Mass

PRESENTATION TO THE STATE RETIREE BENEFITS TRUST FUND BOARD

PRESENTED BY

Paul W. Todisco, Senior Client Services Officer Francesco Daniele, Senior Client Services Officer Emily Green, Client Services Analyst

December 3, 2020

Deborah B. Goldberg, Treasurer and Receiver General, Chair Michael G. Trotsky, CFA, Executive Director and Chief Investment Officer

PRIT Fund Snapshot

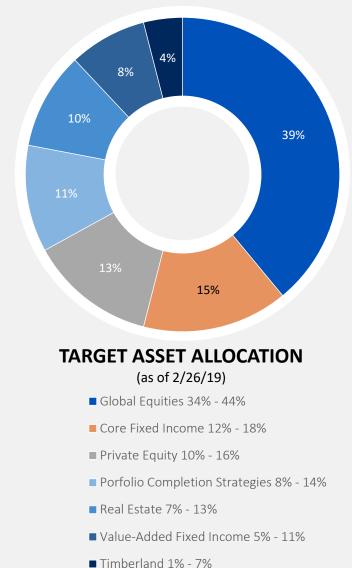
PRIT FUND FACTS

- \$79.6 billion AUM
- 48 public markets portfolios
- 15 real estate, timber and REIT managers
- 100+ private equity managers; 200+ partnerships
- 32 portfolio completion strategies managers

OVERSIGHT AND STAFFING

- 9 appointed and elected trustees
- 4 advisory committees, consisting of 37 industry professionals and Board members
- Staff of 49 professionals
 - 2 PhDs
 - 10 CFAs
 - 6 CPAs
 - 2 CAIAs
 - 20 CFA Investment Foundations Program Certificate Holders

ASSET ALLOCATION





About PRIM



\$79.6 billion investment fund that invests public employee pension benefits

- PRIM has a professional, experienced and focused investment staff.
- PRIM does not administer benefits.

PRIM's mission is to relieve the pension funding burden on the taxpayer

- Self-funded agency which generates asset returns for the Massachusetts pension system.
- PRIM's Project SAVE initiative is approaching \$200 million annualized value enhancing activities for the fund annually.

PRIM is independent and governed by a nine-member Board of Trustees

- Massachusetts State Treasurer is the Chair of the PRIM Board.
- A robust committee structure lends investment and operational expertise to the decision-making process.





PRIM Core Beliefs

We believe that any investment must be evaluated on three equally important parameters: return, risk and cost.

We don't make tactical asset allocation decisions or investment decisions based on market or economic predictions. Instead, we engineer a strategic, long-term asset allocation strategy that we hope will stand the test of a long-time horizon.

We value a basis point of cost reduction more than a basis point of return. Because we can count on cost savings every year, but nobody ever really knows what the markets will deliver.

PRIM Top 10 Accomplishments

1	Stable organization: Exceptional staff with low turnover supported by a strong, stable Board and Committee structure	7	 Re-engineered Hedge Fund program – Portfolio Completion Strategies Direct hedge funds Hedge fund replication
2	National recognition for PRIM and its staff		 Emerging manager direct hedge fund Hedge fund and other credit fund co- investment
3	Strong relative and absolute investment performance	8	Enhanced manager search and selection process
4	Sophisticated risk management platform and framework	9	Private Equity co-investment
5	Methodical asset allocation decisions	10	Direct Real Estate Program
6	Project SAVE		



PRIM Board



Ruth Ellen Fitch	James B.G. Hearty	Example 2 of the second	Carly Rose	Theresa F. McGoldrick, Esquire	Dennis J. Naughton	Robert L. Brousseau	Paul E. Shanley, Esquire
Appointee of the State Treasurer	Designee of the Governor, Ex Officio Member	Appointee of the Governor, Non-State Employee or Official	Appointee of the Governor, Public Safety	State Retirement Board Member (SRB)	Teachers' Retirement Board Member (TRB)	Elected Representative State Teachers' Retirement System	Elected Representative State Employees Retirement System



PRIM Advisory Committees

Investment Committee

The Committee advises the Board with respect to the asset allocation policy of PRIM and related investment policies and assist the Board in overseeing the investment program. The mandate of the Investment Committee does not include real estate and timber. Members include:

- 1. Deborah B. Goldberg, Chair, Ex Officio Board Member
- 2. Paul E. Shanley, Board Member
- 3. Ruth Ellen Fitch, Board Member
- 4. Joseph C. Bonfiglio, Massachusetts & Northern New England Laborers' District Council
- 5. C. LaRoy Brantley, Investment Consultant
- 6. Michael Even, CFA, Retired President and CEO, Numeric Investors
- 7. Constance M. Everson, CFA, Managing Director, Capital Markets Outlook Group
- 8. James B. G. Hearty, Retired Investment Professional
- 9. Peter Monaco, Managing Director, Raptor Group
- **10. Philip Rotner**, Chief Investment Officer, Boston Children's Hospital
- 11. Glenn P. Strehle, CFA, Treasurer Emeritus, MIT
- 12. Timothy L. Vaill, Special Advisor

Real Estate Committee

The Committee advises the Board in setting investment policy within the real estate and timber portfolios and assist the Board in overseeing these portfolios. Members include:

- 1. Deborah B. Goldberg, Ex Officio Board Member
- 2. Lydia Chesnick, Esq., Partner, Bernkopf Goodman LLP
- 3. Robert Gifford, Robert Gifford Advisory
- 4. Jill S. Hatton, Chair, CRE, Real Estate Investment Professional
- 5. Anthony E. Hubbard, Esq., CVS Corporation
- 6. Jack Lutz, PhD., Forest Research Group
- 7. William F. (Bill) McCall, Jr., CRE, McCall & Almy, Inc.
- 8. Garlan Morse, Jr., CRE, Morris and Morse Company, Inc.
- 9. Peter F. O'Connell, Marina Bay Company
- 10. Carly Rose, Public Safety Union Member

