PRIM Board Quarterly Update Fourth Quarter 2021

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PRIM Executive Director and Chief Investment Officer Michael G. Trotsky, CFA provided the following information to the PRIM Board at its February 17, 2022, meeting:

Executive Director and Chief Investment Officer Report

The December quarterly results, up 5.4% net and 1.4% above benchmark, capped another outstanding and record-setting year. For the calendar year ending December 31, 2021, the PRIT Fund was up 20.6% gross or 20.1% net of all fees; that was the fourth largest return in PRIM's entire history. The fund ended the year at a record \$104 billion. The 2021 return outperformed the benchmark by more than 8% net of fees, or \$7 billion, the strongest outperformance in our entire history, surpassing the previous record of 4% outperformance set in 1999. Our return for the year was in the very top decile of our peer group.

Private Equity, Real Estate, and Global equities had very strong returns. Private Equity up 64%, Real Estate up 27%, and Global Equities up 18%, while Fixed Income was essentially flat, net of fees, for the year. We would expect this result for bonds in a rising interest rate environment. All asset classes outperformed their respective benchmarks for the year and during this challenging year, the PRIM staff remained very productive, deploying more than \$7.6 billion in new investments, another record.

The longer-term results also strengthened. The 3-, 5-, and 10-year PRIT Fund returns of 16.1%, 12.4%, and 10.5%, are well above benchmark and the state's actuarial rate of return, which is currently 7% and well above our long-term average returns. These results - all time periods - are also at the top of our peer group. We are proud that over the past 10 years, the investment gain totaled \$70.6 billion and was \$12 billion above a benchmark return. We believe this is an indication that our staff and our managers are adding significant value for our fund's 300,000+ beneficiaries and for the Massachusetts taxpayers. In fact, we have a saying around the halls of PRIM: to the extent PRIM is successful, we are the taxpayers' friend – not to mention the retirees' friend. We are proud that we have added more than \$70 billion to the pension fund and outperformed our benchmark by more than \$12 billion over the last decade. It has been an extremely gratifying body of work.

We want to stop short of making any projections about the future, but we do believe a word of caution is in order because it is part of our job to set realistic expectations. We offer this with the appropriate amount of humility; please remember our core investment philosophies: 1) nobody can predict the future, so we don't try, and 2) nobody can predict the direction of the markets, so we don't try. Instead, we engineer a portfolio with components that will perform well in a variety of market environments.

It would be unreasonable to assume that the returns over the next 10 years can be as impressive as the last 10 years for two primary reasons: 1) markets have appreciated far more quickly than the underlying growth of the economy, and that cannot last indefinitely, and 2) we are exiting a 30-year investing environment with the dominant backdrop of falling interest rates and loose monetary policy and entering an environment where interest rates and inflation are now rising, monetary policy is tightening, and labor markets and population growth are falling. It seems like a regime change, but only time can confirm that.

We look forward to the Board taking up the Treasurer's plan to both create an ESG Committee and adopt a new climate change related proxy voting policy. The Treasurer is passionate about each of these important and timely topics with the goal to keep PRIM out in front of major trends in the industry.

We believe the new committee will build on the important work we have been doing over the years internally and with our partners in the MIT Sloan School's Aggregate Confusion Project to become more impactful; to use the power of PRIM to advocate for important change. Our job, and we know the Treasurer shares our view, is to ensure that we become more impactful while also maintaining or improving the Fund's historically strong return, risk, and cost profile. Only a fully funded pension system can guarantee retirement security for our 300,000 beneficiaries; their future, their retirements, their golden years, depend on PRIM's investment success. The taxpayer of Massachusetts also relies on PRIM's continued investment success.

