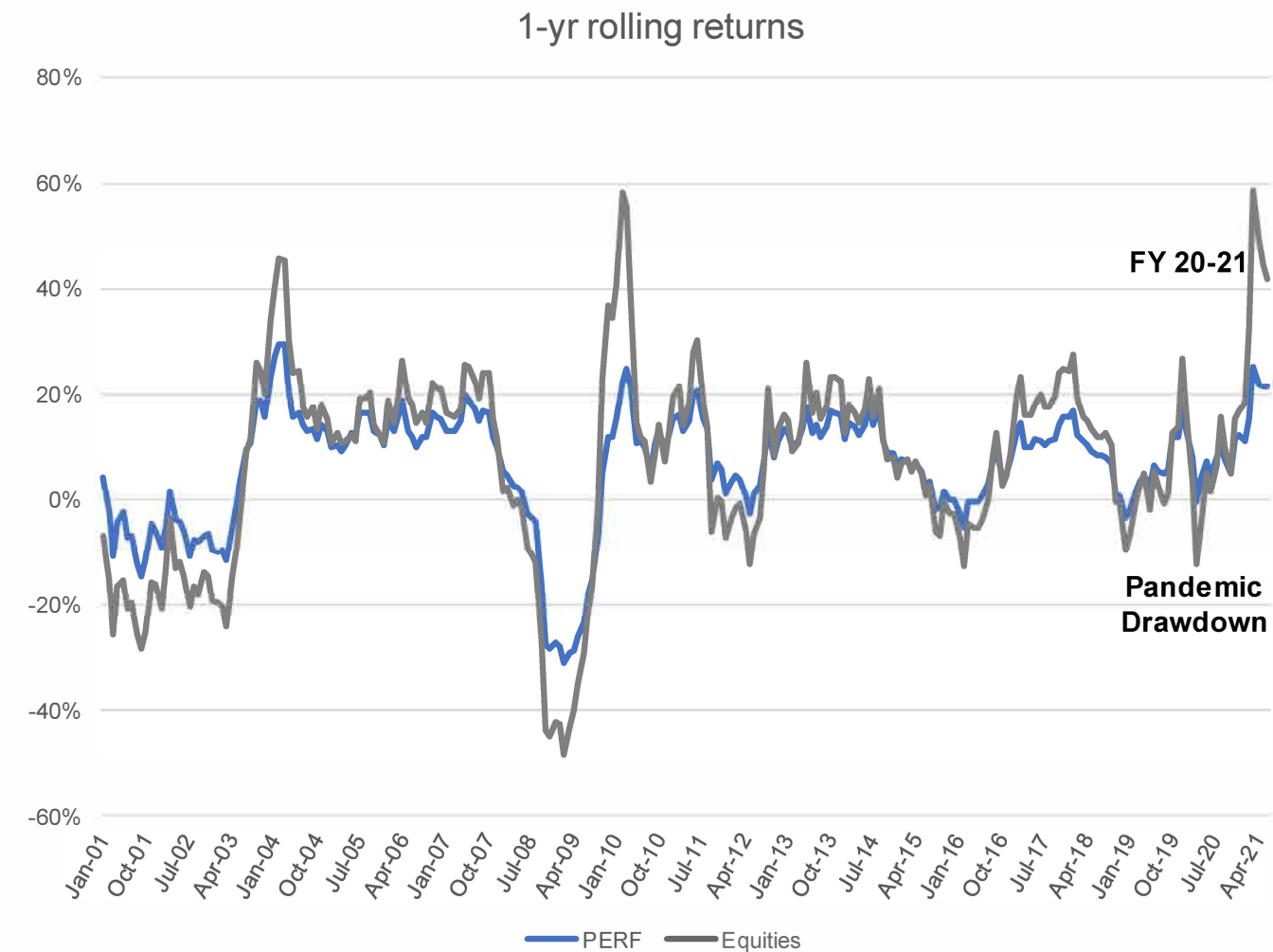
Performance Summary (as of June 30, 2021)

Funds Managed	Ending Asset Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Public Employees' Retirement Fund ¹	470,838	6.9%	(44)	8.5%	0	10.3%	(13)	10.7%	(14)	21.3%	(42)
CalPERS Health Care Bond Fund	518	4.0%	7	3.7%	26	3.1%	2	5.3%	1	-0.4%	(5)
CEPPT Strategy 1	39	-	-	-	-	-	-	-	-	18.2%	15
CEPPT Strategy 2	19	-	-	-	-	-	-	-	-	7.9%	17
CERBT Strategy 1	13,042	-	-	8.4%	27	10.8%	35	11.9%	25	27.5%	18
CERBT Strategy 2	1,815	-	-	-	-	9.0%	32	10.5%	18	19.7%	17
CERBT Strategy 3	819	-	-	-	-	7.1%	27	9.0%	14	13.6%	11
Judges' Retirement Fund	64	1.5%	10	0.7%	6	1.3%	10	1.4%	4	0.1%	4
Judges' Retirement System II Fund	2,395	6.9%	9	8.5%	18	10.3%	35	11.6%	33	24.4%	27
Legislators' Retirement System Fund	122	6.1%	2	6.5%	20	7.2%	27	9.0%	20	13.6%	13
Long-Term Care Fund	5,476	5.3%	12	5.2%	11	6.0%	5	8.2%	5	13.0%	64
Terminated Agency Pool	202	-	-	-	-	4.8%	-	8.1%	-	1.6%	-

Supplemental Income Plan Performance (as of June 30, 2021)

Funds Managed	Ending Asset Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Target Income Fund	120	-	-	5.2%	12	6.4%	14	8.6%	19	12.5%	(6)
Target 2015 Fund	99	-	-	5.5%	3	6.4%	14	8.7%	20	13.5%	(6)
Target 2020 Fund	187	-	-	6.2%	4	7.5%	15	9.8%	23	18.4%	(6)
Target 2025 Fund	227	-	-	7.1%	2	9.0%	16	10.9%	25	23.4%	(7)
Target 2030 Fund	213	-	-	7.8%	(2)	10.1%	7	11.8%	13	28.6%	(8)
Target 2035 Fund	132	-	-	8.5%	(5)	11.4%	8	12.7%	16	34.0%	(8)
Target 2040 Fund	124	-	-	9.2%	(5)	12.6%	5	13.6%	14	38.4%	(9)
Target 2045 Fund	69	-	-	9.4%	(6)	13.2%	5	13.7%	14	38.4%	(9)
Target 2050 Fund	39	-	-	9.4%	(6)	13.2%	5	13.7%	14	38.4%	(9)
Target 2055 Fund	14	-	-	-	-	13.2%	5	13.7%	14	38.4%	(8)
Target 2060 Fund	7	-	-	-	-	-	-	-	-	38.3%	(13)
SSgA STIF	109	-	-	0.7%	9	1.3%	16	1.5%	14	0.1%	4
SIP US ST Bond Core	40	-	-	-	-	1.8%	(9)	2.9%	(6)	0.4%	(9)
SIP US Bond Core	64	-	-	-	-	3.1%	3	5.4%	4	-0.4%	(5)
SIP Real Asset Core	12	-	-	-	-	6.3%	3	7.0%	14	30.9%	(30)
SIP Russell All Cap Core	709	-	-	-	-	17.9%	(2)	18.7%	(1)	44.2%	6
SIP Gbl All Cap EX-US	79	-	-	-	-	11.3%	8	9.7%	24	36.9%	(25)

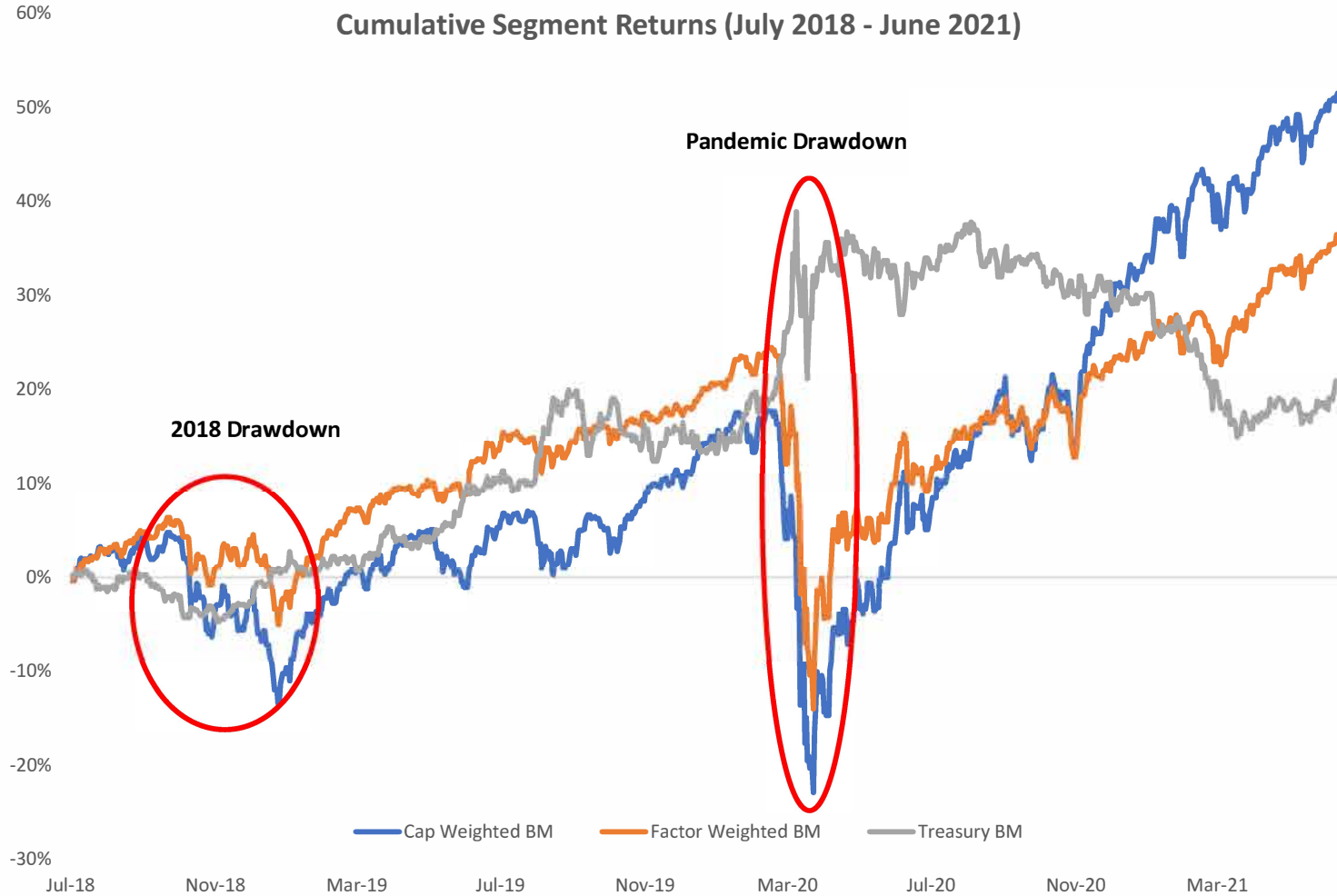
PERF Returns Closely Tied to Equity Markets



Specific Period Return	PERF (A)	Equities (B)	(A/B)
FY 20-21	21.3%	41.6%	0.5
Pandemic Drawdown*	-18.1%	-34.5%	0.5

* 2/13/20 - 3/23/20

Segments Mitigate Drawdown and Offer Diversification



	Cap Weighted BM	Factor Weighted BM	Treasury BM
2018 Drawdown (9/24/18 - 12/24/18)	-17.3%	-10.7%	3.2%
Pandemic Drawdown (2/13/20 - 3/23/20)	-34.5%	-30.6%	11.8%
FY 20-21 (7/1/20-6/30/21)	41.6%	22.6%	-8.7%
Annualized Since Segment Inception (7/1/18-6/30/21)	14.9%	10.6%	6.8%

PERF Risk – Key Figures (as of July 1, 2021)



97%

Contribution to
PERF Volatility
from Assets
Sensitive to
Economic Growth



-3.1%

Current Underweight
to Real Assets vs.
Strategic Asset
Allocation Target



13 bps

Total Fund
Actionable
Tracking Error
(116 bps total TE)



2.7x

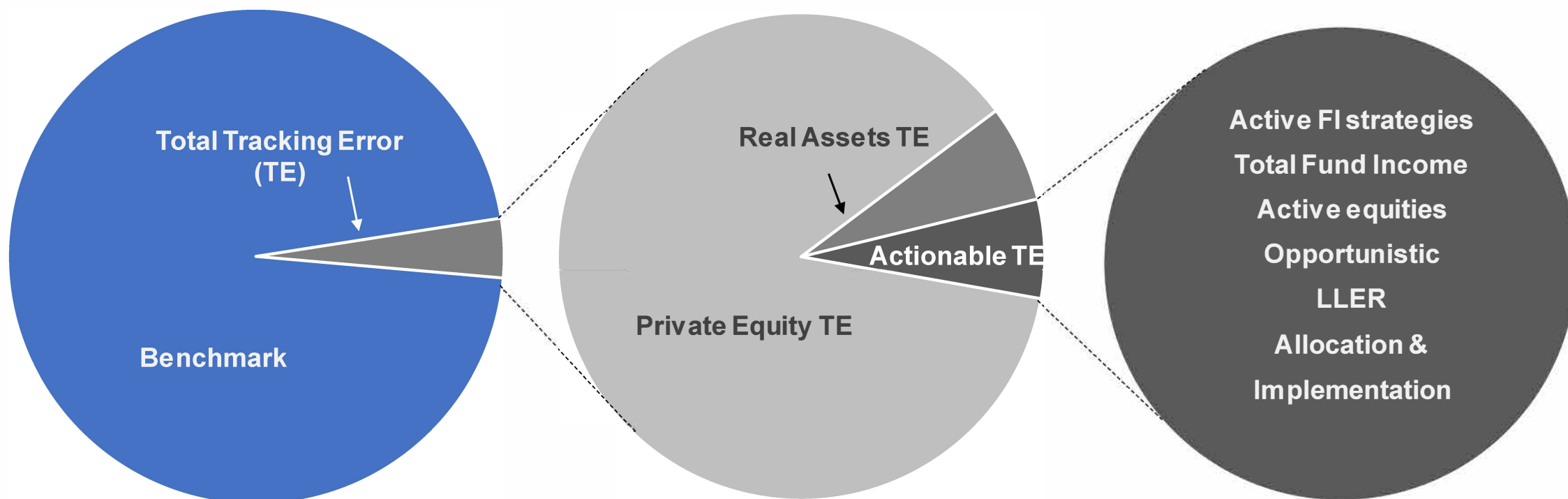
Liquidity
Coverage Ratio
for 30 Day
Stress Scenario

PERF Tracking Error in Total Fund Context (as of July 1, 2021)