PRIM Advisory Committees

Administration and Audit Committee

The Committee assists the Board in overseeing all issues related to the governance, administration, and audit functions of PRIM, and to provide recommendations for the Board's consideration. Members include:

- 1. Deborah B. Goldberg, Ex Officio Board Member
- 2. Robert L. Brousseau, Chair, Board Member
- 3. Theresa F. McGoldrick, Esq., Board Member
- 4. Patrick E. Brock, Chairman of the Hampshire County Retirement Board
- 5. Joseph A. Connolly, Senior Managing Director, Strategic Development, TerraCap
- 6. Karen E. Gershman, CPA, Retired Chief Operating Officer, Health Advances
- 7. Eileen Glovsky, Treasurer Appointee
- 8. James B. G. Hearty, Retired Investment Professional
- 9. Dennis J. Naughton, Board Member
- **10. Michele A. Whitham**, Esq., Founder & Principal, Whitham Law LLC

Compensation Committee

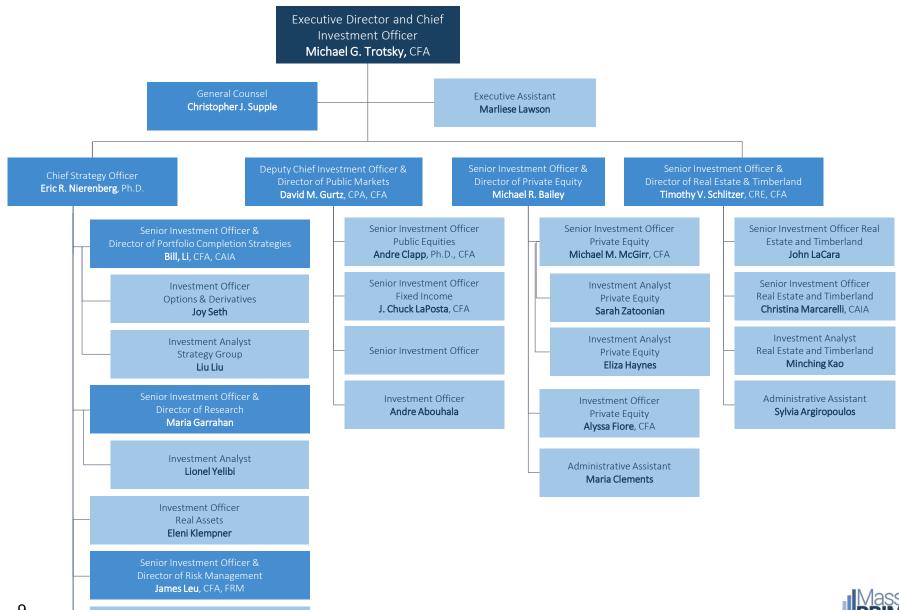
The Committee assists the Board in overseeing staff compensation and benefit policies. The Administration and Audit Committee is responsible for assisting the Board on other human resource matters. Members include:

- 1. Deborah B. Goldberg, Chair, Ex Officio Board Member
- 2. Robert L. Brousseau, Board Member
- 3. Patrick E. Brock, Chairman, Hampshire County Retirement Board
- 4. Joseph A. Connolly, Senior Managing Director, Strategic Development, TerraCap
- 5. Michele A. Whitham, Chair, Esq., Founder & Principal, Whitham Law LLC

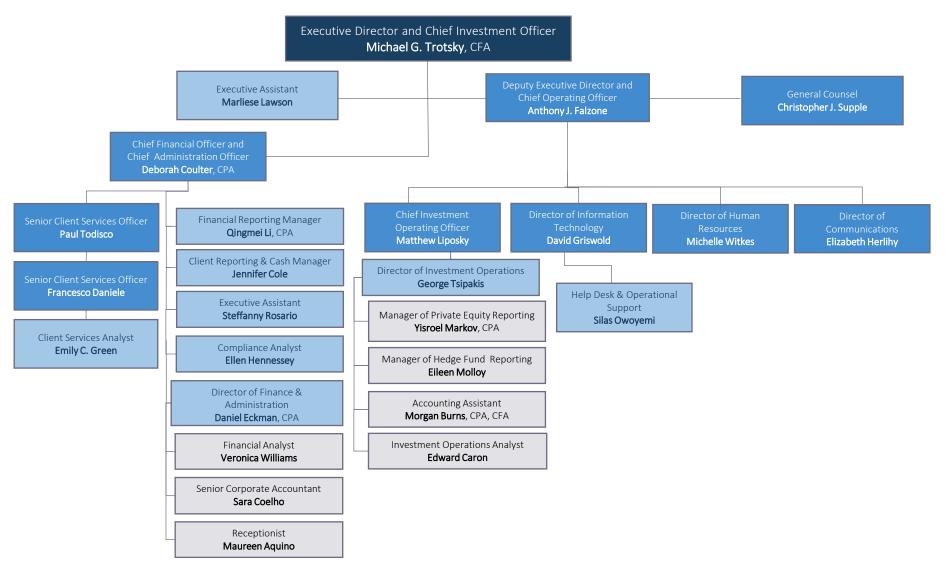


PRIM Investment Team

Administrative Assistant



PRIM Finance and Operations Team





External Advisors

Fund Advisors

- NEPC Asset Allocation
- Callon Associates Public Markets
- Aberdeen Asset Management Hedge Fund Investments
- Hamilton Lane Private Equity
- The Townsend Group Real Estate & Timber

Independent Auditors

- KPMG, LLP PRIM Board and PRIT Fund, Real Estate, Timber, and SASE 16 Reviews
- Deloitte & Touche, LLP PRIM Board tax consultant

