

# PRIM Board Quarterly Update

## FOURTH QUARTER 2017

### 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 February 15, 2018, meeting:*

#### MARKETS OVERVIEW

The final quarter of 2017 was strong, and it capped an outstanding year in the financial markets. In 2017, domestic equities rose 21.8%, developed international equities rose 25%, and emerging markets equities rose 37.3%. The moderate improvement in global economic indicators during the year failed to produce a corresponding increase in interest rates and inflation, and as such, diversified bonds rose 3.5% and long duration bonds rose 13.7%.

While global economic indicators have improved, we still monitor several risks in the market, many we first identified more than a year ago. The economic cycle is more than nine years old and there are many uncertainties ahead – the impact of tax reform, the debt ceiling, federal budget appropriations, North Korea, immigration reform, currency manipulation, tariffs and trade agreements, to name a few. We believe that our carefully constructed, diversified portfolio is appropriate for this environment and we are very proud of our strong performance in 2017 even while, for the last five-plus years, we have systematically de-risked our portfolio.

The asset allocation recommendations approved by the Investment Committee in January are a modest evolution of the path we have been on for the past several years and our top core beliefs that guide our investment decisions are as follows (more on asset allocation to follow):

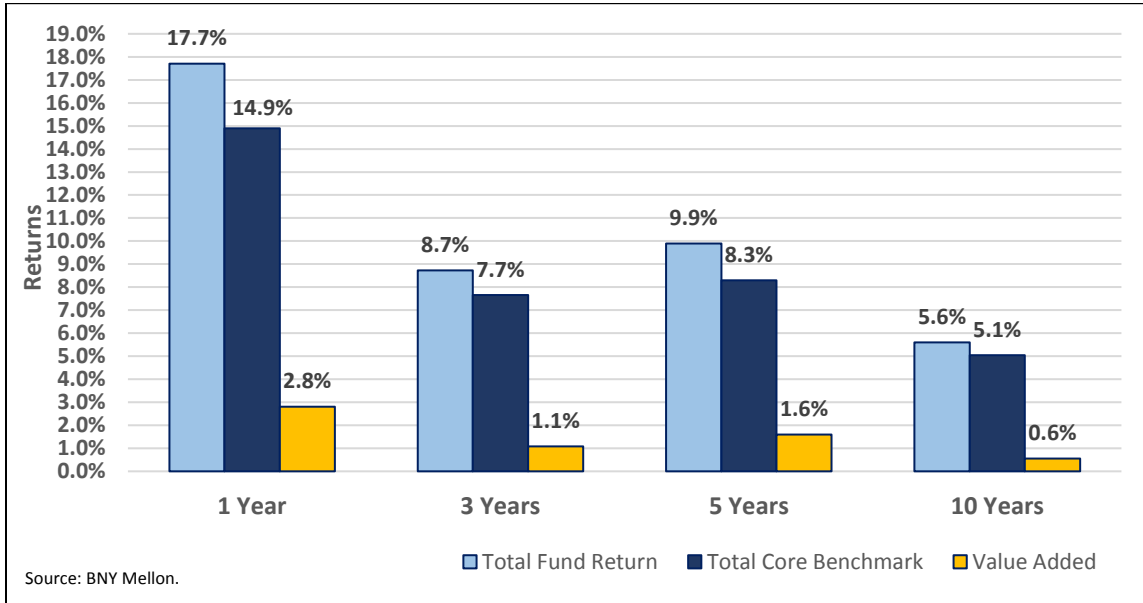
1. We are guided by our mandated rate of return, the actuarial rate of return, which currently is 7.5%. That makes it necessary to have a relatively aggressive portfolio with significant equity risk.
2. We make sure that every active manager we hire has skill, and we have developed tools to identify managers with skill. We only pay active fees for managers with skill – an attractive manager will produce strong returns that cannot be explained by persistent factor tilts.
3. We believe that any investment must be evaluated on three equally important parameters: risk, return and cost. Too often, especially in years like we just had, investors are focused more on return than they are on risk and cost.
4. We value a basis point of cost reduction more than a basis point of return. Why? We can count on cost savings every year, but nobody ever really knows what the markets will deliver.
5. Nobody can predict the future, so we don't try.
6. Nobody can predict the stock market, so we don't try.
7. Every strategic decision we make on asset allocation complies with our "do no harm" rule. We try to find assets or strategies that improve the risk/return profile of the entire fund.

