



INVESTMENT MANAGEMENT COMMITTEE



June 2016

**TEACHER RETIREMENT SYSTEM OF TEXAS MEETING
BOARD OF TRUSTEES
AND
INVESTMENT MANAGEMENT COMMITTEE**

*(Mr. Colonna, Committee Chair; Mr. Corpus, Mr. Kelly, & Two Vacant Positions,
Committee Members. Committee members subject to change at the June meeting)*

AGENDA

**June 16, 2016 – 11:15 a.m.
TRS East Building, 5th Floor, Boardroom**

1. Consider approval of the proposed minutes of the April 7, 2016 committee meeting – Committee Chair.
2. Receive updates on the following concerning the Private Strategic Partnership – Mike Pia
 - A. Partnership performance and market conditions - Courtney Villalta
 - B. Apollo's portfolio and performance – Leon Black
3. Receive updates on the following concerning External Private Markets – Eric Lang:
 - A. Private equity – Neil Randall.
 - B. Real assets – Grant Walker.
 - C. Energy and Natural Resources – Carolyn Hansard.

NOTE: The Board of Trustees (Board) of the Teacher Retirement System of Texas will not consider or act upon any item before the Investment Management Committee (Committee) at this meeting of the Committee. This meeting is not a regular meeting of the Board. However, because the full Investment Management Committee constitutes a quorum of the Board, the meeting of the Committee is also being posted as a meeting of the Board out of an abundance of caution.

Minutes of the Investment Management Committee

April 7, 2016

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on April 7, 2016 in the boardroom located on the fifth floor of the TRS East Building offices located at 1000 Red River Street, Austin, Texas. The following committee members were present:

Todd Barth, Presiding Chair
David Corpus
David Kelly
Nanette Sissney

Others present:

Christopher Moss, TRS Trustee
Anita Palmer, TRS Trustee
Karen Charleston, TRS Trustee
Dolores Ramirez, TRS Trustee
Brian Guthrie, TRS
Ken Welch, TRS
Jerry Albright, TRS
Carolina de Onís, TRS
Britt Harris, TRS
Amy Barrett, TRS
Bernie Bozzelli, TRS
Chi Chai, TRS
Patrick Cosgrove, TRS
James Nield, TRS

Katy Hoffman, TRS
Jaime Llano, TRS
KJ Van Ackeren, TRS
Karen Morris, TRS
Barbara Forssell, TRS
Heather Traeger, TRS
Dan Junell, TRS
Lynn Lau, TRS
Hugh Ohn, TRS
Steve Huff, , Fiduciary Counsel, Reinhart Boerner Van Deuren s.c.
Dr. Keith Brown, Investment Advisor
Steve Voss, Aon Hewitt
Philip Mullins, Texas Retired Teachers Association
Ann Fickel, Texas Classroom Teachers Association

Mr. Barth called the meeting to order at 12:15 p.m. A quorum was present.

1. Consider the approval of the proposed minutes of the November 19, 2015 committee meeting – Joe Colonna.

On a motion by Mr. Kelly, seconded by Mr. Corpus, the committee unanimously voted to approve the proposed minutes of the November 19, 2015 meeting, as presented.

2. Receive and discuss the annual Internal Public Markets review – Chi Chai, Patrick Cosgrove, and KJ Van Ackeren.

Mr. Chai provided an overview of the Internal Public Markets, including its assets, performance, the GBI portfolio structure, characteristics, key policy limits, and team organization.

Mr. Cosgrove discussed the global regional and sector returns. He noted the deteriorating performance in commodities and its dramatic impact on the global regional returns. He stated that the portfolio benefited from a significant underweight in commodity-producing countries, primarily Australia and Canada, and overweight in performing countries such as Japan. In response



to a question from Dr. Brown regarding the currency impact, there was a discussion regarding revisiting the policy in using currency. Mr. Harris stated that the Internal Investment Committee currently was assigned the responsibility of determining the appropriate currency hedge and Mr. Chai's team has also been reviewing and testing an internal currency product for the same function. He stated that if staff decides to change the policy, they will bring it back to the board for discussion. Mr. Cosgrove then provided an update on the performance of the portfolio components, including GBI Flagship, GBI Core, GBI Quant, GBI Alpha Opportunity, and GBI U.S. High Quality portfolios. He noted that TRS' global active fund was currently the seventh largest actively managed global fund and it was one of the five funds that had beat the benchmark in eight consecutive years.

Mr. Van Ackeren discussed the GBI portfolio characteristics, including its risk profile, sources of added value, the largest holdings and overweights versus the benchmark as of December 31. He also provided an update on the GBI Gold Fund performance and noted that TRS was the only pension fund in the world with a formal process for gold allocation and decision-making. He stated that the gold fund was developed for diversification and to offer a hedge to declining markets. Mr. Van Ackeren confirmed for Dr. Brown that the overperformance of the gold fund was a combination of the commodities index and equity index. Mr. Harris clarified that TRS did not own physical gold. Mr. Van Ackeren provided the 2015 accomplishments and 2016 priorities.