Total Volatility = 10.7%

Total Tracking Error = 116 bps

Actionable Tracking Error = 13 bps



Economic Update | Review

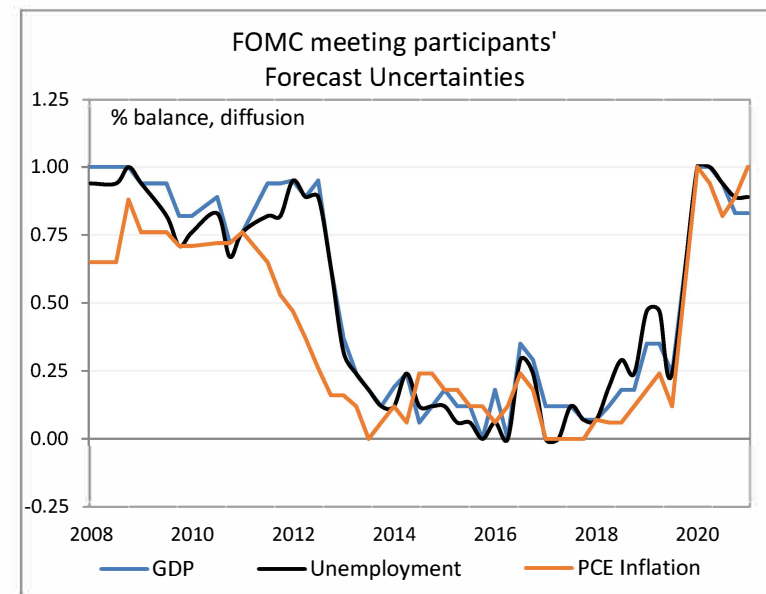
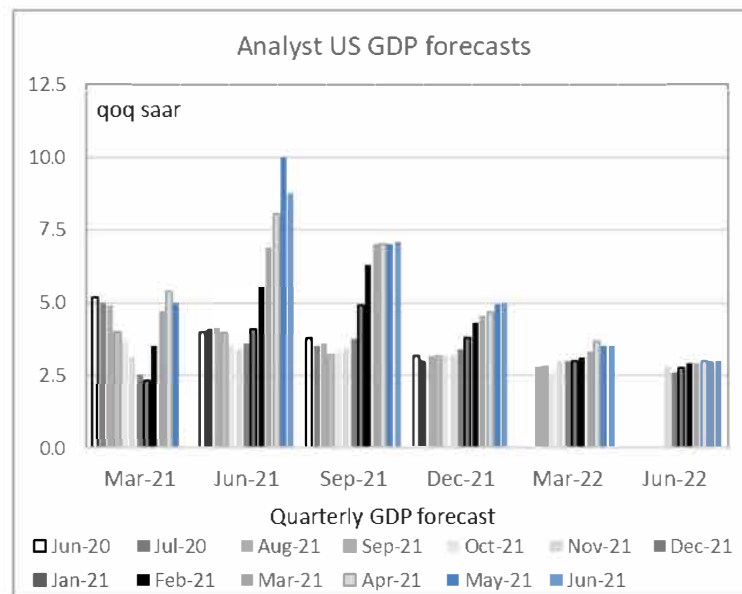
US and global economies outperformed relative to expectations

Expectations for H2 2021 economic growth have improved.

Expectations for US 2022 growth are consolidating around historical averages.

Uncertainty over future outcomes remains elevated.

The dispersion of global macroeconomic outcomes still high.



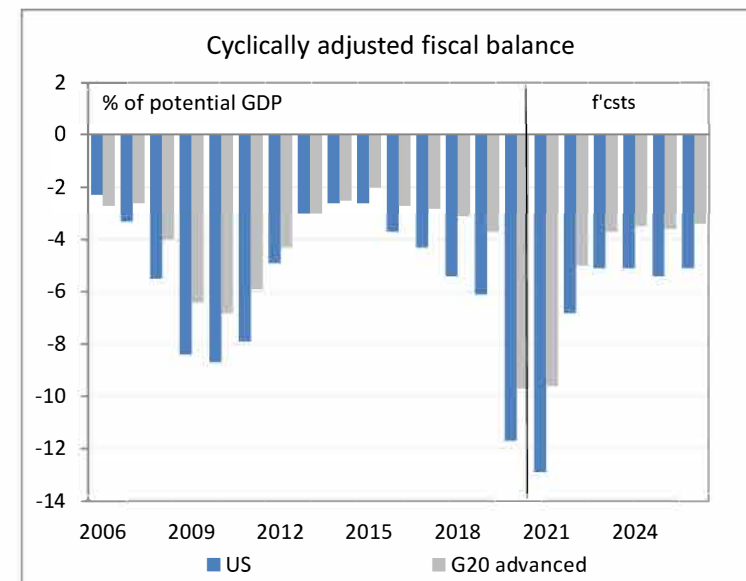
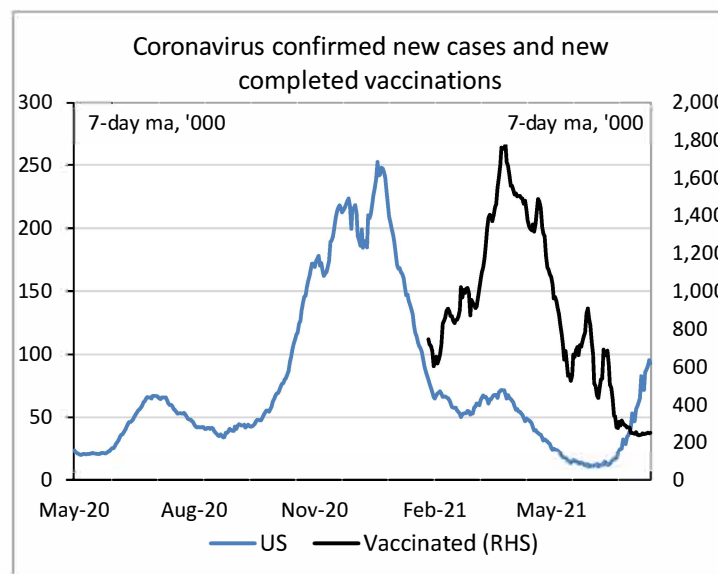
Economic Update | Future outlook

Delicate balancing act

Key drivers of recovery: labor market; supply-chain disruptions, rate of virus infections in the Fall.

COVID-19 Delta variant increases uncertainty over trajectory.

Monetary and fiscal policy marginal support is waning.



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Investment Programs Review

Public Assets

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Global Equity | Implementation Highlights

Global Equity is the principal asset class providing growth exposure in the strategic asset allocation

- Global Equity Team participates in global capital markets and provides perspective to support strategic asset allocation and Total Fund decisions
- Total AUM: \$242 Billion (71% cap-weighted, 29% factor-weighted)

Program thoughtfully delivers multiple equity betas with low active risk and an efficient cost structure

- 96% of the portfolio is invested in cost-efficient, internally-managed strategies

Companies only offering non-voting shares have been removed from the Global Equity Benchmark to improve shareowner rights

A narrowed Global Policy Benchmark has been implemented for the cap-weighted segment to more effectively extract the equity risk premium

Global Equity Performance (as of June 30, 2021)

	Ending Asset Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Public Equity	242,215	7.4	(11)	10.1	10	14.2	(5)	13.3	12	36.3	31
Cap Weighted	171,735	7.6	(11)	10.5	10	15.2	(5)	15.0	12	42.0	46
Index Oriented	161,646	7.7	18	10.8	17	15.6	17	15.2	18	41.9	27
Active	7,978	8.3	38	10.0	108	16.0	165	17.3	327	46.5	590
Alternative Beta	1,453	-	-	9.5	(31)	14.0	(114)	13.5	(131)	40.7	(83)
Emerging Manager	609	6.2	(154)	7.3	(223)	8.6	(387)	4.4	(538)	33.7	(509)
Allocation Mgmt./Completion	49	-	-	-	-	-	-	-	-	N/M	-
Factor Weighted	70,480	-	-	-	-	-	-	10.7	3	22.6	(2)

- Current fiscal year excess return driven by Active strategies
- Index Oriented was a funding source for Low Liquidity Enhanced Return (LLER) assets during first half of the year and those assets contributed +20 bps to the Index Oriented strategy
- Alternative Beta and the Emerging Manager Program underperformed their respective benchmarks

Global Equity | Priority Accomplishments

Major Accomplishments for 2020-2021

- Removed companies only offering non-voting shares from the benchmark to improve shareowner rights
- Adopted and implemented a narrowed Policy Benchmark to improve extraction of the equity risk premium and reduce operational complexity
- Progressed implementation of the Total Fund Governance & Sustainability Strategic Plan (Executive Compensation, Board Diversity, and Climate Action 100+)
- Completed evaluation of Multi-Asset Trading Platforms and began planning for implementation of outcomes

Global Equity | Priority Initiatives

Major Initiatives for 2021-2022

- Collaborate with Investment Services and Investment Risk & Performance to support INVO Technology & Data Business Plan Initiative (INVO Technology Strategy, INVO Data Strategy & Investment Performance Platform)
- Continue to contribute to the development and implementation of the multi-year Total Fund Governance & Sustainability Strategic Plan
- Carry out Global Equity Portfolio Construction Reimplementation to optimize workflows and adapt to core Charles River platform functionality as directed by the INVO Business Plan
- Collaborate with TLPPI in preparation for the ALM outcomes for Global Equity

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Global Fixed Income | Implementation Highlights

Global Fixed Income utilizes an internal allocation and investment review process to optimize allocation and control risk:

- Weekly Portfolio Allocation Committee (PAC)
 - Bi-monthly we include the entire GFI team to discuss implementation of investment management decisions, allocation among Spread sectors, information sharing, and testing of investment ideas
 - Incorporation of alternative measures of risk and potential return including risk premia analysis, correlation analysis, and alternative risk “bucketing”
- Collaboration with the RSG Economic and Quant teams has contributed to strong investment returns
- Daily and weekly reports highlight current allocations by weight, risk and return

Global Fixed Income Performance (as of June 30, 2021)

	Ending Asset Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Income	140,412	6.4	61	5.1	57	4.4	55	7.2	39	(0.1)	64
Spread	70,915	-	-	-	-	-	-	7.1	70	3.2	61
Mortgage	33,985	-	-	3.7	98	2.9	52	4.2	24	0.1	26
Credit Ex Sov	28,751	-	-	7.7	78	7.2	94	10.8	76	4.7	26
High Yield	3,784	-	-	7.1	84	7.9	82	7.2	53	16.8	128
Sovereign	3,642	-	-	6.0	50	5.2	64	9.0	64	2.1	31
Spread Non-Core	720	-	-	-	-	-	-	21.0	-	63.4	-
Allocation Mgmt./Completion	31	-	-	-	-	-	-	N/M	-	N/M	-
Treasury	48,276	-	-	-	-	-	-	6.6	(14)	(8.5)	13
High Yield	14,150	-	-	-	-	-	-	6.8	14	13.7	28
Total Fund Income	7,071	-	-	-	-	-	-	-	-	-	-
Liquidity	4,831	1.8	6	1.2	(5)	1.3	30	1.4	28	0.1	6
Inflation	0	-	-	-	-	-	-	-	-	-	-

- All Income segments produced positive excess returns for the year
- All Spread strategies positively contributed to excess returns
- Treasury was a funding source for LLER assets during first half of the fiscal year and those assets contributed +20 bps to the Treasury strategy
- Total Fund Income, benchmarked against treasuries, was funded in September 2020 and can invest in credit when spreads widen

Global Fixed Income | Priority Accomplishments

Major Accomplishments for 2020-2021

- Total Fund Focus
 - Contributed to the ALM Process including the research and analysis of potential fixed income alternatives
 - Created and managed a Total Fund Fixed Income Portfolio that added 8 basis points of relative return to the Total Fund
 - Created and managed a Synthetic Treasury portfolio to provide Total Fund Leverage and Allocation Rebalance Liquidity
 - Participated in the Evaluation and Selection of a Multi Asset Trading Platform to enhance Total Fund risk management
- Asset Class Collaboration
 - Assisted Private Equity and Real Assets in the research and analysis of investment opportunities
 - Collaborated with RSG on investment and economic research and analysis
- Performance
 - Strong relative performance during tough pandemic influenced financial markets

Global Fixed Income | Priority Initiatives

Major Initiatives for 2021-2022

- Continue to Support INVO's Total Fund Focus
 - Support TLPPI in the ALM process and evaluate the proper implementation of any new fixed income asset classes
 - Support Private Equity, Opportunistic Strategies, Real Assets and the Research and Strategy Group in analyzing potential new investment opportunities
 - Support RSG's global research effort (China, Emerging Markets research, etc.)