Markets

With 2021 results in the rear-view mirror, volatility has returned, and returns have been negative so far in 2022. The S&P is down approximately 6% for the year, developed international markets are down 3.6%, and emerging markets are flat. Diversified bonds are down 4.6% as interest rates continue to rise. The ten-year Treasury Bond Markets are yielding more than 2%, a multi-year high (May 2019). The markets have struggled with the Omicron surge, labor shortages, supply chain shortages, and an associated 40-year high inflation reading of 7.5% in January, not to mention continued geopolitical tensions as well as our own domestic tensions. Market volatility as measured by the VIX surged from 17.2 at the beginning of the year, to an intraday high of 36 in January, well above its average. The Federal Reserve left the target range for its federal funds rate unchanged for now at 0-0.25% during its January meeting. However, they indicated a desire to raise the target range beginning in March as inflation is currently running well above 2.0% and the labor market is very strong; the unemployment rate was reported at a mere 3.9% recently. Market futures are indicating that the Fed will raise rates four or five times in 2022. The prospect of an increasingly hawkish Fed, combined with some mixed economic data likely caused by the Omicron spike, and some softening of corporate earnings is alarming to market participants.

PRIT Fund Performance

For the one-year ended December 31, 2021, the PRIT Fund was up 20.6%, (20.1% net), outperforming the total core benchmark of 12.0% by 862 basis points (812 bps net).

- This performance equates to an investment gain of \$17.4 billion, net of fees.
- This outperformance equates to \$7.0 billion of value above the benchmark return, net of fees.
- Net total inflows from contributions for the one-year ended December 31, 2021, were approximately \$21 million.



The following charts summarize the PRIT Fund performance for the calendar year ended December 31, 2021.



Total PRIT Fund Returns

(Gross of Fees) Annualized Returns as of December 31, 2021

Source: BNY Mellon. Totals may not add due to rounding. Total Core Benchmark includes private equity benchmark.

PRIT Performance by Asset Class



(Gross of Fees) Annualized Returns as of December 31, 2021

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

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PRIT Fund Annualized Returns By Asset Class

(Gross of Fees) as of December 31, 2021

1 Year	3 Year	5 Year	10 Year
PRIVATE EQUITY	PRIVATE EQUITY	PRIVATE EQUITY	PRIVATE EQUITY
66.2%	33.2%	29.6%	23.4%
REAL ESTATE	GLOBAL EQUITY	GLOBAL EQUITY	GLOBAL EQUITY
28.1%	20.7%	14.7%	12.3%
GLOBAL EQUITY	REAL ESTATE	REAL ESTATE	REAL ESTATE
19.2%	12.9%	10.6%	11.2%
TIMBER 11.6%	VALUE-ADDED FIXED INCOME 8.5%	VALUE-ADDED FIXED INCOME 7.2%	VALUE-ADDED FIXED INCOME 6.2%
VALUE-ADDED FIXED INCOME 11.5%	CORE FIXED INCOME 7.7%	CORE FIXED INCOME 5.5%	TIMBER 6.0%
PCS	PCS	TIMBER	PCS
8.8%	5.7%	5.3%	5.1%
CORE FIXED INCOME	TIMBER	PCS	CORE FIXED INCOME
0.2%	5.2%	4.6%	4.7%

Source: BNY Mellon.

Organizational Updates

New Employee

Renee LeFevre joined in January as PRIM's Chief Legal Officer. She will also serve on our executive management team and will report directly to Michael Trotsky. Renee joins PRIM from the Boston Planning and Development Agency (BPDA), which is made up of the Boston Redevelopment Authority, Economic Development Industrial Corporation of Boston, and the Mayor's Office of Workforce Development. Renee was with the agency since 2000 and became General Counsel in December 2014. At BPDA, Renee managed a 10-person legal department and outside counsel handling all legal issues including compliance on open meeting laws, public records requests, ethics, conflicts of interest and disclosures under Massachusetts General Laws. She also was responsible for legal matters pertaining to development proposals, public hearings, disposition of property, procurement, budget, personnel, and more.

Renee's professional associations include serving as Vice President on the Board of Directors for the Boston Local Development Corporation (BLDC), member of The Abstract Club, CREW (Commercial Real Estate Women Network Boston), and the Boston Bar Association. Renee is a recipient of GET Konnected 50 Most Influential Attorneys of Color and the Henry L. Shattuck Public Service Award. Renee is a graduate of the University of California at Berkeley and Boston College Law School.