Mr. Chai concluded the presentation by reiterating the outperformance in 2015 and over the past eight years. He stated that the portfolio had exceeded the alpha target of 50 basis point and produced 56 basis points a year on average.

3. Receive and discuss the annual Trading Management Group review – Bernie Bozzelli, Jaime Llano, and Steve Peterson.

Mr. Bozzelli provided an overview of the Trading Management Group, including its functions, performance, and organizational structure. He described the cross-divisional collaboration, management of the trading partner network, and the broker certification and evaluation process.

Mr. Peterson provided an update on the equity trading performance in 2015. He highlighted a project partnered with an outside firm to improve overall performance and efficiency of equity trading. He stated that the data would help traders make better decisions when they choose the strategy with which to execute an equity order; and make specific recommendations to algorithm (algo) providers to modify the algo to better suit the traders' needs. Mr. Llano then discussed the 2016 priorities.

Mr. Bozzelli concluded the presentation by reiterating the three factors to have a top performing trading desk: (1) having the right team, (2) having the right systems and technology, and (3) having the right counterparties. Per Ms. Palmer's request, Mr. Bozzelli provided an update on the effort brought up by Mr. Ronan Ryan of the SEC at the February board meeting regarding the process of moving the overall market structure from being a dark pool to an exchange. He further explained that by having an exchange that is solely focused on providing an avenue for institutions to exchange capital efficiently would be beneficial to TRS.



The meeting adjourned at 1:06 p.m.

APPROVED BY THE **INVESTMENT MANAGEMENT COMMITTEE** OF THE BOARD
OF TRUSTEES OF THE TEACHER RETIREMENT SYSTEM OF TEXAS ON THE 16TH DAY
OF JUNE, 2016.

ATTESTED BY:

Dan Junell
Secretary to the TRS Board of Trustees

Date





Private SPN Deep Dive/Quarterly SPR Update

Mike Pia, Director
Courtney Villalta, Senior Investment Manager
June 2016

Agenda

- I. SPR Team Overview
- II. Private Markets Summary
- III. Private SPN Deep Dive
- IV. Accomplishments and Priorities

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Strategic Partnerships & Research Group (SPR)



Mike Pia, CFA, CAIA

Director

BS Mechanical Engineering, United States Naval Academy
MS Software Engineering, University of West Florida
MBA, Texas Christian University

INVESTMENTS TEAM

PUBLIC MARKETS



Jean-Benoit Daumerie
Investment Manager

BS Engineering,
University of Pennsylvania
MBA, Rice University



Christopher White
Associate

BS Engineering Management,
United States Military Academy
MBA Finance, UT Austin

PRIVATE MARKETS



Courtney Villalta
Senior Investment Manager

BS Finance, St. Edward's University



Blake Holman
Associate

BA Communications, TX State University
MBA, University of Colorado

ANALYTICS TEAM



Patricia Cantu
Senior Associate

AA Business Management, Austin
Community College



Susan White
Analytics and Support

BS French, The Pennsylvania State
University
Claritas Investment Certification

MARKET INTELLIGENCE TEAM



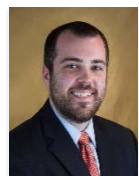
Curt Rogers, CAIA, CFA, FRM
Director

BS & MS Aeronautical Engineering,
Massachusetts Institute of
Technology
MBA Finance, UT Austin



Phillip Auth, CFA
Investment Manager

BS Economics, University of New Mexico
MBA International Finance, UT Austin



Matt Wey, CPA
Senior Analyst

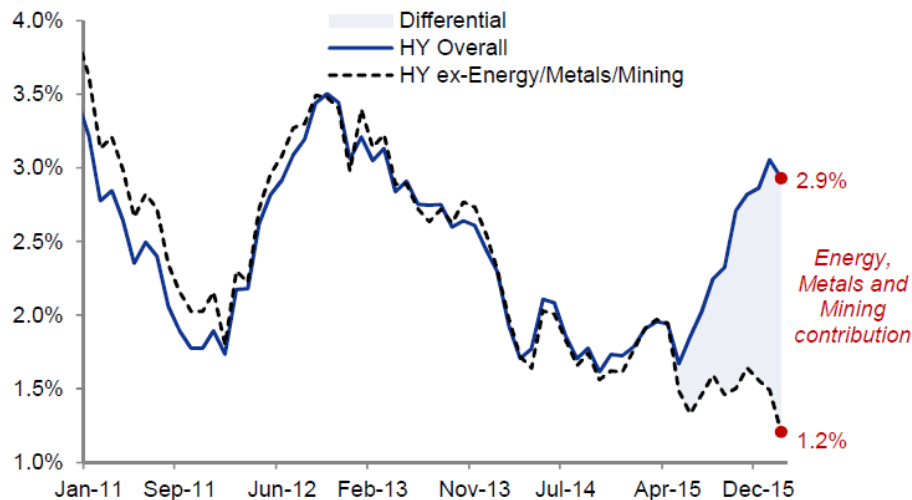
BBA Accounting, Texas A&M
MS Finance & Mathematics, Texas A&M