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Opportunistic Strategies | Implementation Highlights

Successes

- Opportunistic: Successfully committed over \$10 Billion to Private Debt program, with over \$1.9 Billion deployed
- LLER: Outperformed benchmark by 395 bps

Challenges

- Opportunistic: Deployment into Private Debt is a slower process than purchasing public market securities, thorough diligence and analysis is essential
- LLER: Need to recruit talent to oversee increased deployment of assets (portfolio has been in run-off mode since August 2019)

Opportunistic Strategies Performance (as of June 30, 2021)

	Ending Asset Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Low Liquidity Enhanced Return (LLER)	9,542	-	-	-	-	3.0	214	2.8	190	4.0	395
Opportunistic	2,095	-	-	-	-	-	-	-	-	13.1	609
Private Debt ¹	1,849	-	-	-	-	-	-	-	-	9.3	234
Public Market Dislocation ¹	246	-	-	-	-	-	-	-	-	23.2	1619

- The market value and impact from LLER investments was included in the Public Equity – Cap Weighted and Treasury segments through December 2020
- Funded 11 Private Debt investments in FY 2020-21

Opportunistic Strategies | Priority Accomplishments

Major Accomplishments for 2020-2021

- Successfully committed \$10 Billion to Private Debt area, with \$1.9 Billion deployed
- Made progress in building out team and executing on private debt strategies
- Further developed and implemented governance processes, documents, and procedures for the management and monitoring of the Private Debt strategy

Opportunistic Strategies | Priority Initiatives

Major Initiatives for 2021-2022

- Attract and retain talent necessary to complete OS resourcing strategy and enhance Private Debt management and monitoring capabilities
- Improve portfolio monitoring and risk oversight tools and practices, including exploration of extending the use of efront to Opportunistic Strategies
- Continue to deploy capital to Private Debt to ensure a robust and well diversified portfolio
- Support TLMPI program in the ALM process and actively engage in implementation to deliver added value to the Total Fund

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Private Equity | Implementation Highlights

- Expanded our partnerships with high quality managers
- Disciplined expansion of capital deployment while increasing portfolio cost efficiency and diversification
- Completed strategic planning process framing portfolio objective and strategic priorities

Private Equity Performance (Time Weighted Returns as of June 30, 2021¹)

Performance by Strategies

	Ending Market Value (MM)	20-Yr Net Return	10-Yr Net Return	5-Yr Net Return	3-Yr Net Return	1-Yr Net Return
Private Equity	38,855	10.1	12.0	14.2	13.7	43.8
Buyouts	28,020	13.7	12.9	15.2	13.8	45.4
Credit	2,177	10.0	6.7	5.8	4.2	33.0
Growth/Expansion	6,083	7.7	13.1	17.7	16.4	46.9
Opportunistic	1,990	8.0	11.8	13.3	15.9	37.4
Venture	441	3.3	8.4	9.6	18.2	27.0
Other	144					

Performance vs. Benchmarks

	20-Yr Net Return	10-Yr Net Return	5-Yr Net Return	3-Yr Net Return	1-Yr Net Return
Private Equity	10.1	12.0	14.2	13.7	43.8
Policy Benchmark	10.80	13.40	16.30	14.30	61.10
Excess bps	(70)	(140)	(210)	(60)	(1730)
Public Equity - Cap Weighted Benchmark + 150 bps, lagged	9.20	11.40	15.60	14.30	61.10
Excess bps	90	60	(140)	(60)	(1730)

- Over the past year, performance has improved on an absolute basis across all time periods, while materially underperforming relative to benchmark

Private Equity Performance (Money Weighted Returns as of March 31, 2021¹)

Program Performance vs. Peer Universe Benchmarks

	20-Yr Net Return	10-Yr Net Return	5-Yr Net Return	3-Yr Net Return	1-Yr Net Return
Private Equity - Internal Rate of Return	10.1	11.2	14.1	13.6	45.5
Cambridge Private Equity Index ²	11.9	14.4	18.6	20.9	54.2
Excess bps	(180)	(320)	(450)	(730)	(870)
State Street Private Equity Index		14.0	18.0	19.7	53.6
Excess bps		(280)	(390)	(610)	(810)

- Peer universe benchmarks are calculated using money weighted returns and serve an additional means of evaluating the Private Equity Program
- The Private Equity Program has underperformed relative to published industry benchmarks, with further deterioration over the past year:
 - The drivers of underperformance are understood and reversible over time. They include a lack of: consistent capital commitments, strategic consistency, cost efficiency and diversification
 - The drivers of underperformance will be addressed through: disciplined multi-year capital commitment pacing, expansion of the co-investment program, and broader exposure to high-conviction managers and companies across market segments
 - The turnaround of the PE Program will require time. Consistent execution through market cycles is key

Private Equity | Priority Accomplishments

Major Accomplishments for 2020-2021

- Continued to build a more effective and collaborative team culture
- Expanded team capabilities through new additions and new skill set development
- Completed strategic planning process
- Introduced organizational alignment around market segments to increase staff specialization and expertise
- Ramped co-investment program
- Initiated process to formulate PE-specific sustainability strategy

Private Equity | Priority Initiatives

Major Initiatives for 2021-2022

- Methodical execution of our strategy: consistency, cost-efficiency, and diversification
- Nurture our core: deep partnerships with high-quality managers
- Continued expansion of team skill set
- Complete PE sustainability strategy
- Assess alternatives for streamlining portfolio
- Deeper integration of data into our business processes
- Collaborate with TLMPI in the ALM process for Private Equity

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Real Assets | Implementation Highlights

Strengths

- Program comprised of high-quality, essential core assets in defined target markets with stable cash flows held through business cycles
- Prioritized business model is separate accounts with strong governance, alignment, and transparency managed by specialists with proven execution capabilities
- Unified team collaborating with Total Fund to implement repeatable, scalable business model within a disciplined governance framework

Challenges

- Increased institutional allocations into private assets have made acquisitions more competitive
- COVID-19 still impacting select Real Estate and Infrastructure sectors

Real Assets Performance (as of June 30, 2021)

	Ending Market Value (MM)	20-Yr		10-Yr		5-Yr		3-Yr		1-Yr	
		Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps	Net Return	Excess bps
Real Assets	45,254	5.5	(260)	8.1	10	5.2	16	3.6	(26)	2.6	128
Real Estate	38,305	5.2	(332)	8.7	4	5.0	(19)	3.6	(30)	1.9	62
Infrastructure	6,119	-	-	10.6	551	9.6	469	6.0	217	7.2	589
Forestland	829	-	-	(2.0)	(723)	(1.4)	(523)	(3.3)	(716)	1.4	12

- Program provided stable annualized net income return of approximately 3.0% for the 1, 3, and 5-Yr periods
- Infrastructure is the primary contributor to Real Assets excess return across all periods
- Core Real Estate outperformed benchmark over the 3, 5 and 10-yr periods
- Real Estate 1-yr performance driven by Industrial sector

Real Assets | Priority Accomplishments

Major Accomplishments for 2020-2021

- Developed the 2021 Real Assets Five Year Strategic Plan
- Further aligned portfolio with role, strengthened Core portfolio positioning and reduced exposures not aligned with the role of Real Assets
- Continued to refine the manager alignment model to provide greater transparency, control and cost efficiency
- Enhanced collaboration across Total Fund program areas to improve decision-making
- Completed detailed asset level real estate attribution analysis project

Real Assets | Priority Initiatives

Major Initiatives for 2021-2022

- Implement the 2021 Five Year Strategic Plan
 - Deploy capital at scale while maintaining high underwriting standards
 - Expand Infrastructure business model to accelerate deployment
 - Explore additional Real Estate target markets & sub-sectors
- Further integrate data into our business and decision-making processes
- Continue focus on Sustainable Investment initiatives consistent with Total Fund priorities
- Collaborate with TLMPI in the ALM process for Real Assets

Conclusion

- Recap & Next Steps
- Questions

Appendix

Additional Information

Trust Level

Global Equity

Global Fixed Income

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Private Equity

Real Assets

Appendix

Additional Information

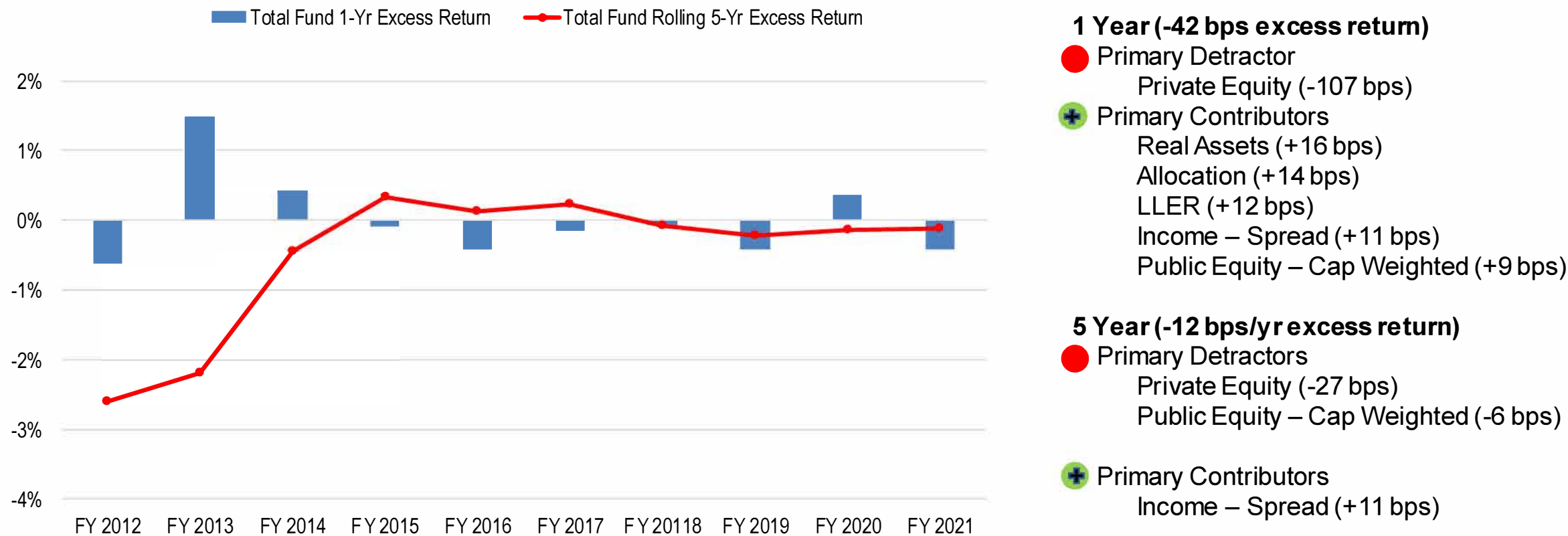
Trust Level

Additional Trust Level Risk & Performance

Investment Beliefs

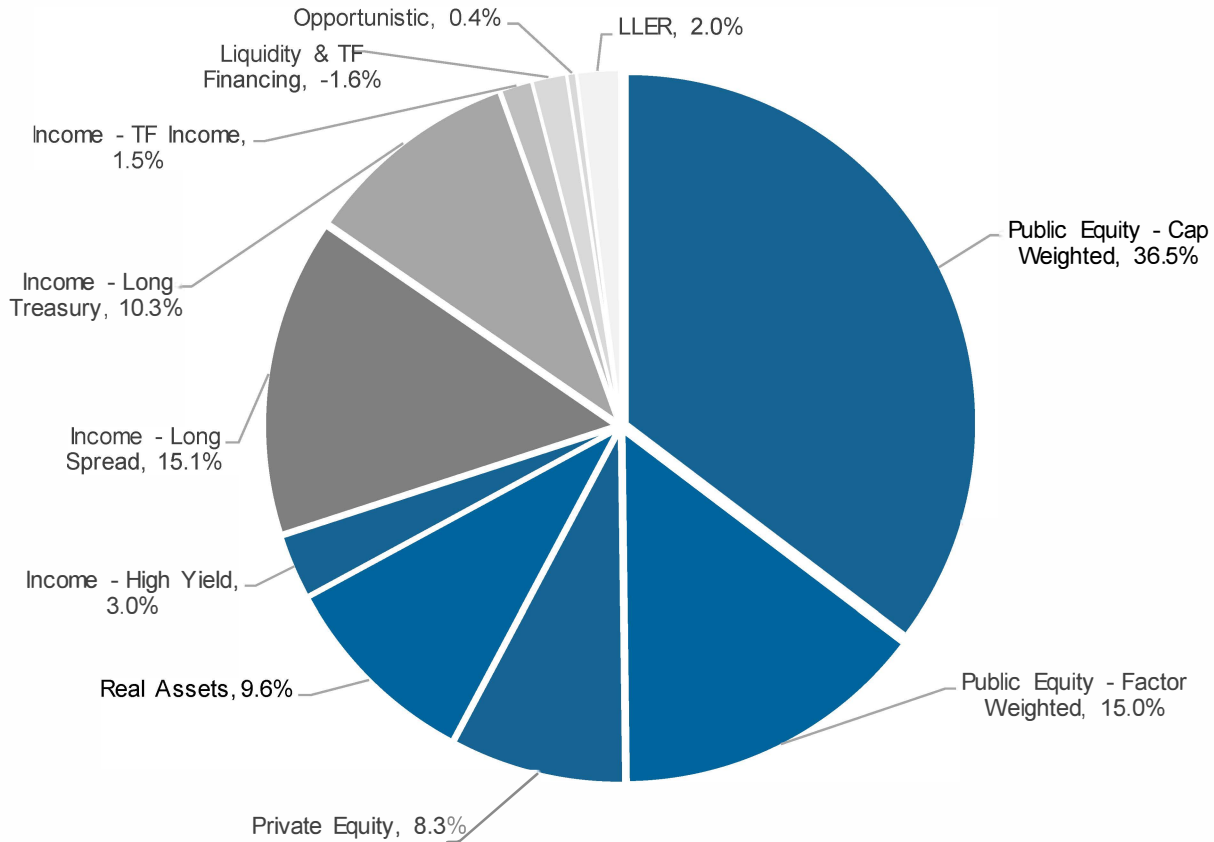
Additional Teams Overview

PERF Excess Returns | Rolling 5-Year (as of June 30, 2021)

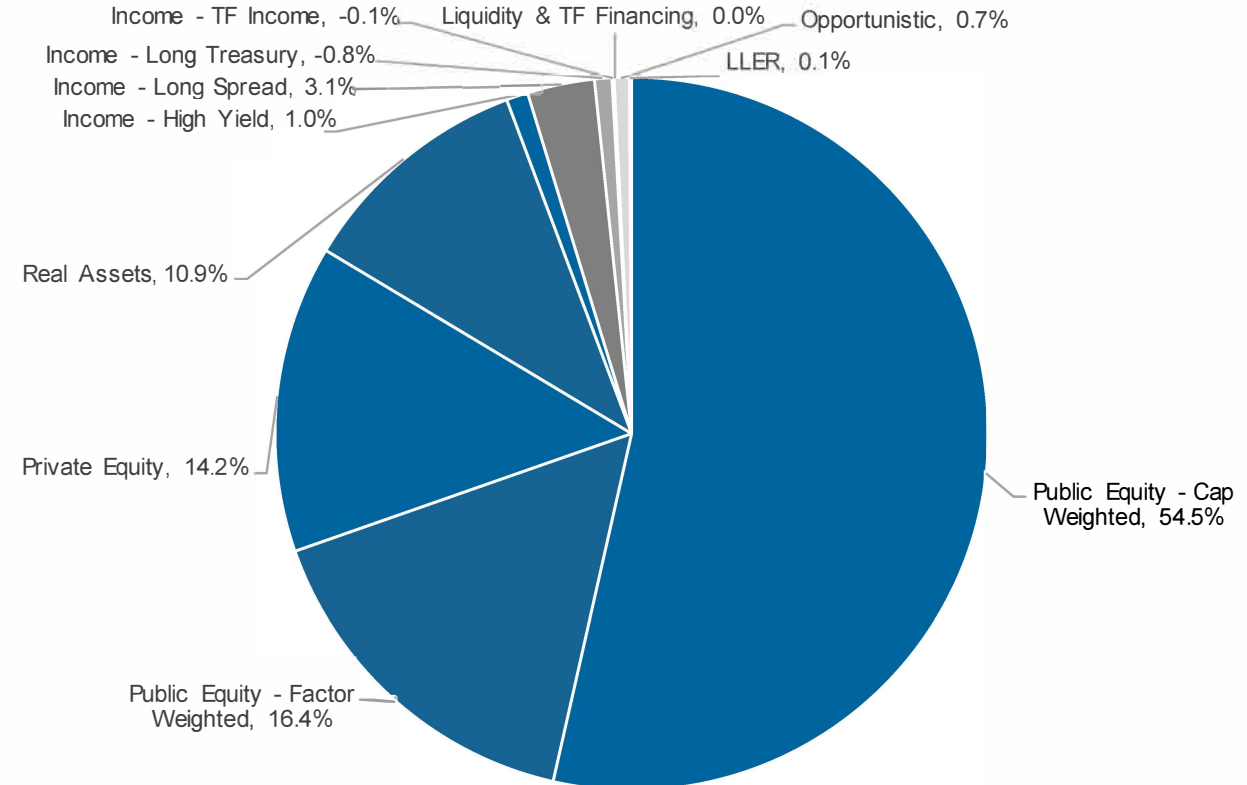


Assets Sensitive to Economic Growth Dominate Risk

Asset Allocation (as of 7/1/2021)