#### PRIT FUND PERFORMANCE SUMMARY

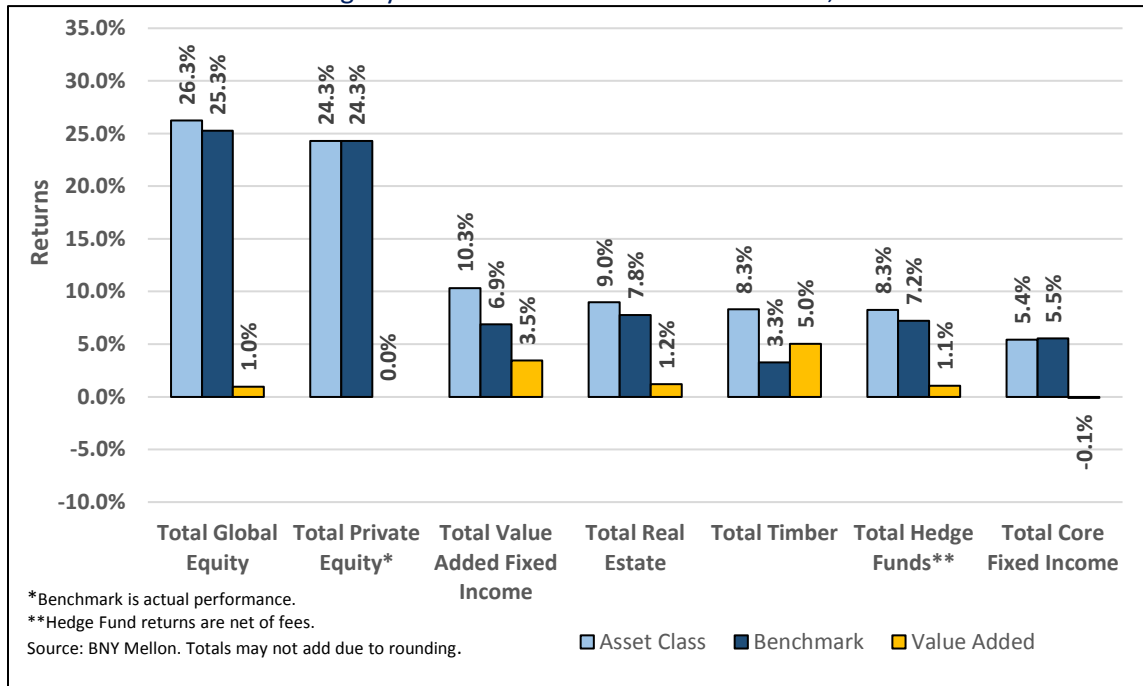
As of December 31, 2017, the PRIT Fund net asset value stood at \$71.9 billion. For the one-year ended December 31, 2017, the PRIT Fund rose 17.7% gross (17.2% net), outperforming the total core benchmark of 14.9% by 281 basis points (232 bps net).

- This performance equates to an investment gain of \$10.8 billion, net of fees.
- This outperformance equates to \$1.4 billion of value above the benchmark return, net of fees.
- Six of the seven major asset classes outperformed their respective benchmarks.
- Net total outflows to pay benefits for the one-year ended December 31, 2017, were approximately \$1.4 billion.