Custodian

• BNY Mellon Corporation



Recent Recognition

MIT Sloan/PRIM Collaboration on Environmental, Social, and Governance Ratings Research

PRIM has joined with the MIT Sloan Sustainability Initiative as the founding member of the Aggregate Confusion Project. The groundbreaking collaboration seeks to create more reliable and transparent ESG data and benchmarks for Investors. (September 2020)

GIPS Compliance

For the third consecutive year, PRIM has completed the CFA Institute's Global Investment Performance Standards of Integrity and transparency. PRIM is one of only a handful of large public pension plans to comply with the GIPS standards. (August 2020)

PRIM's Private Equity Portfolio ranked #2 by the American Investment Council

For the second consecutive year, PRIM's Private Equity Portfolio has been ranked #2 among 176 U.S. public pension funds based on 10-year performance by the American Investment Council's Public Pension Study. PRIM is the only fund that has been in the top five every year the study has been conducted. (July 2020)

Certificate of Achievement for Excellence in Financial Reporting – Government Finance Officer Association

PRIM was awarded the Government Finance Officer Association's Certificate of Achievement for Excellence in Financial Reporting for the 15th consecutive year. (May 2020)

Institutional Investor's Lifetime Achievement Award

Michael Trotsky, CFA, Executive Director and Chief Investment Officer of Mass PRIM, was honored with Institutional Investor's Lifetime Achievement Award at the third annual Allocators' Choice Awards (December 2019)

Commonwealth's Citation for Outstanding Performance

Qingmei Li, CPA, on PRIM's finance team, received the Commonwealth's Citation for Outstanding Performance at a State House ceremony with Treasurer Deborah Goldberg, Chair of the PRIM Board. (October 2019)

Michael Trotsky elected as Chair of the Board of Directors for CFA Society Boston

CFA Society Boston has elected Michael Trotsky, CFA, Executive Director and Chief Investment Officer to serve as Chair of the Board of Directors. The CFA Society Boston serves 6,000 professionals representing 650 companies and is part of the CFA Institute with nearly 200,000 members. (June 2019)

Nominated for "Public Plan of the Year" at the Institutional Investor Hedge Fund Industry Awards

For an unprecedented fourth year in a row, PRIM was nominated for "Public Plan of the Year" at the Institutional Investor Hedge Fund Industry Awards, in June 2019. PRIM won this award in 2016. The other nominees in 2019 were Ontario Municipal, New Mexico, Wisconsin, Texas Teachers and Illinois Teachers. (May 2019)

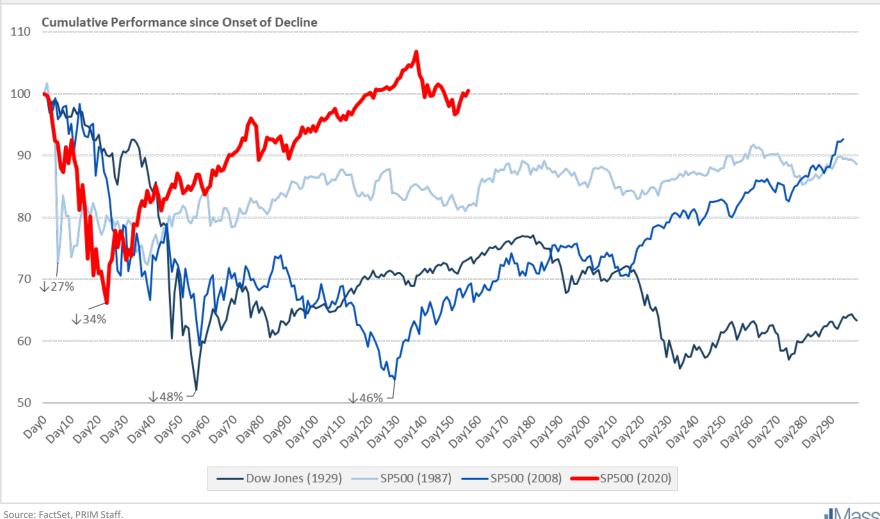


Unprecedented Sharp Decline

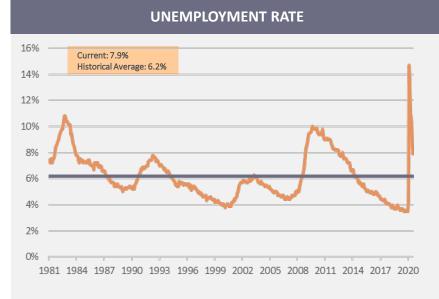
As of September 30, 2020

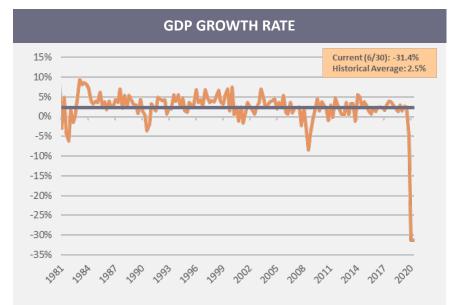


- Rebound velocity also surpassed that post previous sell-offs.
- S&P 500 reached new high in early September.