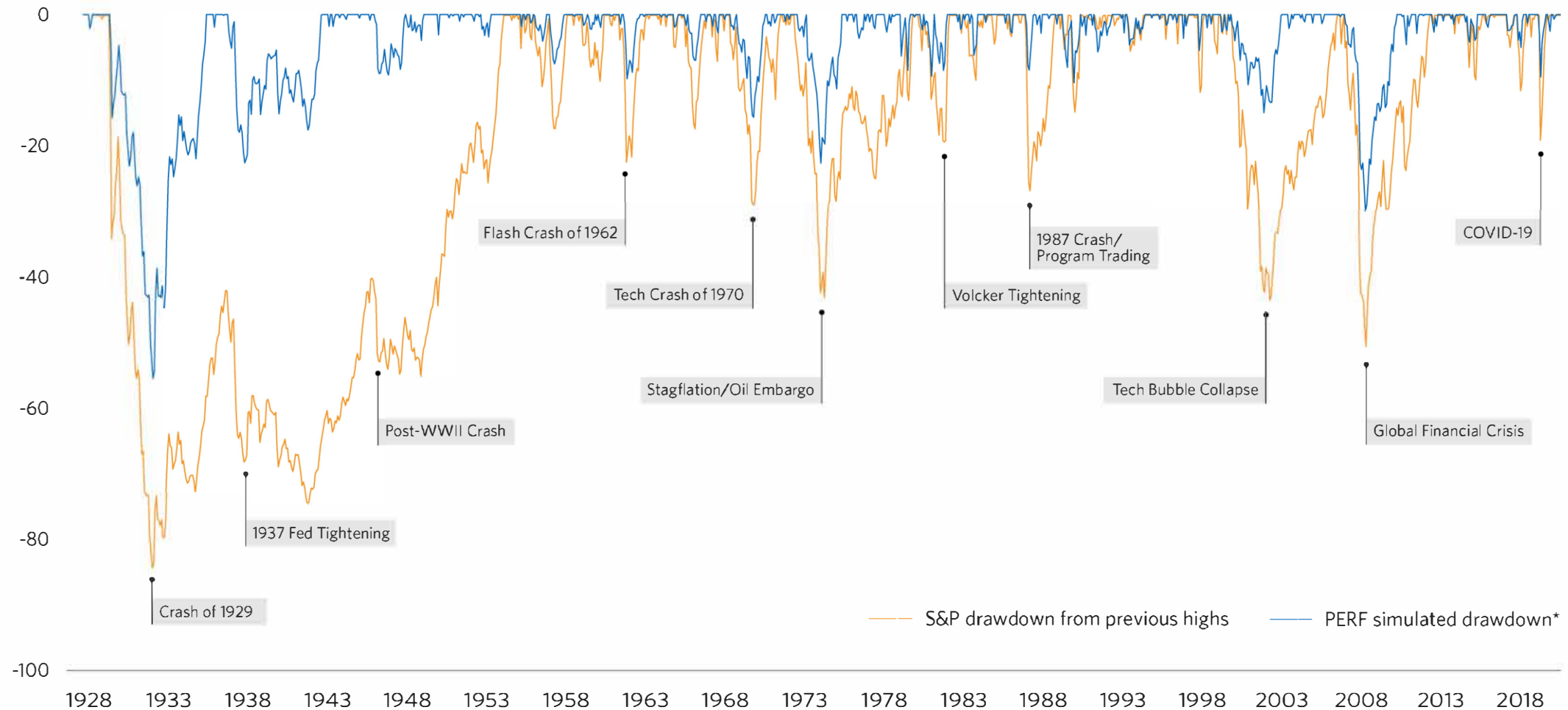
Risk Contribution by Asset Class (as of 7/1/2021)



Equity Markets Drive PERF Drawdowns

Simulated Monthly Performance of PERF Strategic Asset Allocation*

* Simulated performance of PERF asset allocation rebalanced quarterly to the current policy targets assuming historical returns for current benchmarks. For historical periods when performance data is not available for some asset classes risk comparable proxies are used.



CalPERS Investment Beliefs Summary

[CalPERS' Investment Beliefs](#) are not a checklist to be applied to every decision. They are a guide for making decisions that often require balancing multiple inter-related decision factors. Each Investment Belief also contains several sub-beliefs that are actionable statements that provide insight as to how the Investment Beliefs will be implemented.

1. Liabilities must influence the asset structure
2. A long time investment horizon is a responsibility and an advantage
3. CalPERS investment decisions may reflect wider stakeholder views, provided they are consistent with its fiduciary duty to members and beneficiaries
4. Long-term value creation requires effective management of three forms of capital: financial, physical, and human
5. CalPERS must articulate its investment goals and performance measures and ensure clear accountability for their execution
6. Strategic allocation is the dominant determinant of portfolio risk and return
7. CalPERS will take risk only where we have a strong belief we will be rewarded for it
8. Costs matter and need to be effectively managed
9. Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error
10. Strong processes and teamwork and deep resources are needed to achieve CalPERS goals and objectives

Integration of Investment Beliefs | Example Highlights

Investment Beliefs

Investment Belief 1

Liabilities must influence the asset structure.

- Use of asset segments supports Portfolio Priorities (protect the funded ratio, stabilize employer contribution rates, achieve long-term required rate of return)

Investment Belief 2

A long time investment horizon is a responsibility and an advantage

- Investment processes are built on a strong liquidity management framework that provides adequate liquidity and allows us to harvest an illiquidity premium. Due to our long-term nature we are able to endure temporary market volatility

Investment Belief 3

CalPERS investment decisions may reflect wider stakeholder views, provided they are consistent with its fiduciary duty to members and beneficiaries

- CalPERS work on engagement, advocacy and integration of climate change risks and opportunities is rooted in partnerships

Investment Belief 4

Long-term value creation requires effective management of three forms of capital: financial, physical and human

- Integration of environmental, social, and governance factors into the investment management process contribute to the long-term sustainability of the fund.

Investment Belief 5

CalPERS must articulate its investment goals and performance measures and ensure clear accountability for their execution

- We routinely report on our investment performance and on our funding levels and risks

Investment Belief 6

Strategic allocation is the dominant determinant of portfolio risk and return

- We consider investment strategies that have the potential for material impacts to the Total Fund

Investment Belief 7

CalPERS will take risk only where we have a strong belief we will be rewarded for it

- We conduct systematic reviews of our investment strategies and take action to reduce active risks. For example, the Global Equity program restructured its Traditional Active, Alternative Beta, and Emerging Manager portfolios

Investment Belief 8

Costs matter and need to be effectively managed

- The majority of our public assets are invested in cost-efficient, internally managed and implemented strategies

Investment Belief 9

Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error

- We consider risk factors that emerge slowly but that can materially impact our portfolio, such as the effects of climate change on real assets investments

Investment Belief 10

Strong processes and teamwork and deep resources are needed to achieve CalPERS goals and objectives

- We emphasize the importance of an inclusive and collaborative 'One Team, One Fund' culture that recognizes our team members are assets in achieving our objectives

Additional Information | INVO Teams

The following slides provide a high-level introduction of the other eight teams that are integral to CalPERS' investment program

Board Governance & Sustainability

- Advise on board governance and lead on strategic initiatives across the total fund such as human capital management, including the Responsible Contractor program, financial markets advocacy, external partnerships, such as Climate Action 100+ and the Total Fund Governance & Sustainability Strategic Plan

Total Fund Management (previously Research & Strategy Group and Trust Level Portfolio Management & Implementation)

- Provide economic and quantitative analysis to support the investment-decision making process at both a Total Fund and asset class level and support the Investment Management Committee's management of the active portfolio. Manage the ALM and strategic asset allocation processes, Affiliate Funds, and provide centralized trading and liquidity management services.

Additional Information | INVO Teams Continued

Investment Servicing Division

- Responsible for trade support and investment operations, management of investment-related IT, internal financial services, and strategic/business planning

Investment Controls & Operational Risk

- Responsible for trade controls, policy testing, benchmark and policy governance activities, Operational Due Diligence, and overall support for the operational risk control environment of the Investment Office

Investment Risk & Performance

- Create transparency on CalPERS' portfolios and investment processes to ensure that investment risks are intended, understood, and compensated

Additional Information | INVO Teams Continued

Private Asset Analytics

- At the direction of the Deputy Chief Investment Officer, lead and provide expertise for Strategic Initiatives and Special Projects across INVO bringing specialized experience in Private Market Assets

Total Fund Business & Analytical Services

- Deliver high-quality business, analytical and administrative support services to Investment Office asset class and program customers through a centralized operating model

Appendix

Additional Information

Trust Level

Global Equity

Global Fixed Income

Opportunistic Strategies

Private Equity

Real Assets

Global Equity | Role in the Total Fund

Percentage of PERF

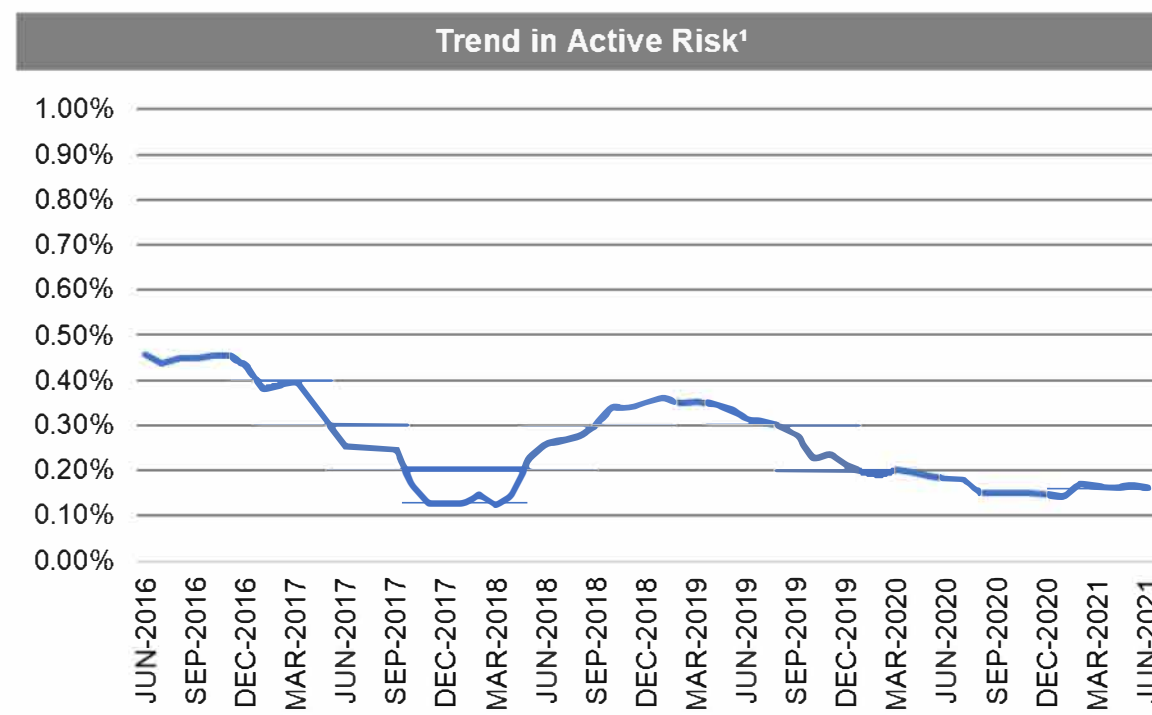
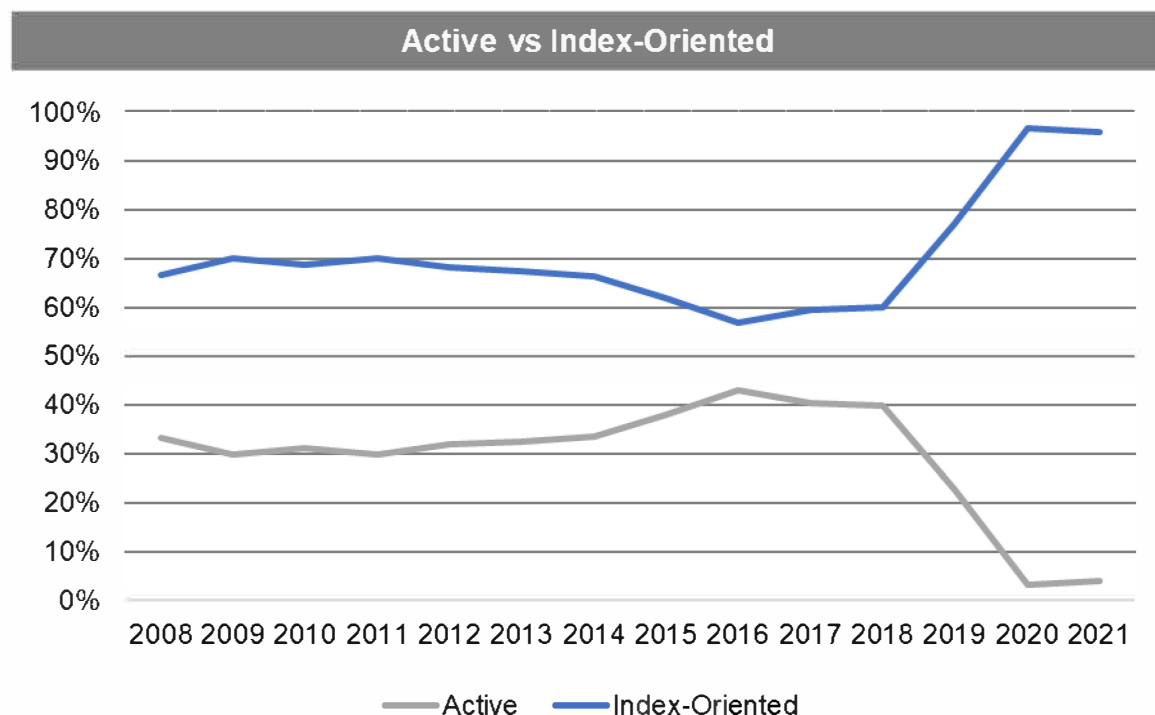
	Target	<u>Actual (as of 6/30/2021)</u>
Total Public Equity	50% (+/- 7%)	51.4%
Cap Weighted	35%	36.5%
Factor Weighted	15%	15.0%