**Total PRIT Fund Returns (Gross of Fees)**  
Annualized Returns as of December 31, 2017



**PRIT Asset Class Performance (Gross of Fees)**  
Trailing 1-year Performance as of December 31, 2017



**PRIT Core Fund Performance Summary (Gross of Fees)**

Trailing 1-Year Performance as of December 31, 2017

Trailing 1-Year Performance: Dec. 31, 2017	Return	Benchmark Return	Over/(Under) Benchmark (bps)	\$Value (millions)	% of PRIT Fund
<b>Total PRIT Fund</b>	<b>17.7%</b>	<b>14.9%</b>	<b>281</b>	<b>71,894</b>	<b>100%</b>
<b>Total Global Equity</b>	<b>26.3%</b>	<b>25.3%</b>	<b>97</b>	<b>32,615</b>	<b>45.5%</b>
<i>Domestic Equity</i>	20.9%	20.6%	22	13,723	19.1%
<i>International Developed</i>	26.7%	25.6%	104	12,965	18.1%
<i>Emerging Markets</i>	40.4%	37.4%	294	5,928	8.3%
<b>Private Equity</b>	<b>24.3%</b>	<b>24.3%</b>	<b>0</b>	<b>7,331</b>	<b>10.2%</b>
<b>Real Estate</b>	<b>9.0%</b>	<b>7.8%</b>	<b>119</b>	<b>6,110</b>	<b>8.5%</b>
<b>Total Timberland</b>	<b>8.3%</b>	<b>3.3%</b>	<b>504</b>	<b>2,542</b>	<b>3.5%</b>
<b>Hedge Funds</b>	<b>8.3%</b>	<b>7.2%</b>	<b>105</b>	<b>5,876</b>	<b>8.2%</b>
<b>Value Added Fixed Income</b>	<b>10.3%</b>	<b>6.9%</b>	<b>345</b>	<b>5,625</b>	<b>7.8%</b>
<b>Core Fixed Income</b>	<b>5.4%</b>	<b>5.5%</b>	<b>(10)</b>	<b>8,796</b>	<b>12.3%</b>

**PRIT Asset Class Performance (Gross of Fees)**

Annualized Returns as of December 31, 2017

1 Year	3 Year	5 Year	10 Year
<b>GLOBAL EQUITY</b> 26.3%	<b>PRIVATE EQUITY</b> 18.1%	<b>PRIVATE EQUITY</b> 19.1%	<b>PRIVATE EQUITY</b> 12.8%
<b>PRIVATE EQUITY</b> 24.3%	<b>GLOBAL EQUITY</b> 10.4%	<b>GLOBAL EQUITY</b> 11.5%	<b>VALUE-ADDED FIXED INCOME</b> 6.7%
<b>VALUE-ADDED FIXED INCOME</b> 10.3%	<b>REAL ESTATE</b> 9.5%	<b>REAL ESTATE</b> 10.8%	<b>REAL ESTATE</b> 6.5%
<b>REAL ESTATE</b> 9.0%	<b>VALUE-ADDED FIXED INCOME</b> 5.2%	<b>TIMBER</b> 6.8%	<b>GLOBAL EQUITY</b> 5.4%
<b>TIMBER</b> 8.3%	<b>TIMBER</b> 4.9%	<b>HEDGE FUNDS (NET OF FEES)</b> 5.7%	<b>CORE FIXED INCOME</b> 4.7%
<b>HEDGE FUNDS (NET OF FEES)</b> 8.3%	<b>HEDGE FUNDS (NET OF FEES)</b> 3.5%	<b>VALUE-ADDED FIXED INCOME</b> 4.4%	<b>TIMBER</b> 4.3%
<b>CORE FIXED INCOME</b> 5.4%	<b>CORE FIXED INCOME</b> 2.5%	<b>CORE FIXED INCOME</b> 3.8%	<b>HEDGE FUNDS (NET OF FEES)</b> 3.0%

## 2018 LONG-TERM ASSET ALLOCATION PLAN APPROVED

Each calendar year, PRIM staff presents to the Investment Committee and PRIM Board the results of months of work to determine the appropriate asset allocation policy for the PRIT Fund. The Committee and Board unanimously approved this year's recommendations following presentations in January and February. PRIM is guided by the 7.50% required rate of return and, therefore, the portfolio requires an equity and growth focus. This means global equities, private equity, real estate and value-added fixed income play a vital role in the portfolio. Most other asset classes serve to dampen the volatility of the PRIT Fund.