Intern

Charlotte Wang, joined the PCS team as an intern reporting to Bill Li, PRIM's Director of Portfolio Completion Strategies. She is currently a senior at Brandeis University majoring in Mathematics and Economics. Because of her academic excellence, Brandeis has slotted her into a fast-track master's program at their International Business school.



Recent Recognition

Jennifer Cole, PRIM's Manager of Client Reporting and Cash Management, recently celebrated 20 years at PRIM. Jennifer joined PRIM in 2002 as a Staff Accountant and over the years was promoted to Financial Analyst, Senior Financial Analyst and then Manager of Client Reporting and Cash Management. Jennifer is responsible for managing all cash needs for all PRIM clients. She handles all contribution and redemption activity, ensuring these transactions are processed correctly, and she plays a critical role in processing all PRIT Fund purchase and sale transactions on the first business day of every month. Jennifer has helped plan and manage PRIM's successful client conferences, she always delivers the highest level of customer service to our clients, our Operations team, and our entire organization. Jennifer is highly regarded by clients and colleagues who often commend her work ethic, accuracy, professionalism, and dedication.

Liu Liu, Investment Analyst on the Portfolio Completion Strategies team, has recently earned both the CFA and CAIA charters after passing each of the rigorous multi-year exams and also after accumulating the requisite work experience. In her work at PRIM, Liu has enhanced our portfolio analytics. She is responsible for the hedge fund replication program, which has been a consistent outperformer, as well as China equity strategies. Liu joined PRIM in September 2018 on a permanent basis as an Investment Analyst after spending 18 months as an intern working in PRIM's Strategy team. Liu received her master's degree in finance from the Brandeis International Business School and earned her bachelor's degree in finance from Shanghai Jiao Tong University in China.

PRIM Board Actions

Private Equity

Follow-on Investment Recommendation: Thoma Bravo XV, L.P., Thoma Bravo Discover IV, L.P., and Thoma Bravo Explore II, L.P.

The PRIM Board approved a commitment of up to \$275 million to Thoma Bravo Fund XV, L.P. ("Fund XV"), up to \$150 million to Thoma Bravo Discover Fund IV, L.P. ("Discover Fund IV"), and up to \$150 million to Thoma Bravo Explore Fund II, L.P. ("Explore Fund II"). PRIM has invested in fourteen prior Thoma Bravo, LLC ("Thoma Bravo") funds since 2000. Thoma Bravo is a sector specialist private equity group focusing on investing in businesses that provide application, infrastructure, or security software products or technology enabled services.

Follow-on Investment Recommendation: Chequers XVIII, SLP.

The PRIM Board approved a commitment of up to €80 million to Chequers Capital XVIII, SLP. ("Fund XVIII" or "Chequers XVIII"). Chequers will target lower middle market buyouts primarily in France, Italy, and Germany in the asset light industrials and B2B services and distribution sectors. PRIM has invested in three prior Chequers Capital ("Chequers") funds. Chequers is led by nine senior investment professionals with an average tenure of 16 years at the firm.

Follow-on Investment Recommendation: Polaris Growth II, L.P.

The PRIM Board approved a commitment of up to \$40 million to Polaris Growth Fund II, L.P. ("Fund II" or "Growth Fund II"). In 2018, PRIM made its first investment in Polaris Growth Fund I, the firm's first dedicated growth stage fund led by Bryce Youngren, who had led this strategy within the Polaris Venture Funds for 16 years. Fund II will continue to target buyouts of lower middle-market software and technology enabled services companies in North America.

Follow-on Investment Recommendation: JMI Equity Fund XI, L.P.

The PRIM Board approved a commitment of up to \$100 million to JMI Equity Fund XI, L.P. ("Fund XI" or "JMI XI"). JMI will target growth-stage North America-based companies that provide software and



technology-enabled services. PRIM has invested in two prior JMI Equity ("JMI") funds. JMI is led by nine senior investment professionals with an average tenure of 17 years at the firm.

