PRIM Board Quarterly Update SECOND QUARTER 2020

Markets Overview and PRIT Fund Performance Summary

PRIM Executive Director and Chief Investor Officer Michael G. Trotsky, CFA provided the following information to the PRIM Board at its September 9, 2020, meeting:

Executive Director and Chief Investment Officer Report

During fiscal year 2020 (FY2020) the PRIT Fund net asset value grew \$1.5 billion (2.38% gross, 2.0%, net of fees) to \$75 billion and paid out \$1.3 billion in benefits to retirees despite a very difficult, volatile, and uncertain investment environment. The COVID-19 pandemic led to the sharpest sell-off in history when the S&P 500 fell 34 percent in 20 days in March. Since the March lows, the market has staged the fastest-ever recovery from a major correction, increasing nearly 60% in five months, despite significant global economic challenges, heightened geopolitical tensions, political discord, and social unrest. We believe the pandemic has caused severe economic damage, and the challenges the economy faces in restarting are enormous; it will likely take a long time to fully recover. In the meantime, we expect more volatility. Still, we are confident that the carefully constructed, broadly diversified PRIT Fund will continue to perform well over the long term as it has consistently performed strongly in both up, and perhaps more importantly, down markets.

Following guidance from the Governor, Treasurer, and other officials, the PRIM offices were shut down for more than three months starting in mid-March 2020 and during that time all staff was able to work remotely without difficulty. PRIM offices reopened on Monday, June 29th and staff was encouraged to adopt a return approach that worked for their personal circumstances. Returning to the office is entirely voluntary, and I am very pleased that approximately 30 to 40% of our employees (15 to 20) are back in the office each day.

The reopening was made possible by the Governor's directives and guidance in consultation with the Treasurer and her staff. The operations team at PRIM studied the guidance and protocols thoroughly and determined that our office configuration and size allow us to adhere completely to the safety and health protocols. We also have the added benefit of being on the second and third floors, which greatly reduces the need to use the elevators.

While the health and safety of our staff and their families is our number one priority, we are also committed to safely and gradually welcoming more employees to our offices as the guidance allows. I believe opening is an important step in optimizing our productivity, maintaining our collaborative culture, and encouraging innovation and efficiency at PRIM. I could not be prouder of how our teams at PRIM performed through all the challenges of this difficult situation.

Of special note, in mid-March, a PRIM employee was diagnosed with COVID-19, but I am pleased to report that the employee has recovered and is back at work. We are very thankful for this wonderful outcome.

Organizationally, FY2020 was another outstanding year. Consistent with the Board-approved hiring plans, we filled nine staff vacancies with top talent (all diverse), and only one senior-level employee departed (none in FY2019). We also welcomed eight new interns during the fiscal year; all were diverse. We have exceptional investment, finance, and operations professionals here at PRIM, and our job postings attract hundreds of talented, well-qualified applicants. Our team continues to be recognized nationally for the success and innovation of our investment program and for the transparency and completeness of our financial reporting. Our comparatively small staff researched and deployed approximately \$5.4 billion in new Board-approved investments in FY 2020 – admirable productivity in what has been a challenging year.



In the area of national recognition, I am very happy to report that in July, the American Investment Council announced that PRIM Private Equity ranked #2 in private equity returns among 176 U.S. public pension funds based on 10-year performance. PRIM is the only fund that has been in the top five of all private equity portfolios every year the American Investment Council has conducted the study – including #1 rankings in 2019, 2018, 2015, and 2013. We are extremely proud of this accomplishment. The 10-year performance of our private equity portfolio was 16.4% net of fees and was only 30 basis points behind the #1 ranked fund in the country. Private Equity is an important return driver at PRIM and is PRIM's highest performing asset class by more than 5% annualized.

Markets and PRIT Fund Performance Summary

The market correction in March 2020, when equities fell 34% in 20 days, was the fastest on record going back to the Great Depression, but it was not the deepest. The deepest correction in history was during the Great Depression when stocks fell 86% over 34 months. The March 2020 market correction lasted only 20 days, not 20 months, which is the average of the 14 major corrections since the Great Depression. The March correction was unusually sharp and steep, and the rebound, the bounce off the bottom, was also exceptionally fast and steep. Since the lows on March 23rd, the S&P is up 58%, to record levels. In just five months there has been a complete reversal— a 90% swing — down 34% from mid-February to mid-March, and up 58% since the lows on March 23rd.