The PRIT Fund allocation bands will provide flexibility to fund alternative opportunity sets. Global Equity has a band of +/- 5% while the band for all other asset classes are +/-3%. These bands have always been part of our policy. The PRIT Fund's 40% Global Equity allocation will be reduced by 1% to a mid-point target of 39%. This reduction will provide funding for a 1% increase in Private Equity to a 12% mid-point target. The Equity Hedge allocation in the Portfolio Completion Strategies (PCS) sleeve will move to 3% as a mid-point target from 1.3%, as PCS will remain at 13% mid-point allocation. Within Global Equity, U.S Equity will be reduced to a mid-point target of 17.5% from 18%, and international developed equities will be reduced to 15.5% from 16%.

### 2018 PRIT Fund Target Asset Allocation

Approved February 15, 2018

Asset	Current Target	New Strategic Target	New Strategic Mid-Point
<b>Global Equity</b>	<b>40%</b>	<b>34% - 44%</b>	<b>39%</b>
<i>US Equity</i>	18%		17.5%
<i>Int'l Developed Equities</i>	16%		15.5%
<i>Emerging Int'l Equities</i>	6%		6%
<b>Core Fixed Income</b>	<b>12%</b>	<b>9% - 15%</b>	<b>12%</b>
<i>Core Bonds</i>	5%		5%
<i>Long-duration Treasury</i>	2%		2%
<i>Inflation Linked Bonds</i>	5%		5%
<b>Value-Add Fixed Income</b>	<b>10%</b>	<b>7% - 13%</b>	<b>10%</b>
<b>Private Equity</b>	<b>11%</b>	<b>9% - 15%</b>	<b>12%</b>
<b>Real Estate</b>	<b>10%</b>	<b>7% - 13%</b>	<b>10%</b>
<b>Timberland</b>	<b>4%</b>	<b>1% - 7%</b>	<b>4%</b>
<b>PCS</b>	<b>13%</b>	<b>10% - 16%</b>	<b>13%</b>
<i>Equity-Hedge PCS</i>	1.3%	1% - 5%	3%
<b>Sum</b>	<b>100%</b>		<b>100%</b>

## PRIM DEVELOPMENTS

### Organizational Update

**Bill Li, CFA, CAIA** on the Portfolio Completion Strategies (PCS) team was promoted to Senior Investment Officer. Bill was hired in May of 2016 as an Investment Officer and has been an extremely hard-working and valuable member of the investment team focused primarily on developing innovative initiatives from PCS and Strategy, including alternative risk premia harvesting strategies, the hedged equity program and asset allocation. With Eric Nierenberg, Ph.D., he is also responsible for ongoing due diligence and manager sourcing in our Hedge Fund portfolio. Bill has a Master's degree in economics and finance from Brandeis and a Bachelor of Science degree from Dongbei University in China.

**Maria Garrahan** joined PRIM in January of 2018 as an Investment Officer. She reports to Eric Nierenberg and joins Bill Li on the PCS team. Maria joins PRIM after 2½ years at Columbia Threadneedle Investments as a research analyst focused on global asset allocation. Her prior experience includes working as a research assistant for Professor Ken Froot of the Harvard Business School where she focused on factor-based investment techniques, an element of investing that is becoming increasingly important to us at PRIM. Maria holds a Master's degree in applied economics from Northeastern University and a Bachelor of Arts degree in economics, magna cum laude, from Eastern Connecticut State University.

In November, **Ed Caron** joined PRIM as an Investment Operations Analyst. He will work on accounting and reporting on PRIM's private investments. Ed joins PRIM from BNY-Mellon, where he serviced two large public plans; and before that, he worked at State Street Bank. Ed is a graduate of UMass-Amherst, from which he holds a Bachelor of Arts in finance.