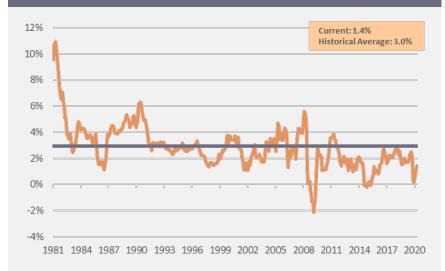


U.S. Economic Data





CONSUMER PRICE INDEX

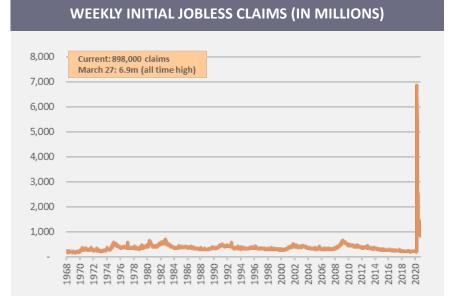


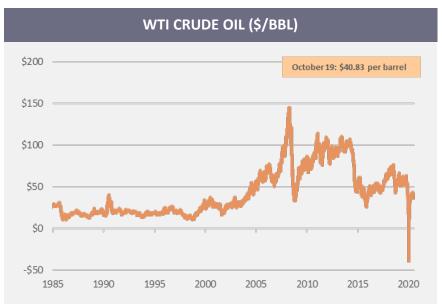
MANUFACTURING PMI



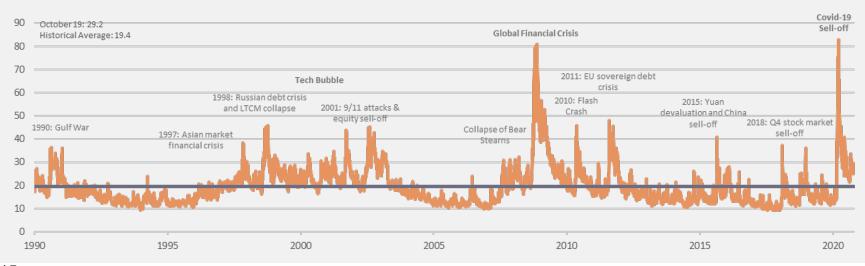
14 Source: FactSet, PRIM Staff. All data as of September 30, 2020 or most recent report.

U.S. Economic Data



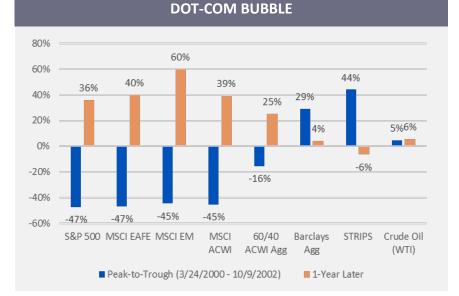


CBOE MARKET VOLATILITY INDEX (VIX)



15 Source: FactSet, PRIM Staff. All data as of September 30, 2020 or most recent report.

Historical Market Sell-Off Performance



2018 GLOBAL STOCK MARKET DOWNTURN



GLOBAL FINANCIAL CRISIS



100% 75% 80% 55% 48% 60% 46% 30% 31% 40% 17% 20% 6% 0% -1% -2% -20% -20% -40% -28% -30% -32% -34% -60% -56% -80% S&P 500 MSCI EAFE MSCI EM MSCI 60/40 Barclays STRIPS Crude Oil ACWI ACWI Agg Agg (WTI) Peak-to-Trough (2/19 - 3/23/2020) 3/23 - 10/19/2020

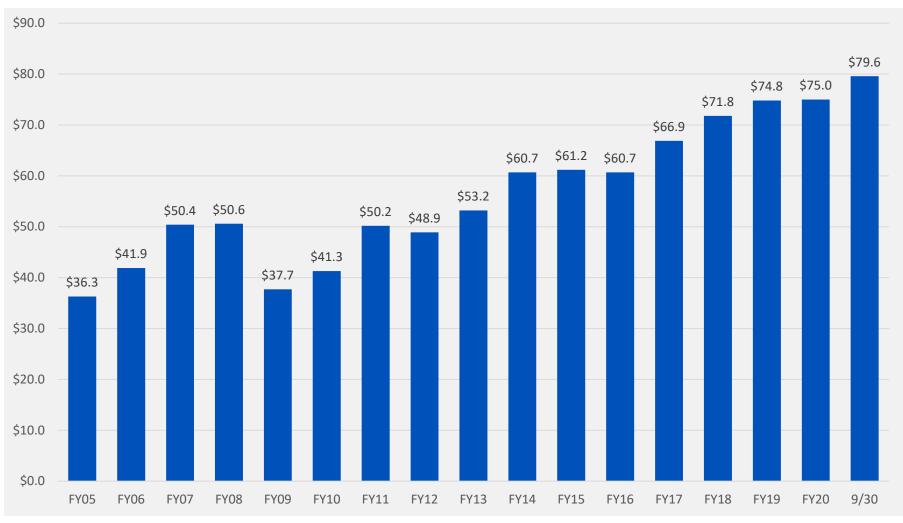
COVID-19 PANDEMIC

PRIT FUND PERFORMANCE



Total PRIT Fund Fiscal Year Market Value

Value (\$Billions)

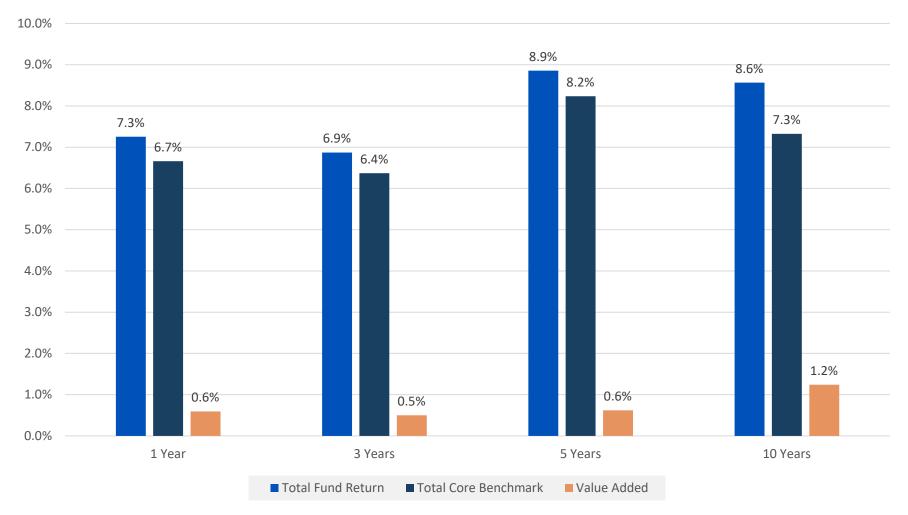


Mass

Source: BNY Mellon. As of September 30, 2020.