Follow-on Investment Recommendation: Advent GPE X. L.P.

The PRIM Board approved a commitment of up to \$350 million to Advent International GPE X, L.P. ("GPE X" or "Fund X"). PRIM has invested in eight prior Advent International ("Advent") funds since 1989. Advent's senior team has worked together for an average of 14 years. Advent Global Private Equity ("GPE") funds target buyouts in North America, Europe, and Asia in the Business & Financial Services; Healthcare; Industrial; Retail, Consumer & Leisure; and Technology sectors.

Follow-on Investment Recommendation: USV 2022, L.P. and USV Opportunity 2022 L.P.

The PRIM Board approved a commitment of up to \$22 million to USV 2022, L.P. ("USV 2022") and up to \$32 million to USV Opportunity 2022, L.P. ("Opportunity 2022"). PRIM has invested in eleven prior Union Square Ventures ("USV") funds since 2004. USV's senior team has worked together for over eleven years. USV makes seed, early- and late-stage venture capital investments in technology companies.

Commitment Summary

PRIM Private Equity 2021 Investment Summary (in millions)		
Partnership	PRIT Commitment	
Approved at the February 24th Board Meeting		
JMI Equity Fund X*	\$80	
Thomas H. Lee Equity Fund IX*	\$200	
Approved at the May 26th Board Meeting		
Hellman & Friedman Capital Partners X*	\$350	
TA Associates XIV*	\$335	
TA Select Opportunities Fund II*	\$100	
Providence Strategic Growth V*	\$175	
Insight Venture Partners XII*	\$150	
Insight Partners XII Buyout Annex Fund*	\$50	
Insight Partners Fund X Follow-on Fund*	\$75	
Quad-C Partners X*	\$150	
Thompson Street Fund VI*	\$150	
Flagship Pioneering Fund VII*	\$30	
Approved as Interim Recommendations on June 15th		
Nordic Capital Evolution Fund*	\$94 (€80 <u>)</u>	
Index Ventures XI*	\$20	
Index Ventures Growth VI*	\$50	
Approved at the August 17 th Board Meeting		
Tidemark Fund I, L.P.	\$75	
Trident IX, L.P.*	\$150	
Approved at the December 2 nd Board Meeting		
Georgian Alignment Fund II, L.P.*	\$50	
Georgian Growth Fud VI, L.P.*	\$100	
GTCR Strategic Growth Fund*	\$100	
Spark Capital Fund VII, L.P.*	\$14	
Spark Capital Growth Fund IV. L.P.*	\$28	
Total	\$2,432	
2021 Investment Plan	\$2,100 - \$2,700	



Strategy Group

Research - Asset Allocation Recommendation

The PRIM Board approved the 2022 asset allocation recommendation. The 2022 asset allocation recommendation represents no major changes to the prior year's recommendation. It includes a 1% increase in the Private Equity target range and a 1% decrease in the Global Equities target range.

Finance and Administration

Proxy Voting Guidelines

The PRIM Board approved the 2022 enhancements to PRIM's Custom Proxy Voting Guidelines proposed by Treasurer Deborah B. Goldberg. The proposed climate change related enhancement is as follows:

Sustainability and Climate Change

• Climate Change/Greenhouse Gas Emissions

Vote AGAINST directors at companies targeted by the Climate Action 100+, and vote CASE-BY-CASE on directors at companies not included on the Climate Action 100+ action list, that have failed to align their business plans with the goals of limiting global warming to 1.5 degrees Celsius, as set forth in the Paris Climate Agreement, and/or that have failed to establish a plan to achieve net zero emissions by 2050.

Environmental, Social and Governance (ESG) Update

The PRIM Board approved the recommendation that the Board establish an Environmental, Social, and Governance (ESG) Committee, for the purpose of advising the Board on ESG-related matters and to engage Funston Advisory Services LLC, on a limited scope engagement, to assist with developing a proposal for the ESG Committee's structure and charter.

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