**Alyssa Fiore**, a member of PRIM's private equity team, and **Andrew Gromer**, a member of the public markets team, received their CFA Charters in November. This is a major accomplishment that requires passing three difficult exams over three years and working for four years in the investment sector. This brings the number of PRIM investment staff who have earned their CFA Charters to nine. That's about two-thirds of PRIM's investment staff.

**Christina Marcarelli**, Investment Officer – Real Estate and Timberland, has volunteered to lead PRIM's diversity initiatives. PRIM recognizes the value of diversity of thought in decision-making and of having a diverse staff. We are excited to have Christina continue a long legacy of recruitment and retention programs aimed at diverse employees. Christina has played an important role in direct real estate investments and in performing in-house analysis of real estate markets and due diligence on PRIM's real estate holdings.

### Public Markets Update

At its February 15, 2018 meeting, the PRIM Board on approved an investment of up to \$60 million to the Berkshire Multifamily Debt Fund II, an investment within the Value-Added Fixed Income allocation, specifically within the Other Credit Opportunities (OCO) strategy. The focus of the Fund will be to invest in a portfolio of subordinated bonds, known as B-piece bonds, of Freddie Mac multifamily loan pool securitizations.

The PRIM Board approved the issuance of a Request for Proposals (RFP) for Active U.S. Micro-Cap Equity investment management services.

The PRIM Board approved the change to the active/passive split in Emerging Markets Equities from to 100% active from a 75% active/25% passive split.

### Portfolio Completion Strategies Update

At its February 15, 2018 meeting, the PRIM Board approved the Investment Committee recommendation for Emerging Manager Direct Hedge Fund Advisory and Managed Account Platform Services, following an

RFP process. The Board selected NewAlpha Asset Management (NewAlpha) to provide advisory services for the Emerging Manager Direct Hedge Fund program. The Board also selected Innocap to provide managed account platform services for the Emerging Manager Direct Hedge Fund program. NewAlpha and Innocap submitted a joint proposal for this RFP. Once NewAlpha and Innocap are in place, they will commence a search for emerging managers in the Global Macro hedge fund space. Specific strategy types will include discretionary macro, systematic macro, CTA and relative value, etc. PRIM Staff believe that emerging managers tend to outperform their larger peers and that the defensive nature of Global Macro strategies could help improve the return/risk profile of the PRIT fund.

#### Private Equity Update

At its February 15, 2018 meeting, the PRIM Board approved allocations of up to \$250 million to two private equity funds with which PRIM has made previous successful investments: Thoma Bravo Discover Fund II, L.P., and American Securities Partners VIII, L.P. Thoma Bravo invests in infrastructure software and technology services in the middle market. Fund II will target investment opportunities in the lower middle market. American Securities invests in middle-market companies in North America. Fund VIII will target value-oriented investments across various industries. The firm has maintained a consistent focus on the industrial sector and has also pursued investments in business services, healthcare, energy and consumer.

#### Proxy Voting Guidelines Update

PRIM Board on February 15, 2018, adopted the 2018 custom policy enhancements to PRIM's Custom Proxy Voting Guidelines, as recommended by PRIM's shareholders services vendor, Institutional Shareholder Services (ISS), and the PRIM Administration & Audit Committee. The 2018 custom policy enhancements only required one modification to PRIM's current policy, which is to vote against shareholder proposals that discriminate on the basis of sexual orientation or gender identity.

***The Client Services team -- Paul Todisco, Francesco Daniele and Sam Olivier -- will continue meeting the retirement boards of PRIM's member retirement systems throughout the year. To schedule a visit, please contact Paul at [ptodisco@mapension.com](mailto:ptodisco@mapension.com), Francesco at [fdaniele@mapension.com](mailto:fdaniele@mapension.com) or Sam at [solivier@mapension.com](mailto:solivier@mapension.com), or call 617-946-8401. We look forward to seeing you soon.***