Total Fund Role

- Total return oriented and to capture the equity risk premium (ERP), defined as the excess return over risk-free government bonds, by means of ownership risk in companies and exposure to corporate earnings growth.
- Drivers of total performance
 - Price appreciation
 - Cash yield
- Risks
 - Economic: High sensitivity to global economic growth variability
 - Liquidity: Portfolio expected to remain highly liquid

Global Equity | Characteristics & Positioning

- Index-oriented portfolio implementation has remained stable since the prior year
 - As of 6/30/2021, 96% of assets are categorized as index-oriented
 - Global Equity active risk has continued to trend downward



Global Equity | Characteristics & Positioning

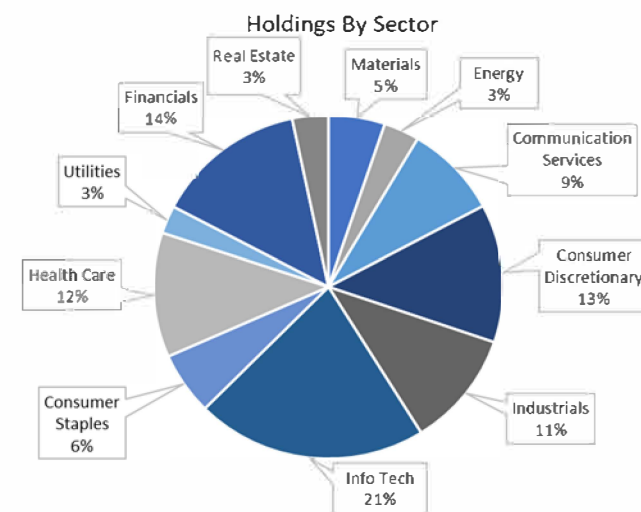
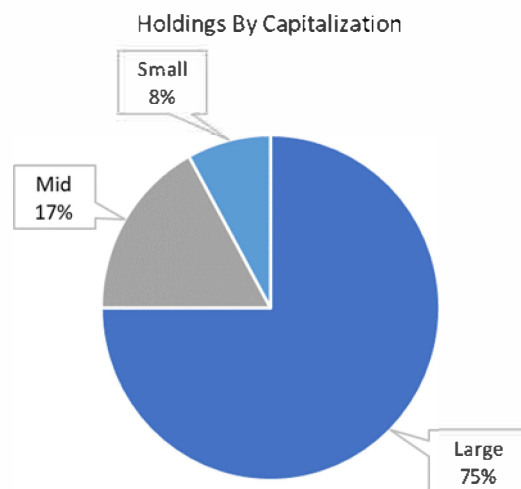
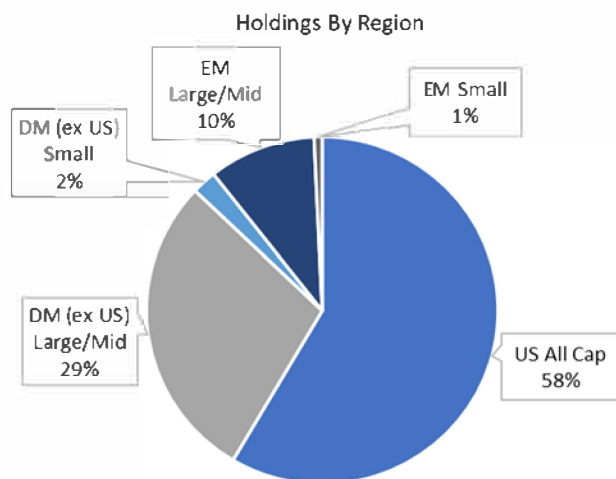
- CalPERS Custom FTSE Global Benchmark

- Adopted a narrowed Policy Benchmark to improve extraction of the equity risk premium through simplification. The CalPERS Custom FTSE Global Benchmark harvests the top 95% of total global investable market capitalization, in addition to removing companies only offering non-voting shares¹. The narrowed implementation and non-voting share screen seeks to:

- 1.) Reduce operational complexity, while maintaining an attractive risk/return profile
- 2.) Improve shareowner rights

Narrowed Benchmark Characteristics (as of 7/01/2021)

- CalPERS customization excludes tobacco, firearms, thermal coal, Iran/Sudan, ESG risk, and non-voting shares
- Holds: 5,491 constituents, weighted by market capitalization
- Covers: 34 countries, 28 currencies



Global Equity | Integration of Governance & Sustainability Examples

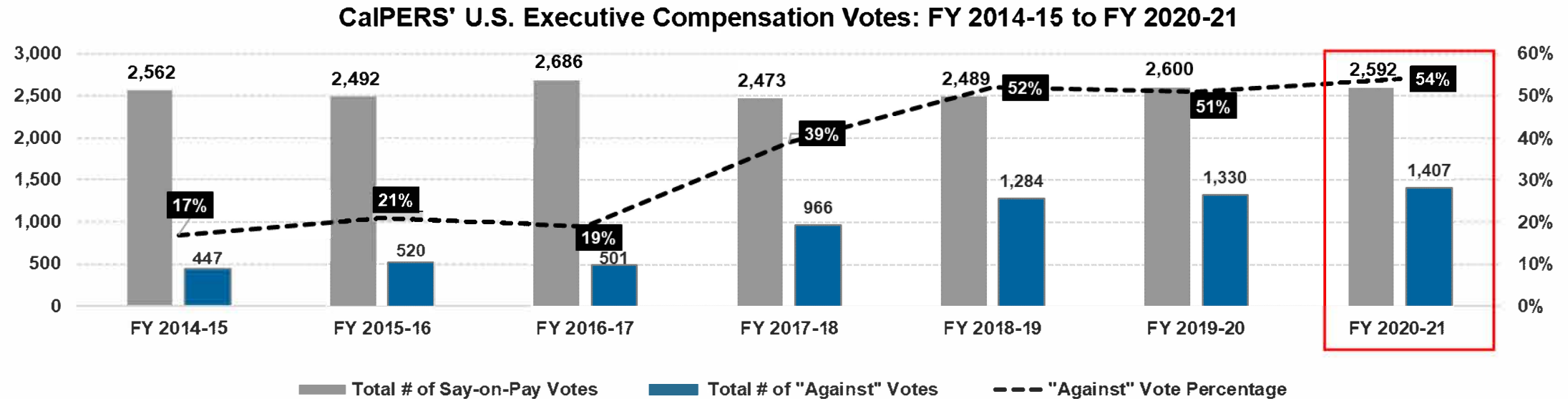
Global Equity integrates CalPERS Governance & Sustainability Strategy in various ways, which include but are not limited to:

- Proxy Voting
 - Votes all public company proxies in a manner consistent with CalPERS' Governance & Sustainability Principles and CalPERS' Investment Beliefs
- Engagement
 - Actively engages portfolio companies on executive and employee compensation, corporate board diversity, climate change, human capital management, and other Governance & Sustainability considerations to promote long-term value creation
- Partnerships
 - Leverages external and internal partnerships to actively engage global asset owners and managers, companies, data providers, regulators, and standards-setting bodies on material Governance & Sustainability factors
- Research
 - Continuous research, development and integration of best practices, proxy voting enhancements, and evolution of Governance & Sustainability

Governance & Sustainability | Proxy Voting and Engagement Update

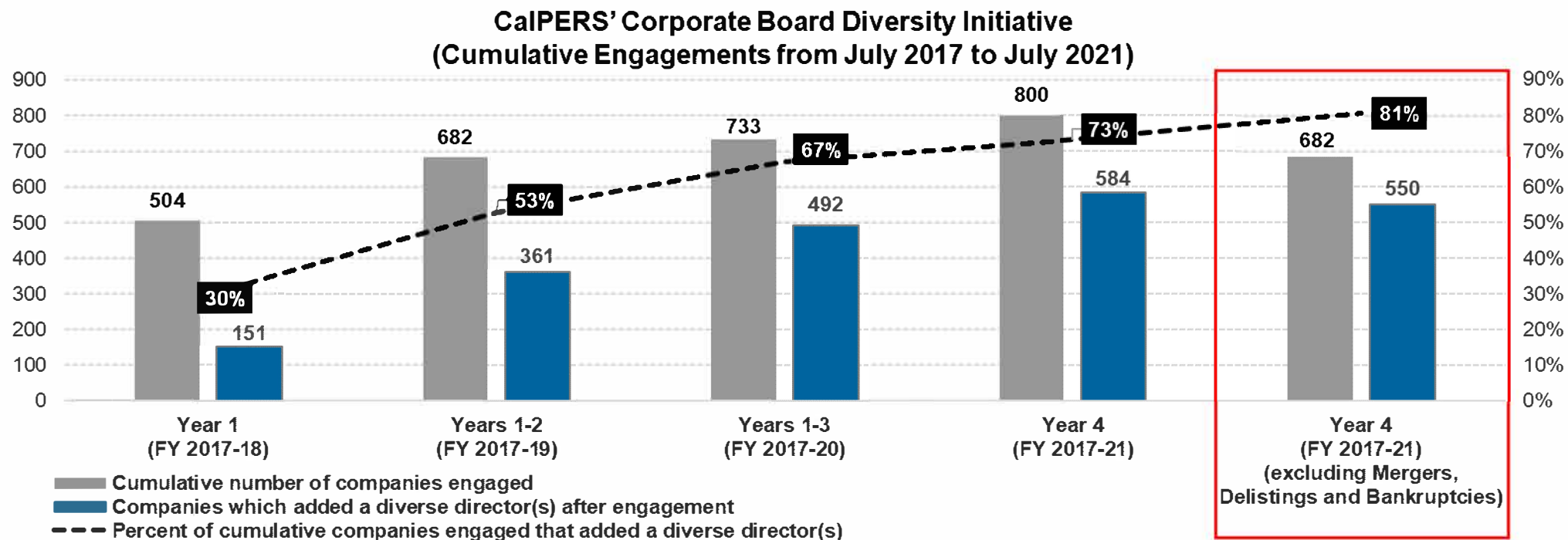
- **Enhanced executive compensation analysis and accountability**
 - Voted “against” 54% of executive compensation proposals for poor pay-for-performance alignment (by comparison voted “against” 51% in FY19-20 and “against” 52% in FY18-19)
 - Voted “against” 3,896 Compensation Committee members, holding them accountable for poor pay-for-performance alignment and poor compensation practices (by comparison voted “against” 3,159 directors in FY19-20)
- **Improved corporate board diversity and accountability**
 - 73% of companies engaged since July 2017 have since added at least one diverse director to their boards (584 of 800 companies). Excluding delisted, acquired, and bankrupt companies, 81% of companies engaged have added at least one diverse director to their boards (550 of 682 companies)
 - Voted “against” 197 directors at companies where diversity engagements did not result in constructive outcomes (by comparison voted “against” 214 directors in FY19-20). Ran 8 shareowner campaigns at non-responsive companies surrounding board diversity (5 Majority Vote / 3 Vote “No” Campaigns)
 - Staff is in the process of identifying the 2021 target list of diversity companies
 - Partnered with CalSTRS, LACERA and SFERS on the California Board Diversity Initiative to improve board diversity at S&P 500 companies surrounding underrepresented groups
- **Engaged Climate Action 100+ companies**
 - CalPERS is leading engagements at 22 companies including 6 Japanese companies
 - Staff is currently evaluating engagement “next steps” for 2022 proxy season, including filing shareowner proposals
 - CalPERS filed/co-filed 3 shareowner proposals (2 withdrawn and 1 achieved 28% support)
 - Ran proxy solicitations at 6 companies at which climate-related proposals were flagged by the CA100+ initiative. Three proposals passed with majority support
 - Results and progress of collaborative engagements are detailed in the Climate Action 100+ December 2020 Progress Report (<http://www.climateaction100.org/>)

Governance & Sustainability | CalPERS' U.S. Executive Compensation Votes: FY 2014-15 to FY 2020-21



- 2017: Performed extensive research on executive compensation and pay-for-performance (P4P)
- FY 2017-18: Implemented enhanced voting practices on executive compensation ("Say on Pay") proposals in the United States. Voted "against" 39% of SOP proposals
- FY 2018-19: Developed and implemented a new proprietary 5-year quantitative model as part of the enhancement of the CalPERS Executive Compensation Analysis Framework to review SOP proposals. Voted "against" 52% of SOP proposals
- FY 2019-20: Applied further enhancements to the executive compensation analysis framework. Voted "against" 51% of SOP proposals and "against" 3,159 Compensation Committee members
- FY 2020-21: Voted "against" 54% SOP proposals and 3,896 Compensation Committee members

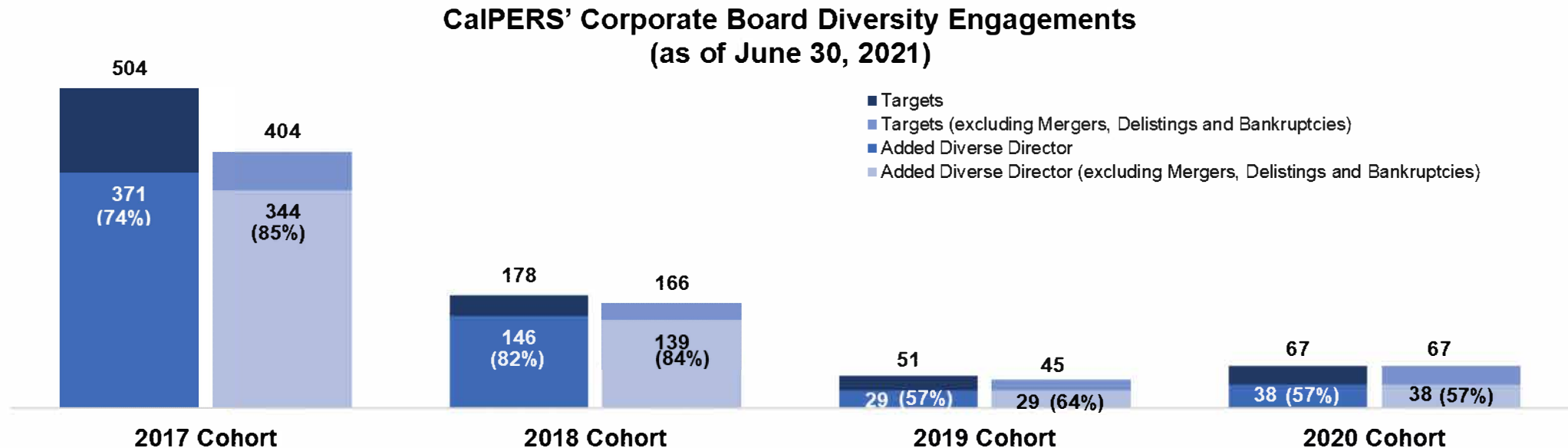
Governance & Sustainability | CalPERS' Corporate Board Diversity Initiative Cumulative Engagements (July 2017 to July 2021)