A 90% swing in a short period and extreme market volatility is difficult to navigate. As a result of our strategic, long-term asset allocation studies, we have gradually decreased the PRIT Fund's exposure to equities from a midpoint of 50% five years ago to 39% today. Lower exposure to equities contributed to our relatively strong performance in the March quarter, but the lower exposure to equities was a headwind in the June quarter when equities soared. For the fiscal year, PRIM's Core Fixed Income portfolio returned nearly 14%, providing downside protection when we needed it. An essential component of Core Fixed Income is the U.S. Treasury STRIPs position – long-duration Treasuries – that returned more than 35% in FY2020, making it the top performer for the fiscal year. PRIM's second-best performing asset class was Private Equity, which returned 4.4% for the fiscal year. Notably, the PRIT Fund continues to have no liquidity issues – we are fully able to meet our benefit obligations.

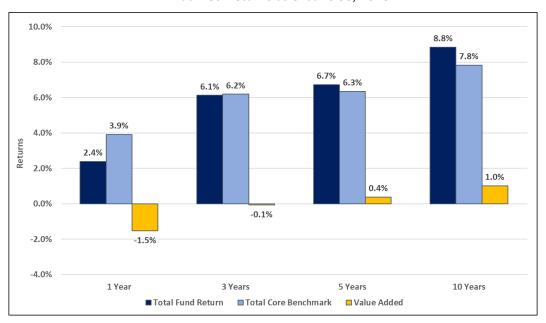
Ironically, while PRIM's Private Equity portfolio is garnering national recognition and continues to be our best performing asset class over the long-term, and the second best performer in the fiscal year, it is also the primary reason the PRIT Fund underperformed its benchmark by approximately 150 basis points in the fiscal year. The relative underperformance was due almost entirely to a private equity benchmarking anomaly in the June quarter. It is in no way indicative of the underlying strength of our Private Equity portfolio, but these anomalies happen from time to time and are exaggerated during periods of extreme volatility. The Private Equity 1-year performance (4.4%) is compared to a long-term, 7-year average public markets benchmark (14.3%), in a period when public markets have been strong. This comparison is a mismatch in time periods. If we were to compare similar time periods, the 7-year average return of the PRIM PE portfolio of 18.8% to the 7-year average return of the benchmark (14.3%), the PRIT Fund outperformed by more than 4%. Comparing short-term performance (1-year) to a longer-term benchmark (7-year average) can result in dramatic differences, especially during volatile markets, which occurred during this reporting period. We expect this phenomenon to reverse over time, just as it did during the Global Financial Crisis in 2008/2009, when the PRIT Fund last exhibited the same benchmarking anomaly.

Based on early reports, we are optimistic that in September, private equity performance will rebound faster than we expected when we reported the June performance. In fact, we expect the June quarter gains may more than offset the March quarter decline, and we are now more confident that the benchmarking anomaly, which impacted relative performance last quarter, will reverse materially this quarter.



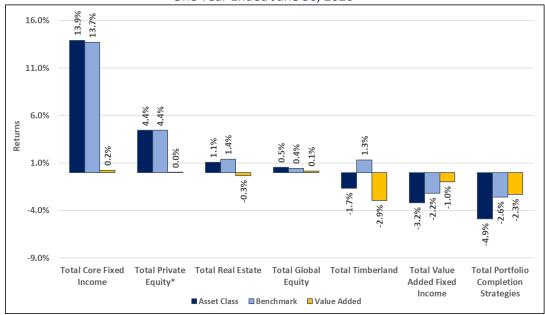
Total PRIT Fund Returns (Gross of Fees)

Annualized Returns as of June 30, 2020



PRIT Asset Class Performance (Gross of Fees)

One Year Ended June 30, 2020



^{*}Benchmark is actual performance



PRIT Fund Periodic Table of Returns (Gross of Fees)