PRIT Fund Total Returns

Annualized Returns as of September 30, 2020 (Gross of Fees)

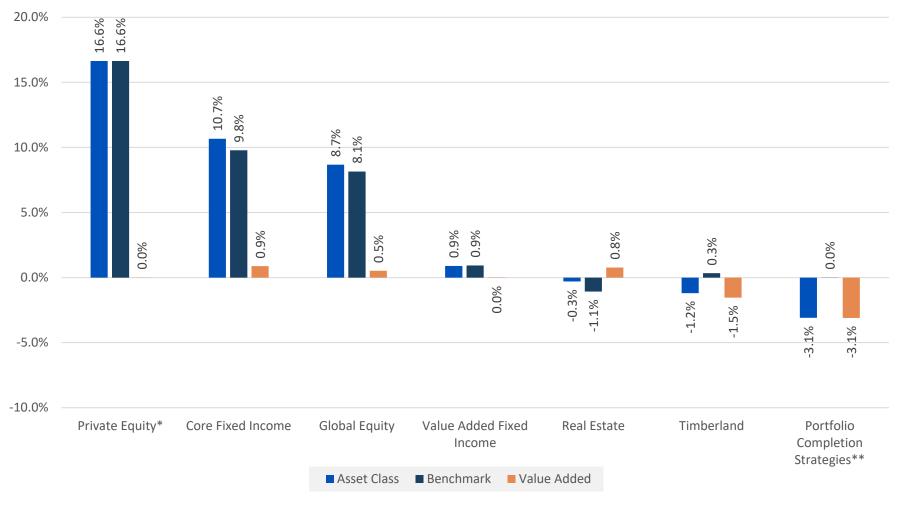


Mass

Source: BNY Mellon. Total Core Benchmark includes private equity benchmark.

PRIT Asset Class Performance Summary

One-Year Ended September 30, 2020 (Gross of Fees)

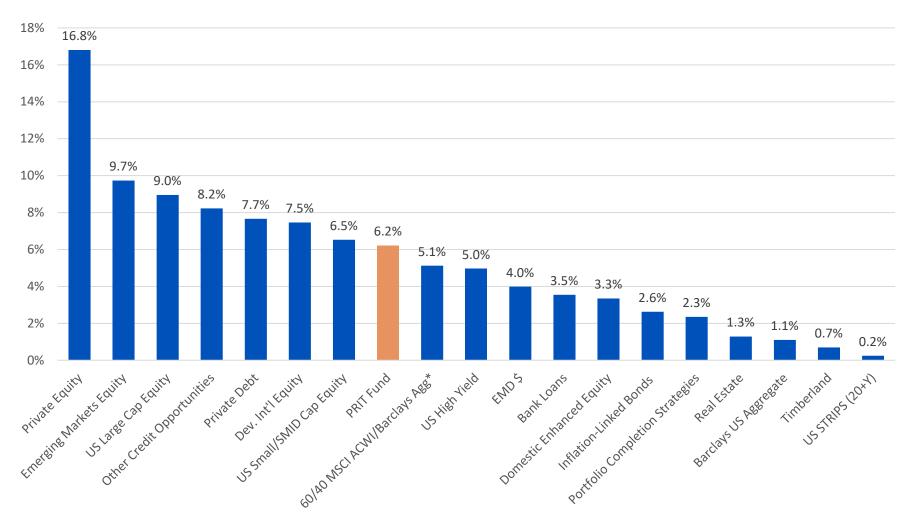


Source: BNY Mellon. Totals may not add due to rounding. *Benchmark is actual performance. **Hedge Fund returns are net of fees.



PRIT Performance By Strategy – Third Quarter 2020

Quarter Ended September 30, 2020 (Gross of Fees)

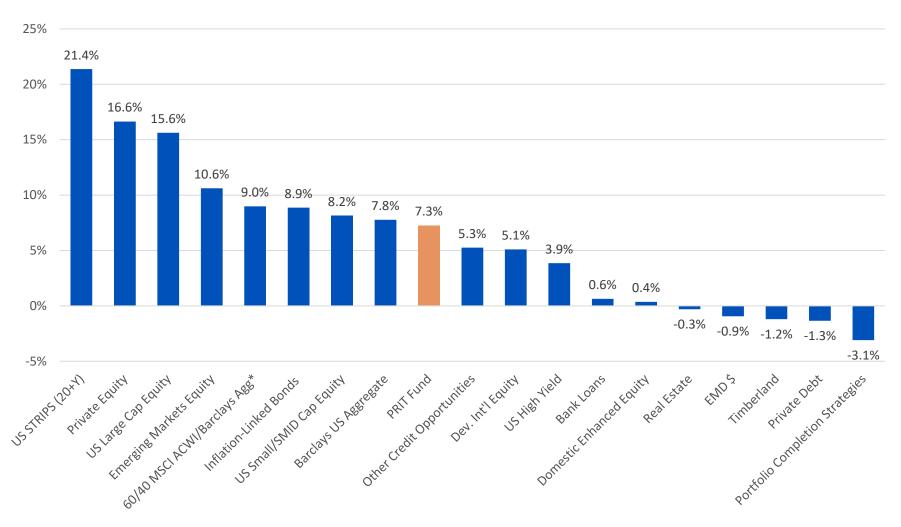


Source: BNY Mellon, FactSet. All performance figures reflected are PRIT Fund Asset Class returns. *MSCI ACWI/Barclays Aggregate is derived from a 60/40 combination of index returns.