- **Market-wide improvements in corporate board diversity**

- ✓ 95% of Russell 3000 companies now have at least one female director compared to 78% in Q2 2017 (Q1 2021 Equilar data)
- ✓ 24% of Russell 3000 board seats are now held by women compared to 16% in Q2 2017 (Q1 2021 Equilar data)
- ✓ 100% of S&P 500 companies now have at least one female director on their boards (2020 U.S. Spencer Stuart Board Index)

Governance & Sustainability | CalPERS' Corporate Board Diversity Engagements (2017 to 2020 Cohorts)



- ✓ 74% of the 2017 corporate board diversity cohort have since added a diverse director to their boards following CalPERS' engagement. Excluding delisted, acquired and bankrupt companies, 85% have added a diverse director. Engagements started in July 2017
- ✓ 82% of the 2018 corporate board diversity cohort have since added a diverse director to their boards following CalPERS' engagement. Excluding delisted, acquired and bankrupt companies, 84% have added a diverse director. Engagements started in October 2018
- ✓ 57% of the 2019 corporate board diversity cohort have since added a diverse director to their boards following CalPERS' engagement. Excluding delisted, acquired and bankrupt companies, 64% have added a diverse director. Engagements started in July 2019
- ✓ 57% of the 2020 corporate board diversity cohort have since added a diverse director to their boards following CalPERS' engagement. Excluding delisted, acquired and bankrupt companies, 57% have added a diverse director. Engagements started in July 2020

Governance & Sustainability | Climate Action 100+



CalPERS is playing a leading role in both strategy and implementation

- CalPERS convened the initiative following the carbon footprint of our global equity portfolio in 2015
 - Inaugural Chair (and current Chair) of the CA100+ Steering Committee
 - Initiative now has over 575 signatories with over \$54 trillion in assets under management
 - Signatories are engaging the 100 companies with the largest GHG emissions

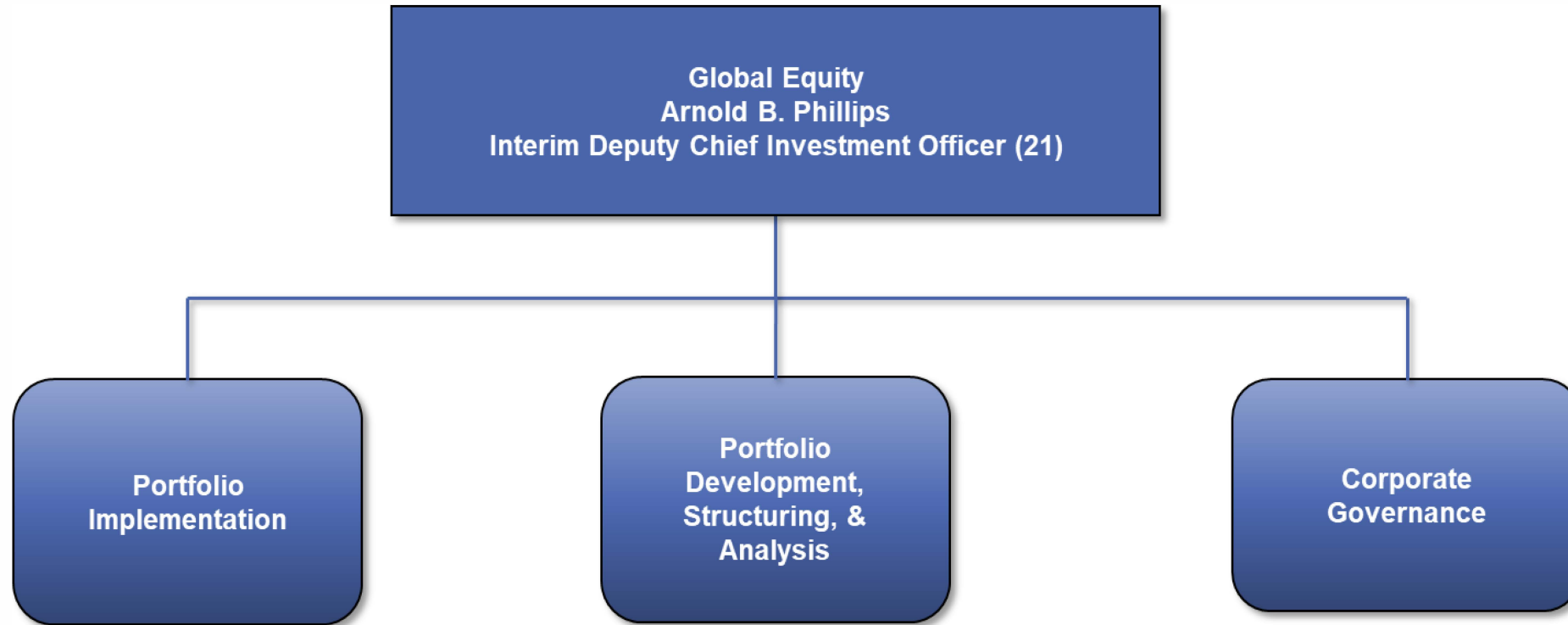
Notable successes

- Over half (53%) of CA100+ companies have now set a net zero by 2050 target or ambition
- CA100+ Net Zero Benchmark launched in March 2021
- ExxonMobil: CalPERS publicly supported and ran a proxy solicitation in support of four Engine No.1 director nominees and a proposal requesting improved disclosure of lobbying objectives
 - Three Engine No.1 director nominees were elected, and the lobbying proposal passed with 64% support

Climate Action 100+ Engagement Goals

- Investors signed on to Climate Action 100+ are requesting the boards and senior management of companies to:
 - Improve the governance of climate-related risks and opportunities
 - Curb greenhouse gas (GHG) emissions across the value chain to be consistent with net-zero by 2050, and
 - Strengthen climate-related financial disclosures in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

Global Equity | Functional Org Chart



Global Equity | Program Costs

Expense Type	FY 2020-21			FY 2019-20		
	Avg AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ³ (BPS)	Avg AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ³ (BPS)
Internal Management ¹	\$ 219,238	\$ 5.7	0.3	\$ 185,826	\$ 10.2	0.5
External Management ²	\$ 7,190	\$ 40.6	57	\$ 9,223	\$ 48.2	52
Consultants Expense	N/A	\$0.8	0.0	N/A	\$0.9	0.0
Technology & Operating Expense	N/A	\$ 14.9	0.7	N/A	\$ 15.5	0.8
Total Program	\$ 226,429	\$ 62.0	3	\$ 195,050	\$ 74.9	4

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Real Assets

Global Fixed Income | Role in the Total Fund

Percentage of PERF

	Target	<u>Actual</u> (as of <u>6/30/2021</u>)
Total Income	28% (+/- 6%)	29.8%
Long Spread	15%	15.1%
Long Treasury	10%	10.3%
High Yield	3%	3.0%
Total Fund Income	N/A	1.5%

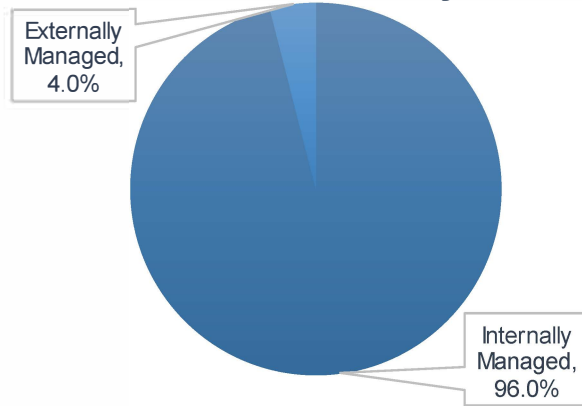
Total Fund Role

- Serve as an economic diversifier to equity risk and be a reliable source of income and liquidity

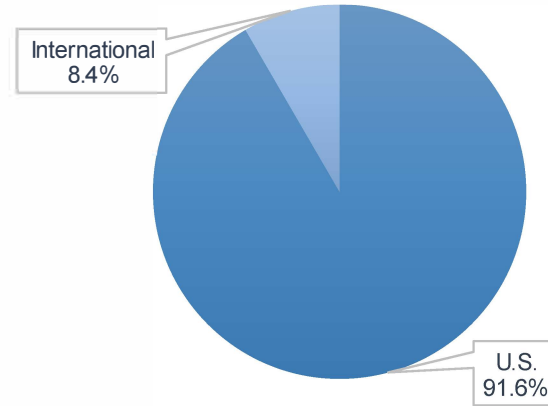
Global Fixed Income | Characteristics & Positioning

For Period Ending June 30, 2021

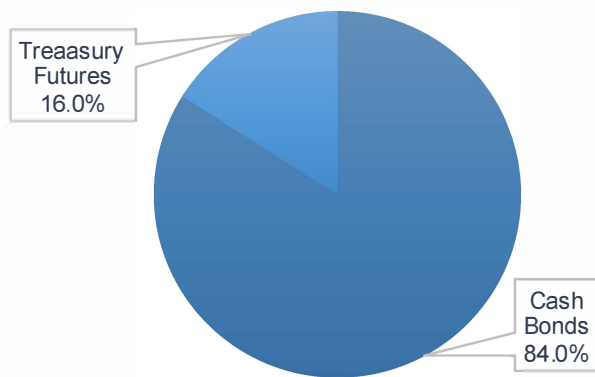
Income Is 96% Internally Managed



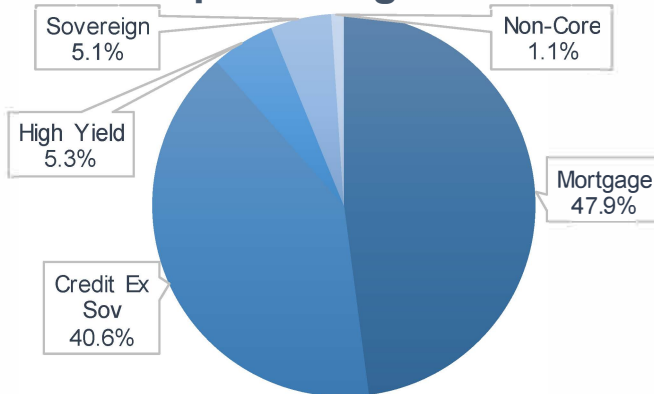
Income U.S. vs International



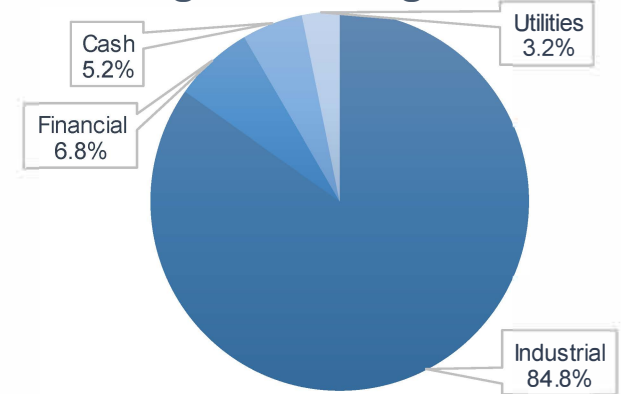
U.S. Treasury Segment



Spread Segment



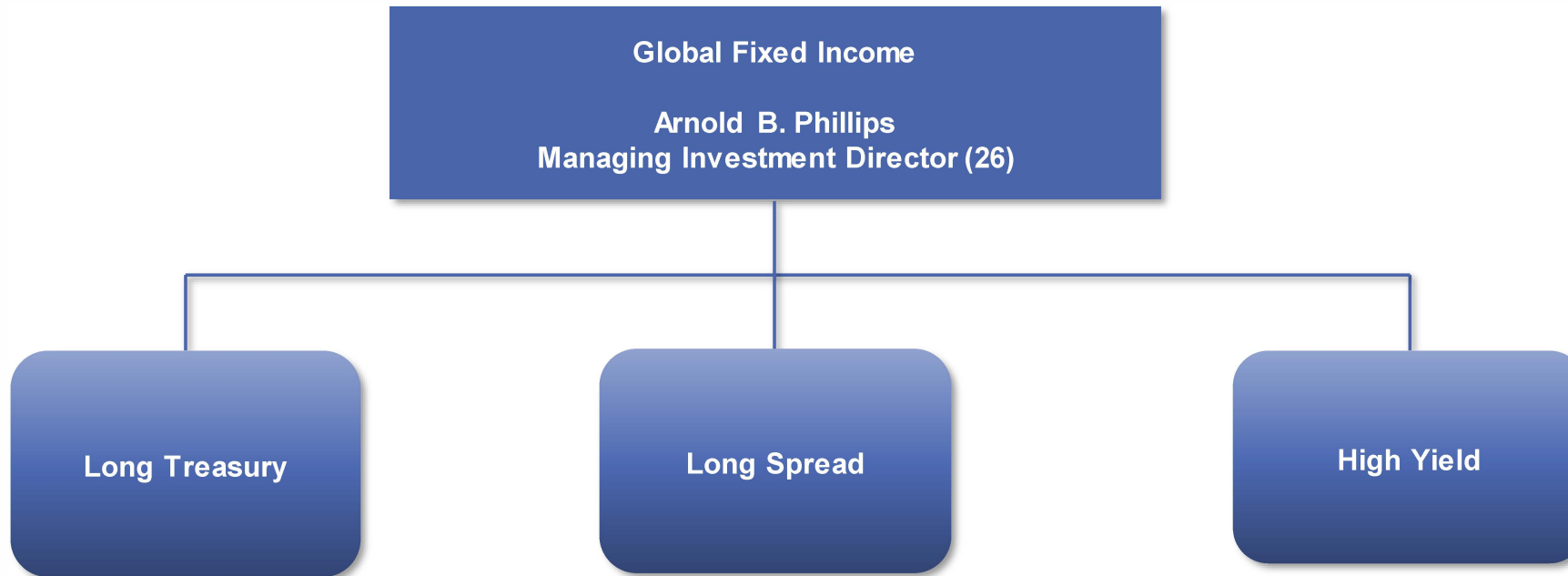
High Yield Segment



Global Fixed Income | Integration of Governance & Sustainability Examples

- Completed annual UNPRI for GFI and the quarterly ESG risk factor assessments for Corporate portfolio using MSCI ESG scores
- Implemented new ESG risk screening tool using rating agency scores
- Invested in new issues of green bonds and grew holdings to \$425mn
- Reduced exposure to industries with growing ESG issues and industries impacted by the pandemic (social factor)
- Collaborated with Corporate Governance on engagements
- Collaborated with Governance & Sustainability and Research & Strategy teams on:
 - Presentation to INVO staff on sustainable investment practices across asset classes
 - Sustainable Investment Strategic Plan 5 year update and Climate Change Risk

Global Fixed Income | Functional Org Chart



Global Fixed Income | Program Costs

	FY 2020-21			FY 2019-20		
	Avg AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ² (BPS)	Avg AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ² (BPS)
Internal Management	\$ 127,247	\$ 7.7	1	\$ 106,789	\$ 9.4	1
External Management ¹	\$ 4,100	\$ 16.8	41	\$ 3,781	\$ 14.1	37
Consultants Expense	N/A	\$0.0	0	N/A	-\$0.2	0
Technology & Operating Expense	N/A	\$ 13.4	1	N/A	\$ 13.0	1
Total Program	\$ 131,347	\$ 37.9	3	\$ 110,570	\$ 36.3	3

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Opportunistic Strategies | Role in the Total Fund

Deliver added value to the Total Fund, by implementing investment strategies across the entire capital structure that do not fit into existing asset classes.