Years Ended June 30, 2020

1 Year	3 Year	5 Year	10 Year
CORE FIXED INCOME 13.9%	PRIVATE EQUITY	PRIVATE EQUITY	PRIVATE EQUITY
	14.7%	15.4%	16.9%
PRIVATE EQUITY	CORE FIXED INCOME 7.8%	REAL ESTATE	REAL ESTATE
4.4%		7.0%	10.3%
REAL ESTATE	GLOBAL EQUITY	CORE FIXED INCOME	GLOBAL EQUITY
1.1%	5.5%	6.5%	9.5%
GLOBAL EQUITY	REAL ESTATE	GLOBAL EQUITY	CORE FIXED INCOME 5.6%
0.5%	5.5%	6.4%	
TIMBER (1.7%)	TIMBER 2.6%	VALUE-ADDED FIXED INCOME 3.6%	VALUE-ADDED FIXED INCOME 5.3%
VALUE-ADDED FIXED INCOME (3.2%)	VALUE-ADDED FIXED INCOME 2.3%	TIMBER 3.3%	TIMBER 4.9%
PORTFOLIO	PORTFOLIO	PORTFOLIO	PORTFOLIO
COMPLETION	COMPLETION	COMPLETION	COMPLETION
STRATEGIES	STRATEGIES	STRATEGIES	STRATEGIES
(4.9%)	1.1%	1.3%	3.8%

Research Update

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

In September, PRIM and MIT Sloan School of Management announced a groundbreaking collaboration that seeks to create more reliable and transparent ESG data and benchmarks for investors. As the founding member, PRIM will partner with the MIT Sloan Sustainability Initiative on this innovative project to reinvigorate research to improve ESG data. As part of this collaboration, PRIM will be at the vanguard of a rigorous, more robust approach to sustainable investing, and will have access to MIT Sloan's leading sustainability researchers and early access to exclusive findings. Dr. Roberto Rigobon and Dr. Jason Jay from the MIT Sloan Sustainability Initiative provided a brief overview of their research focus and the goals of the project. Dr. Rigobon is a Professor of Applied Economics at the MIT Sloan School of Management, and a member of MIT Sloan School of Management's Aggregate Confusion, Environmental, Social & Governance ('ESG') initiative. Dr. Jay is a Senior Lecturer and Director of the MIT Sloan Sustainability Initiative. Both have helped secure MIT Sloan's position as a leader in the field of sustainable investing through teaching, research, and industry engagement.

"Working with Mass PRIM will significantly advance the Aggregate Confusion Project," said Jason Jay, "Pension funds like PRIM have a unique vantage point on the challenges of integrating ESG into the investment process, and the importance of solving the measurement problem. They can help inform our research questions and methodology and be a testbed for innovative approaches."



"We are very excited to partner with MIT Sloan on this project," said Michael G. Trotsky, CFA. "As an investor, the discrepancies in ratings from agency to agency makes evaluating a company's ESG impact extremely challenging. We hope that this project will reinvigorate the debate on how to improve those ratings, and we're looking forward to being a part of the membership council, which will collaborate on implementation strategies."

Fiscal Year 2020 Highlights

Consistent with last year, Michael G. Trotsky, CFA, created a list of PRIM's top 20 highlights from fiscal year 2020:

- 1. In very difficult and volatile investment environment, the PRIT Fund still outperformed many of our peers in FY2020 with a return of 2.4% and the fund asset value grew \$1.5 billion.
- 2. We met all our obligations and paid out \$1.3 billion in benefits to retirees.
- The investment team, with operations staff support, researched and deployed approximately \$5.4 billion in Board-approved investments in FY2020. Great productivity for our comparatively small staff.
- 4. We created a diversity, equity, and inclusion framework to execute PRIM's diversity and inclusion initiatives (recruitment, retention, procurement, training, etc.) and we made significant, measurable progress in the year.
- 5. All nine new full-time employees and all 8 interns in FY2020 were diverse regarding gender, race, or both.
- PRIM invested approximately \$1.3 billion with 10 minority and/or women-owned investment managers during FY2020. The PRIT Fund currently invests nearly \$4 billion with women or minority-owned investment managers.
- 7. We made significant progress on improving PRIM's staff diversity. Today 61% of PRIM's workforce is diverse in regard to gender, race, or both, 52% of PRIM's workforce is female, 33% of PRIM's Senior Management is diverse in regard to gender, race, or both and 28% of PRIM's Senior Management is female. There is room to improve, but we are making good progress.
- 8. In Public Markets, we deployed \$1.5 billion in U.S. Short-Term Fixed Income, a new asset class. That was timely.
- 9. Allocated \$450 million in Other Credit Opportunities, including an investment that utilizes the newly created TALF program -capitalizing on the market dislocation.
- 10. In Private Equity, made commitments to 14 funds totaling \$1.6 billion; two of the 14 funds are new managers to PRIM.
- 11. Made 10 co-investments totaling \$210 million, an 25% increase from FY 2019.
- 12. In Portfolio Completion Strategies (PCS), added four new managers to the PCS platform and one new manager to the Other Credit Opportunities (OCO) platform.
- 13. In Research completed the ESG Board Educational Primer and developed a groundbreaking academic partnership with the MIT Sustainability Initiative.
- 14. In Real Estate and Timberland, closed seven core real estate acquisitions \$435 million. Closed five core real estate dispositions totaling \$294 million. Refinanced \$200 million of real estate portfolio debt. Closed 2 non-core commitments high technology and life science office strategy –\$200 million another Industrial Development Project (Atlanta) \$21 million.
- 15. In Finance, and Operations, PRIM awarded GFOA Certificate of Achievement for Excellence in Financial Reporting (15th consecutive year).
- 16. Successfully transitioned to a completely remote workforce in response to COVID-19. And successfully created and implemented a workforce re-entry plan in response to COVID-19.
- 17. Completed multiple audits conducted by KPMG with no (adverse) findings.
- 18. In Client Services, no clients were lost in fiscal year 2020 and the MBTA Retirement Fund Board