PRIT Performance By Strategy – One-Year

One-Year Ended September 30, 2020 (Gross of Fees)



Source: BNY Mellon, FactSet. All performance figures reflected are PRIT Fund Asset Class returns. *MSCI ACWI/Barclays Aggregate is derived from a 60/40 combination of index returns.



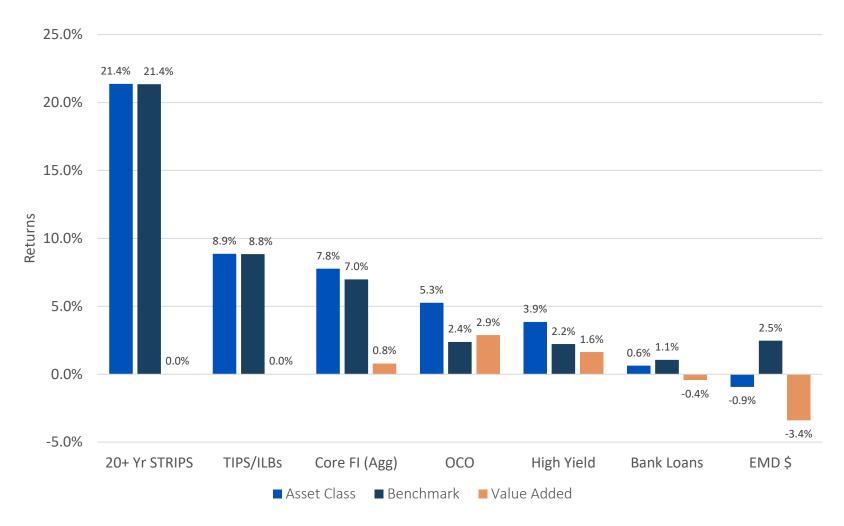
Global Equity Performance

One Year Ended September 30, 2020 (Gross of Fees)



Public Fixed Income Performance

One Year Ended September 30, 2020 (Gross of Fees)



Source: BNY Mellon. Totals may not add due to rounding.

PRIT Fund Annualized Returns By Asset Class

(Gross of Fees)

1 Year	3 Year	5 Year	10 Year	
PRIVATE EQUITY	PRIVATE EQUITY	PRIVATE EQUITY	PRIVATE EQUITY	
16.6%	18.3%	17.8%	18.3%	
CORE FIXED INCOME	CORE FIXED INCOME	GLOBAL EQUITY	REAL ESTATE	
10.7%	7.9%	10.2%	9.8%	
GLOBAL EQUITY	GLOBAL EQUITY	REAL ESTATE	GLOBAL EQUITY	
8.7%	6.2%	6.8%	8.8%	
VALUE-ADDED FIXED INCOME	REAL ESTATE	CORE FIXED INCOME	CORE FIXED INCOME	
0.9%	5.4%	6.1%	5.4%	
REAL ESTATE	VALUE-ADDED FIXED INCOME	VALUE-ADDED FIXED INCOME	VALUE-ADDED FIXED INCOME	
(0.3%)	3.3%	5.4%	5.4%	
TIMBERLAND	TIMBERLAND	TIMBERLAND	TIMBERLAND	
(1.2%)	2.3%	3.4%	4.9%	
PCS	PCS	PCS	PCS	
(3.1%)	1.2%	2.6%	3.7%	

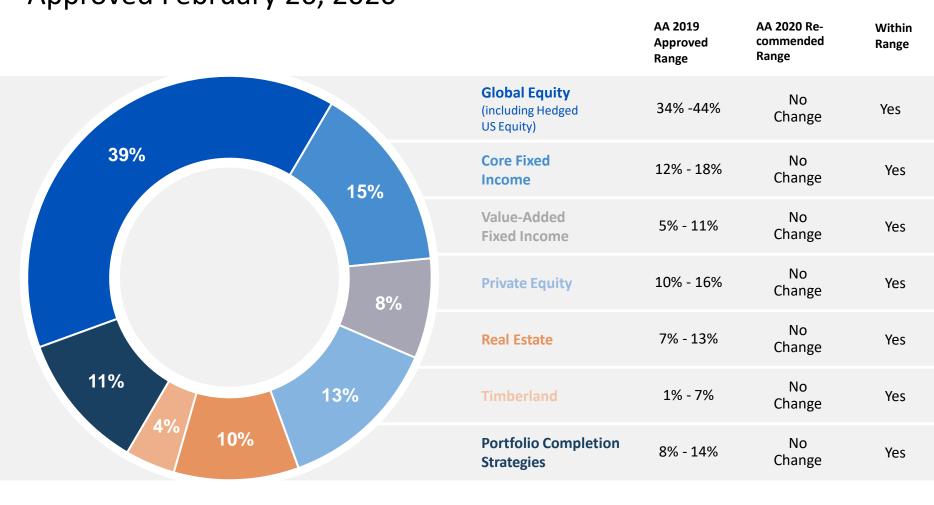
Source: BNY Mellon. Returns as of September 30, 2020.



PRIT FUND ASSET ALLOCATION TARGETS



PRIT Asset Allocation Approved February 26, 2020



The ranges in the PRIM asset allocation reflect the long-standing use of bands around a midpoint. The bands have not changed and any actual weighting within the range is considered acceptable and within the asset allocation policy. Managing the asset allocation to a particular midpoint in the range is not always possible, practical or advisable.

Date Range: Q1 2005 - Q3 2019



Changes to Target Ranges – PRIT Fund Asset Allocation

Approved February 2019

Increase in Allocation Range

Core Fixed Income: Target Band moves up 3%

- The net increase will be funded across the US Treasury curve.
 - US Short-Term Fixed Income **New**
- Within Core Fixed Income, there will be an increase across the US Treasury curve which will be funded through a reduction in Global Inflation-Linked Bonds.