- Invest up to total allowable size of 5% of the total PERF NAV
- Invest in strategies that are not in the benchmark of other asset classes
- Work closely with Trust Level Portfolio Management & Implementation and other asset classes to ensure adequate liquidity
- Private debt mandate

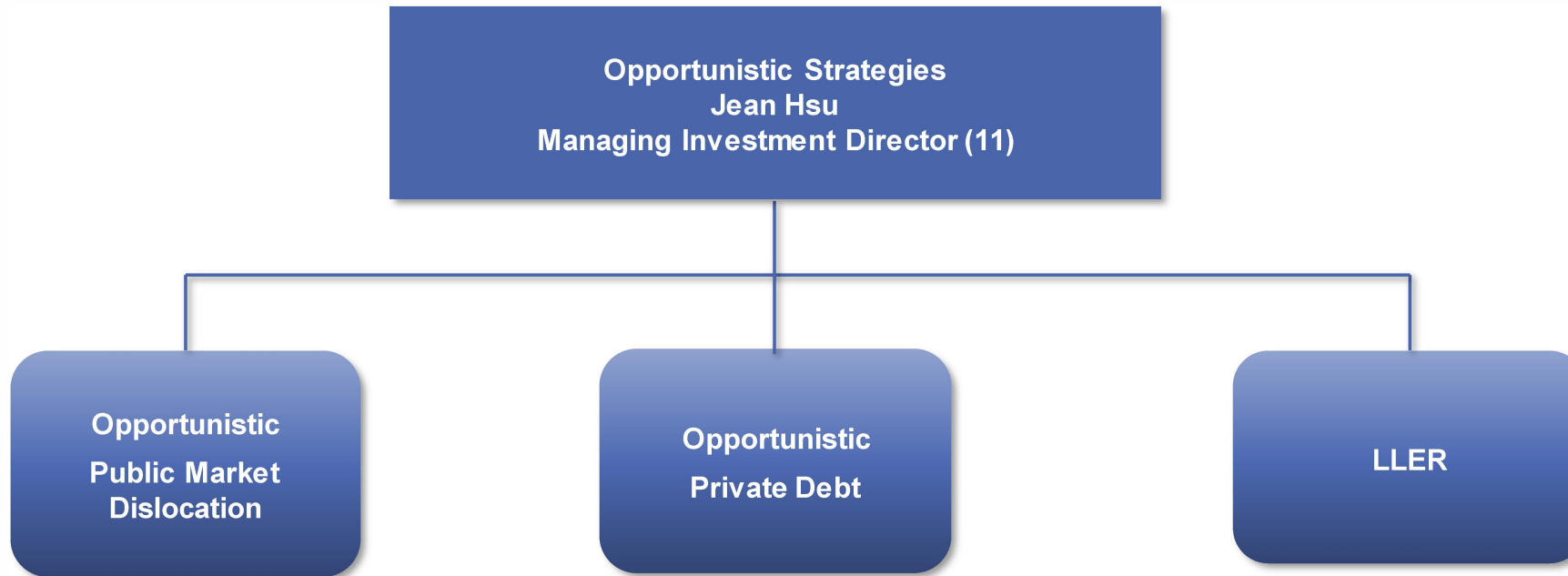
Opportunistic Strategies | Characteristics & Positioning

Strategy	Range*
Bank Loans and CLO	0% - 40%
Public Market Dislocation	0% - 50%
Middle Market Direct Lending	0% - 80%
Specialty Lending	0% - 40%
Liquidity Financing	0% - 40%
Real Estate Financing	0% - 40%
Structured Products and Whole Loans	0% - 20%

* Evolving market opportunities preclude specifying target percentages

- As of 6/30/2021, \$1.9 Billion capital deployed

Opportunistic Strategies | Functional Org Chart



Opportunistic Strategies | Program Costs

	FY 2020-21			FY 2019-20		
	Avg AUM ² (\$millions)	Fees & Profit Sharing Paid (\$millions)	Fees & Profit Sharing Paid ³ (BPS)	Avg AUM ² (\$millions)	Fees & Profit Sharing Paid (\$millions)	Fees & Profit Sharing Paid ³ (BPS)
Internal Management	\$ 10,721	\$ 2.1	2	\$ 11,973	\$ 1.4	1
External Management ¹	\$ 903	\$ 4.6	51	\$ 97	\$0.5	52
Consultants Expense	N/A	\$0.1	0	N/A	\$0.2	0
Technology & Operating Expense	N/A	\$ 1.2	1	N/A	\$ 1.2	1
Total Program	\$ 11,625	\$ 8.0	7	\$ 12,070	\$ 3.3	3



¹ Includes base and performance fees

² OS FY 2020-21 only manages non-unitized funds compared to FY 2019-20 where it manages both unitized and non-unitized funds. For informational purposes, the AUM balances include these unitized funds for FY 2019-20 since they are managed by OS, even though they are already reported separately in the AUM of the Program Area that owns those shares.

³ BPS calculated on fee type AUM. Internal Management, Consultants and Technology & Operating Expense BPS calculated on Total Program AUM

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Private Equity | Role in the Total Fund

Percentage of PERF

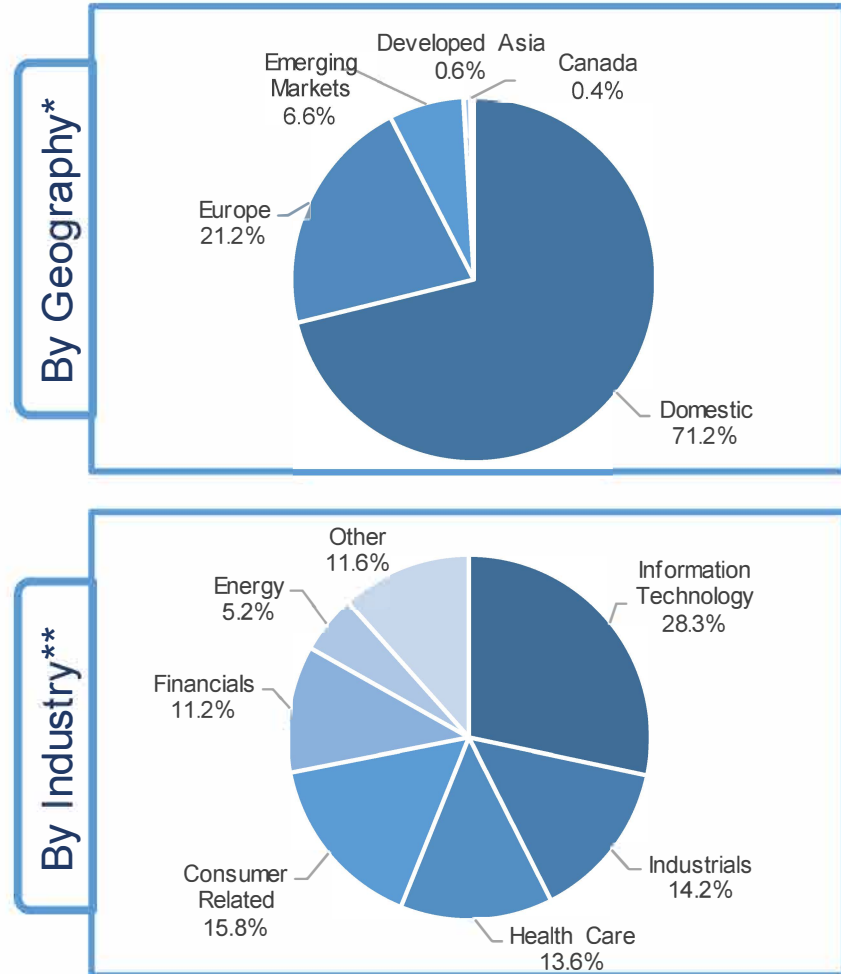
	Target	Actual (as of <u>6/30/2021</u>)
Private Equity	8% (+/- 4%)	8.3%

Total Fund Role

- Enhancing equity returns through an active, value-added approach
- The major driver for returns is appreciation, aided by leverage, with negligible cash yield

Private Equity | Characteristics & Positioning

Investment Type	Net Asset Value (NAV)*	% of NAV
Funds	\$27,054	69.6%
Fund-of-Funds	\$1,759	4.5%
Co-Investments/ Direct Investments	\$2,982	7.7%
Separate Accounts	\$6,916	17.8%
Other	\$144	0.4%
TOTAL	\$38,855	100%



Private Equity | Additional Information

- Restricting Private Equity Investments in Public Sector Outsourcers Policy:
 - To the best of CalPERS knowledge, the Policy has been effective in limiting our General Partners investments in public sector outsourcers, as CalPERS has not received any waiver requests in the last 12 months and all of our GPs have agreed to make good faith efforts to comply with the Policy.
 - This Policy has had no negative impact on PE Program investment opportunities.
- Status of Absolute Return Strategies (ARS) winddown/composition:
 - ARS legacy portfolio NAV of \$199.4M as of 6/30/2021, across 4 remaining positions.
 - Staff continues to actively seek monetization opportunities in the underlying portfolio with the respective managers.

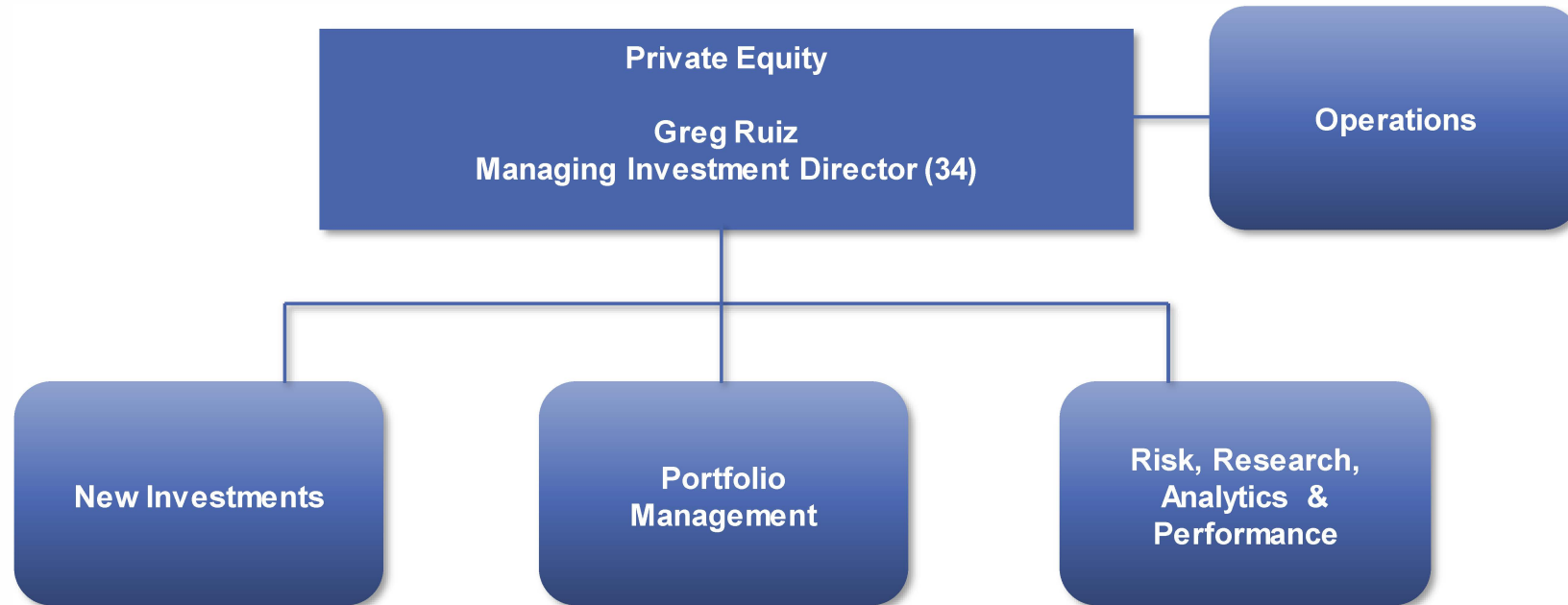
Private Equity | Integration of Governance & Sustainability Examples

CalPERS PE is developing a sustainability strategy to further integrate ESG factors into our assessment processes

PE currently integrates environmental, social, and governance (ESG) considerations by:

- Reviewing how GPs incorporate ESG into their investment process through the ILPA DDQ that includes a UNPRI-developed ESG questionnaire.
- Discussing ESG practices and issues at the Limited Partner Advisory Committee (LPAC) meetings.