- voted to invest \$45 million in PRIM Hedge Funds and Private Equity.
- 19. Received national recognition for PRIM and its staff members.
- 20. In Project SAVE, completed nine new Private Equity co-investments totaling \$174 million and the Project SAVE (Phase I) initiative realized approximately \$187 million in annualized value.

PRIM Board Actions – September 9, 2020

At its September 9, 2020 meeting the PRIM Board approved the following recommendations of the Investment Committee, the Real Estate & Timberland Committee, and PRIM Staff:

Private Equity

Follow-on Investment Recommendation

PRIM staff and the Investment Committee recommend (unanimously) to the PRIM Board that the Board approve a commitment of up to \$200 million to Technology Crossover Ventures XI, L.P. ("TCV XI" or "Fund XI"). Since 2006, PRIM has invested in five prior Technology Crossover Ventures funds. Technology Crossover Ventures is one of the world's largest fund sponsors focused entirely on technology investments. The firm employs over 60 investment professionals with offices in Menlo Park, New York, and London. Fund XI will target minority equity positions in high growth private and public technology companies in the U.S. and Western Europe. Each of the TCV funds in which PRIM invested is in the first or second quartiles in industry peer performance rankings.

Technology Crossover Ventures XI, L.P. is a private equity fund established by Technology Crossover Ventures (TCV) to make growth equity investments in high growth technology companies. TCV XI will total \$3.25 billion in aggregate commitments and will acquire minority equity positions in private and public technology companies.

Request for Proposals (RFP) for Private Equity Advisory Services Recommendation

PRIM staff and the Investment Committee recommend (unanimously) to the PRIM Board that the Board approve the selection of the incumbent, Hamilton Lane, to provide private equity advisory services to PRIM.

Finance & Administration Report

PRIM's Director of Human Resources, Michelle Witkes, and PRIM's Chief Operating Officer, Tony Falzone, provided the Board with an update on PRIM's Diversity, Equity and Inclusion efforts. A copy of the report is available upon request to clientservice@mapension.com.

Other PRIM Developments

GIPS Compliance

In August, PRIM's Chief Investment Operating Officer, Matt Liposky, reported that for the third consecutive year, PRIM completed its FY2020 Global Investment Performance Standards (GIPS®) verification with no issues. The report is included in the e-mail containing this newsletter and the August 2020 participant statements. PRIM is one of only a handful of large public pension plans to comply with the GIPS standards. The GIPS standards are administered by CFA Institute, the global association of more than 159,000 investment professionals that awards the Chartered Financial Analyst designation.



The Client Services team -- Paul Todisco, Francesco Daniele, and Emily Green – will continue to meet with the retirement boards of PRIM's member retirement systems throughout the year. To schedule a visit, please contact Paul at ptodisco@mapension.com, Francesco at fdaniele@mapension.com, Emily at egreen@mapension.com, or call 617-946-8401. We look forward to seeing you soon.