Portfolio Completion Strategies: Target Band moves up 1%

Private Equity: Target Band moves up 1%

Same Allocation Range

Real Estate: Target Band stays the same

• As Private Real Estate deals are sourced, the team may fund from REITS.

Timber: Target Band stays the same

Decrease in Allocation Range

Global Equity:

Target Band moves down 3%

- The decrease will be sourced from Developed International and Emerging Markets Equities.
- Within Global Equities, the increase in the Hedged Equity program will be funded by US and International Equities.

Value Fixed Income: Target Band moves down 2%



PRIM 2020 Asset Allocation Recommendations

NEPC Capital Market Assumptions

		2020 Asset Class Assumptions		2019 Asset Class Assumptions	
Asset Classes	Target Range	10 Yr. Expected Return	30 Yr. Expected Return	5-7 Yr. Expected Return	30 Yr. Expected Return
US Equity ¹		5.2%	6.9%	6.1%	7.6%
International Equities ²		6.1%	7.0%	6.8%	7.8%
Emerging International Equities ²		9.0%	9.2%	9.3%	9.3%
Hedged Equity ³		4.7%	6.2%	5.6%	6.9%
Global Equity	34% - 44%				
Core Bonds		2.5%	3.4%	3.0%	4.4%
Short-Term Fixed Income ⁴		2.5%	3.1%	3.0%	4.0%
20+ Yr. Treasury STRIPS		1.4%	2.5%	1.5%	3.5%
TIPS		2.2%	2.7%	3.0%	4.0%
Core Fixed Income	12% - 18%				
Value-Added Fixed Income ⁵	5% - 11%	5.6%	6.8%	6.7%	7.6%
Private Equity	10% - 16%	9.6%	10.9%	10.0%	11.2%
Real Estate ⁶	7% - 13%	5.3%	6.1%	6.2%	6.4%
Timberland ⁷	1% - 7%	5.9%	6.7%	6.3%	7.0%
Portfolio Completion (PCS) ⁸	8% - 14%	5.1%	5.8%	5.8%	6.8%
Total Fund Expected Return ⁹		6.2%	7.3%	6.8%	7.9%

 $1.\,$ Assumes a 80% allocation to broad market equities and 20% allocation to small cap equities

2. Assumes a 90% allocation to broad market equities and 10% allocation to small cap equities

3. Modeled as 20% US LIBOR, 70% US broad market equities and 10% allocation to small cap equities

4. Modeled as 50% Short-Term Treasury and 50% Short-Term Credit

5. Modeled as 50% High Yield and 50 % Private Debt

6. Real Estate is modelled as 90% Private Real Estate and 10% REITs

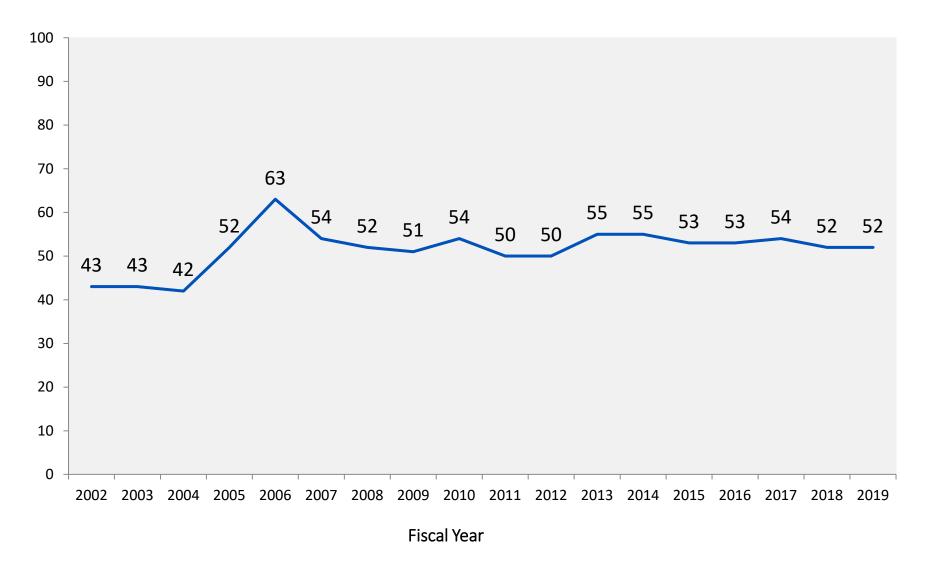
7. Timberland is modeled as Private Real Assets Infrastructure/Land

8. Modeled as equal weighed blend of Hedge Fund Equity, Credit and Macro

9. Asset classes modeled as the midpoint of the asset allocation range



PRIT Fund - Ratio of Expenses in Basis Points





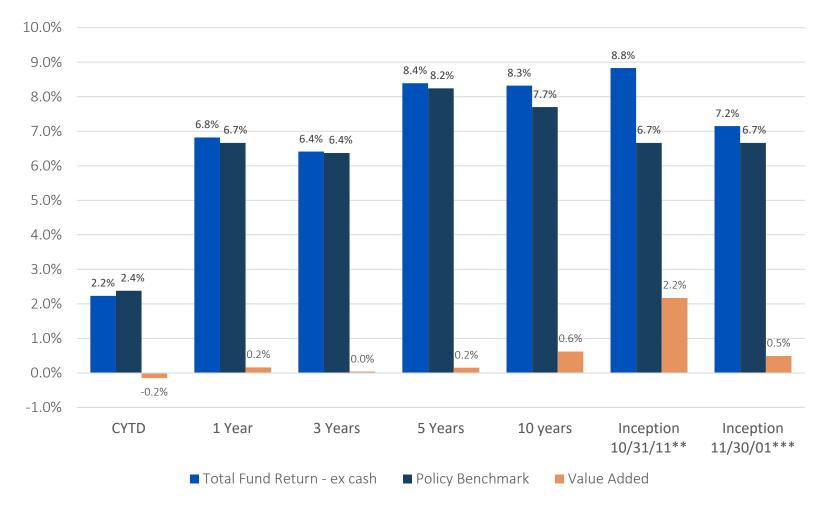
SRBT FUND PERFORMANCE

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Total SRBT Fund Returns

\$2.11 Billion* One Year Ended September 30, 2020 (Net of Fees)



*Participant assets, excluding Mass State Retirees, were \$639 million as of September 30, 2020

** The inception date for the SRBTF's investment in the PRIT Fund General Allocation Account (PRIT GA) was 10/31/2011, when 82% of the fund was transitioned from separate accounts to PRIT GA. The remaining 18% of separate account assets were transitioned over the following 14 months with 100% of assets invested in PRIT GA by 12/31/2012. This ITD value 8.8% reflects the inception-to-date return for PRIT GA assets only.