Private Equity | Functional Org Chart



Private Equity | Program Costs

	FY 2020-21				FY 2019-20		
	AUM (\$millions)	Fees & Profit Sharing Paid (\$millions)	Fees & Profit Sharing Paid ² (BPS)		AUM (\$millions)	Fees & Profit Sharing Paid (\$millions)	Fees & Profit Sharing Paid ² (BPS)
Internal Management	\$	\$ 7.7	2		\$	\$ 7.2	3
External Management ¹	\$ 38,854	\$ 826.4	213		\$ 24,553	\$ 550.9	224
Consultants Expense	N/A	\$ 1.8	0		N/A	\$ 2.1	1
Technology & Operating Expense	N/A	\$ 8.2	2		N/A	\$ 8.7	4
Total Program	\$ 38,854	\$ 844.1	217		\$ 24,553	\$ 568.9	232

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Real Assets | Role in the Total Fund

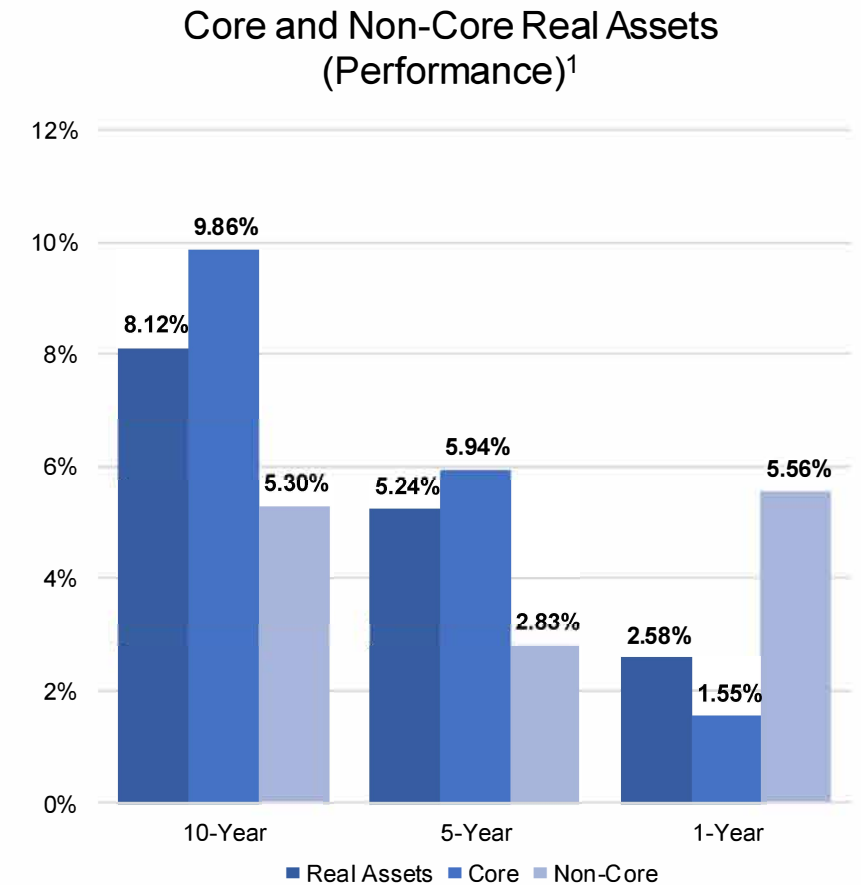
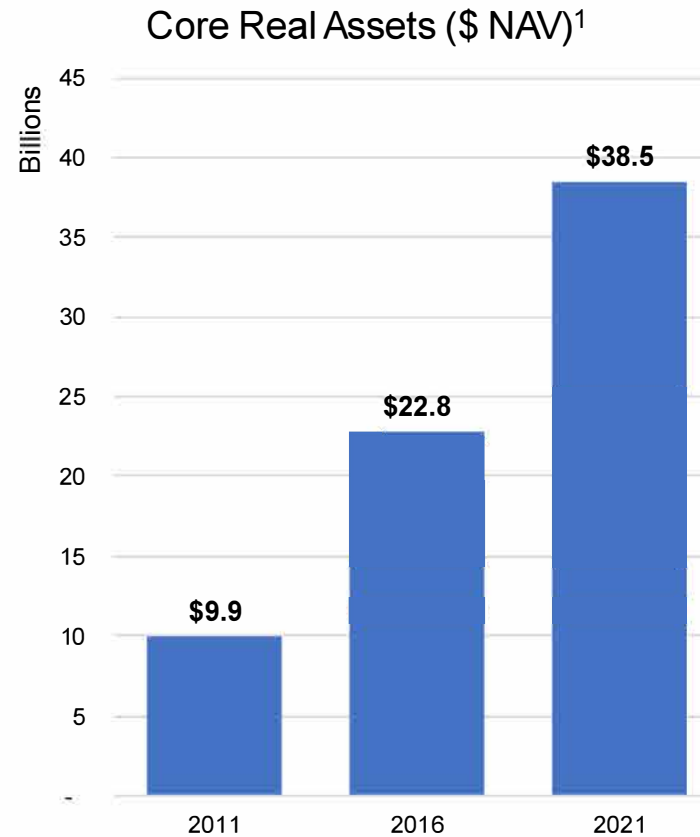
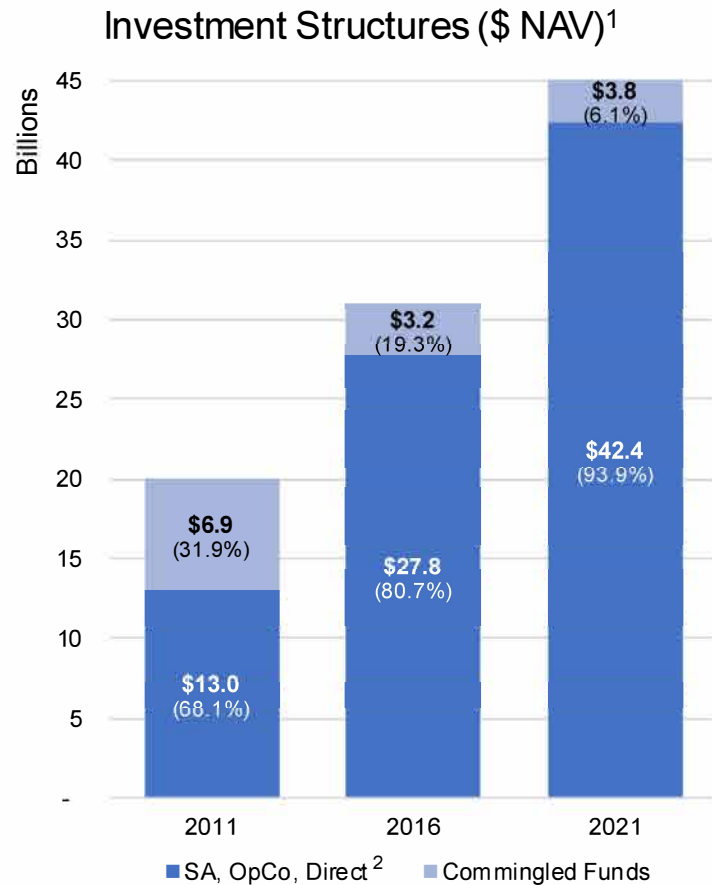
Percentage of PERF

	Target	Actual (as of <u>6/30/2021</u>)
Real Assets	13% (+/- 5%)	9.6%

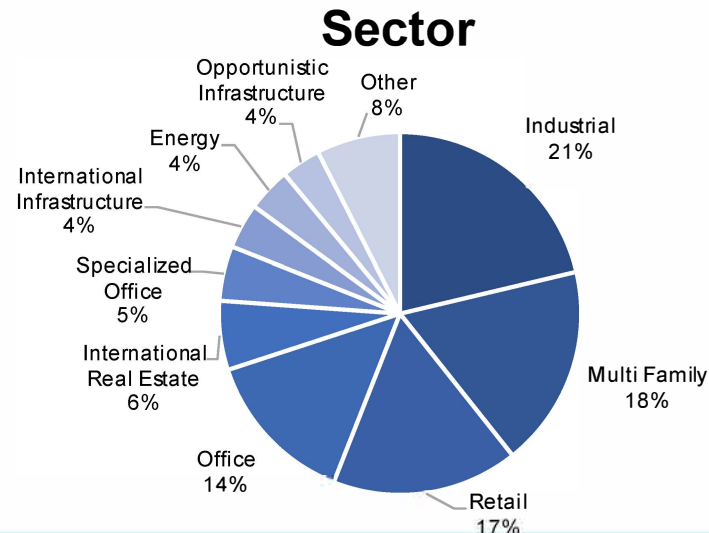
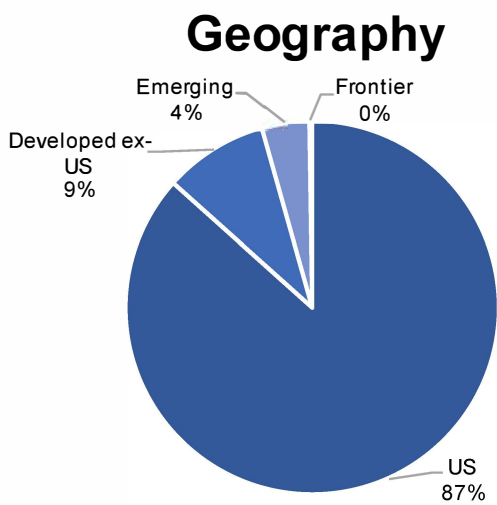
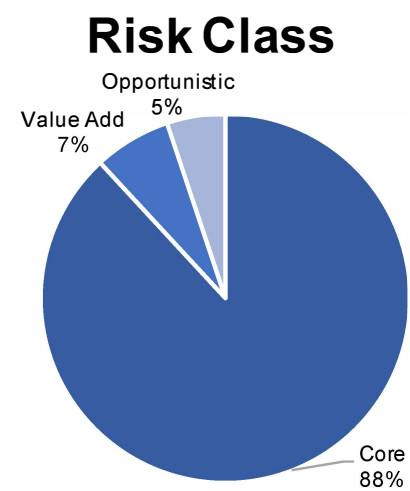
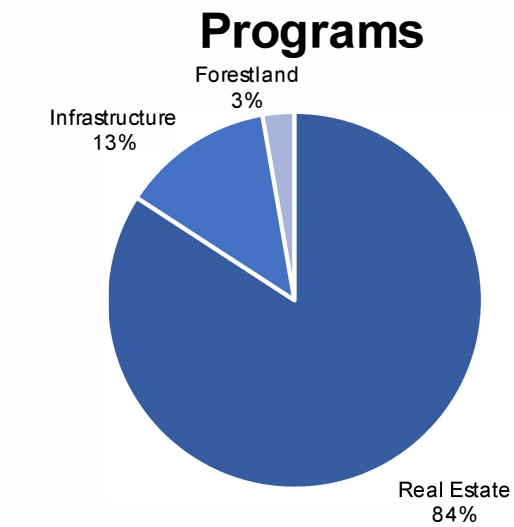
Role in the Total Fund

- Stable cash yield and economic diversifier to equity risk
 - Diversification
 - Income
 - Inflation

Real Assets | Characteristics & Positioning



Real Assets | Characteristics & Positioning

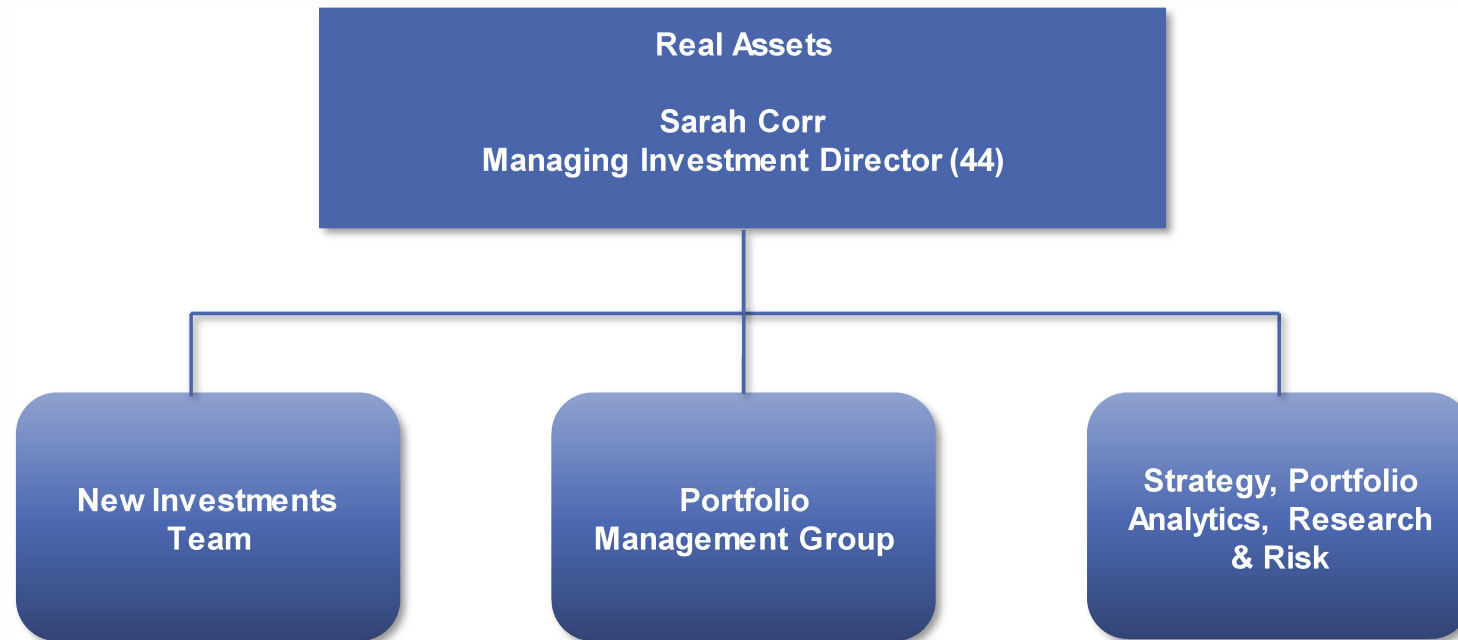


Note: The graphs are based on data from AREIS.

Real Assets | Integration of Governance & Sustainability

Activities	Description / Status
Real Assets Sustainable Investment Practice Guidelines (SIPG)	<ul style="list-style-type: none">Real Assets SIPG demonstrate integration of CalPERS Investment Beliefs and consideration of ESG factors throughout the investment decision making process
Global Real Estate Sustainability Benchmark (GRESB)	<ul style="list-style-type: none">CalPERS represented on both the infrastructure and real estate advisory boards of GRESB85% of the portfolio submitted into GRESB in 2020 (in line with prior year)
UNPRI	<ul style="list-style-type: none">Completed 2021 extensive UNPRI survey in close collaboration with BGS, RSG and other asset classes
ESG Consideration Matrix	<ul style="list-style-type: none">Continue to refine framework for assessing ESG risks and opportunities for all acquisitions through separate accounts
Energy Optimization (EO) Initiative	<ul style="list-style-type: none">Staff identified economically attractive EO opportunities generating savings over time
Climate Risk Review & Carbon Footprint	<ul style="list-style-type: none">Incorporated in CalPERS' Strategic Governance & Sustainability Initiatives and Real Assets Strategic PlanCompleted carbon footprint assessment, included results in CalPERS' Investment Strategy on Climate Change Report
Responsible Contractor Program (RCP)	<ul style="list-style-type: none">CalPERS Separate Account operating agreements include provisions requiring compliance with the RCP Policy
Other	<ul style="list-style-type: none">Continue to contribute to Total Fund research initiatives, working collaboratively with RSG and BGS

Real Assets | Functional Org Chart



Real Assets | Program Costs

	FY 2020-21			FY 2019-20		
	AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ² (BPS)	AUM (\$millions)	Fees Paid (\$millions)	Fees Paid ² (BPS)
Internal Management	\$0	\$ 10.0	2	\$0	\$ 10.1	2
External Management ¹	\$ 45,254	\$ 325.2	72	\$ 44,080	\$ 345.1	78
Consultants Expense	N/A	\$ 1.0	0	N/A	\$ 2.2	0
Technology & Operating Expense	N/A	\$ 10.8	2	N/A	\$ 16.4	4
Total Program	\$ 45,254	\$ 347.0	77	\$ 44,080	\$ 373.8	85