32 *** The inception date for the TOTAL FUND was 11/30/2001. This ITD value reflects the true inception-to-date return for all SRBTF assets including legacy separate account investments as well as the PRIT GA investments.



MUNICIPAL OUTREACH

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Municipal Outreach

- 1. Acton-Boxborough Regional School District
- 2. Amherst-Pelham Regional School District
- 3. Andover
- 4. Ayer Shirley Regional School District
- 5. Bellingham*
- 6. Belmont
- 7. Bernardston
- 8. Bridgewater
- 9. Byfield Water District
- 10. Cape Cod Regional Transit Authority
- 11. Cape Cod Light Compact (JPE)
- 12. Chelmsford Water District
- 13. Dartmouth
- 14. Dracut
- 15. Freetown
- 16. Foxboro
- 17. Greater Lawrence Sanitary District
- 18. Greenfield
- 19. Groton
- 20. Halifax
- 21. Haverhill
- 22. Hull
- 23. Lawrence
- 24. Longmeadow
- 25. Lynn
- 26. Massachusetts Association of Regional Planning Agencies (MARPA)
- 27. Massachusetts Housing Finance Authority
- 28. Medway
- 29. Melrose
- 30. Mohawk/Hawlemont Regional School District (Buckland)
- 31. Nauset Regional High School
- 32. Newbury

- 33. Pepperell
- 34. Prospect Hill Academy Charter School
- 35. Somerset
- 36. Springfield
- 37. Stoneham
- 38. Sudbury
- 39. Taunton
- 40. Tri-County Educational Collaborative (Franklin, MA)
- 41. Truro
- 42. Waltham
- 43. Watertown
- 44. West Boylston Municipal Light Department
- 45. Westford
- 46. West Newbury
- 47. Weston
- 48. Winthrop
- 49. Woburn
- 50. Worcester*

*New Listing



Governmental Entities Participating in the SRBTF

- 1. Town of Acton
- 2. Town of Amherst
- 3. Town of Ayer
- 4. Town of Bedford
- 5. City of Beverly
- 6. BiCounty Educational Collaborative, Franklin, MA
- 7. Town of Blackstone
- 8. Boston Redevelopment Authority
- 9. Town of Boxford
- 10. Town of Braintree
- 11. Town of Brewster
- 12. Town of Brookline
- 13. Town of Burlington
- 14. Byfield Water District
- 15. Town of Chelmsford
- 16. Concord Area Special Education (CASE) Collaborative
- 17. Town of Cohasset
- 18. Town of Dalton
- 19. Town of Dracut
- 20. Town of Dedham
- 21. Fall River Housing Authority
- 22. City of Fitchburg
- 23. Town of Franklin
- 24. Franklin Regional Council of Governments
- 25. Greater Lowell Regional Technical School

- 26. Town of Harvard
- 27. Town of Hingham
- 28. Town of Holliston
- 29. Town of Ipswich
- 30. Town of Lancaster
- 31. Lawrence Housing Authority
- 32. Town of Lenox
- 33. City of Leominster
- 34. Town of Lincoln
- 35. Lincoln-Sudbury Regional School District
- 36. Town of Longmeadow
- 37. Lowell Regional Transit Authority (LRTA)
- 38. Lower Pioneer Valley Educational Collaborative
- 39. Town of Manchester-By-The-Sea
- 40. Manchester Essex Regional School District
- 41. Town of Marblehead
- 42. Marblehead Municipal Light Department
- 43. Massachusetts School Building Authority
- 44. Mass State Retirees (SRBTF)
- 45. Mass Water Resources Authority
- 46. Town of Medfield
- 47. Town of Middleton
- 48. Town of Milton
- 49. Town of Montague
- 50. Nashoba Regional School District50. Town of Needham

- 51. Town of Needham
- 52. City of New Bedford
- 53. City of Newburyport
- 54. City of Newton
- 55. Town of North Andover
- 56. Town of Northborough
- 57. Town of Northfield
- 58. Old Rochester Regional School District
- 59. Town of Orleans
- 60. Pilgrim Area Collaborative (PAC), Pembroke, MA
- 61. Town of Provincetown
- 62. Quabbin Health District
- 63. Town of Reading
- 64. Shawsheen Valley Technical High School, Billerica, MA
- 65. Town of Sherborn
- 66. South Hadley Fire District
- 67. Town of Stockbridge
- 68. Town of Tewksbury
- 69. Town of Wakefield
- 70. Wakefield Municipal Gas & Light Department
- 71. Town of Wayland
- 72. Town of Wellesley
- 73. Town of Westwood
- 74. Town of Wilmington

Mass

Massachusetts Pension Reserves Investment Management Board 84 State Street, Suite 250 Boston, MA 02109 617-946-8401 www.mapension.com

THANK YOU

CONTACTS

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Francesco Daniele Senior Client Services Officer Office 617-946-8416 E-mail: <u>fdaniele@mapension.com</u>

Emily Green Client Services Analyst Office 617-946-8486 E-mail: <u>egreen@mapension.com</u>