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Market Conditions

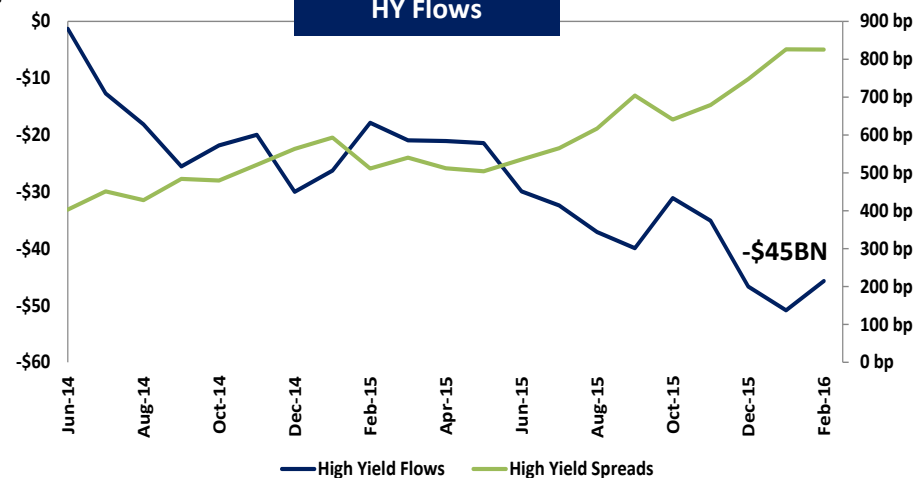
Credit

12-Month Trailing HY Default Rate



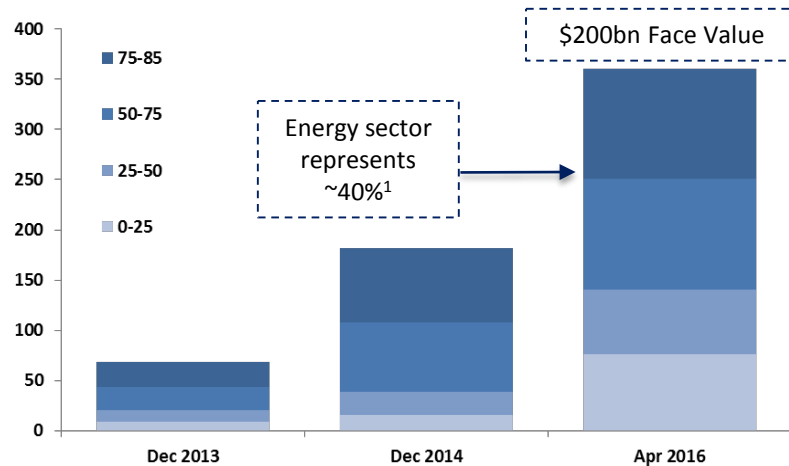
\$ Billions

HY Flows



- Credit markets increasingly attractive, but not broadly dislocated
- Though HY markets have rallied in recent weeks, commodity prices continue to drive overall credit risk appetite
 - Market volatility creating opportunities for long-term investors
 - Number of bonds trading <85 is considerable, even ex-energy (>350 bonds, ~25% of total HY market face value).
 - Flight to quality driving largest spread gap between CCC and BB rated bonds since 2009 (>1100+bps)
- Given banking regulatory pressures, illiquidity premium in originated credit is attractive
 - All-in coupons in mezzanine ~500bps above the syndicated HY index (13-15% IRR expectation)

of HY Bonds Trading Below \$85



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Accomplishments and Priorities

Private Markets SPN

2015 Accomplishments

- Implemented Board approved increase of \$2 billion “Phase Two” capital for SPN-Strategic
 - Committed \$450 million to four new investments within the SPN-Strategic
- A \$2 billion Tactical Value SPN strategy was Board approved and launched
- Hired new SPN team members (Blake Holman and Chris White)
- Completed three SPN Summits
- Successful 2015 Training Exchange Program in NYC
- Completion of four 2015 Research Projects

2016 Priorities

- \$1 billion in projected 2016 commitments for SPN-Strategic portfolio
- \$1 billion in projected 2016 investments for SPN-Tactical Value portfolio
- Successful roll-out of market and portfolio review calls across the Trust
- Enhanced portfolio monitoring and data analytics within SPN portfolios to provide greater asset-level transparency
- SPN Summits
 - Spring Summit held in Austin on April 13th (see appendix for summary notes)
 - 4th annual joint public/private Summit to be held on August 3rd in New York
 - Fall Summit to be held in Austin on November 2nd
- Develop / complete 2016 “Blank Canvas” research project
- 2016 Training Exchange Program

APPENDIX

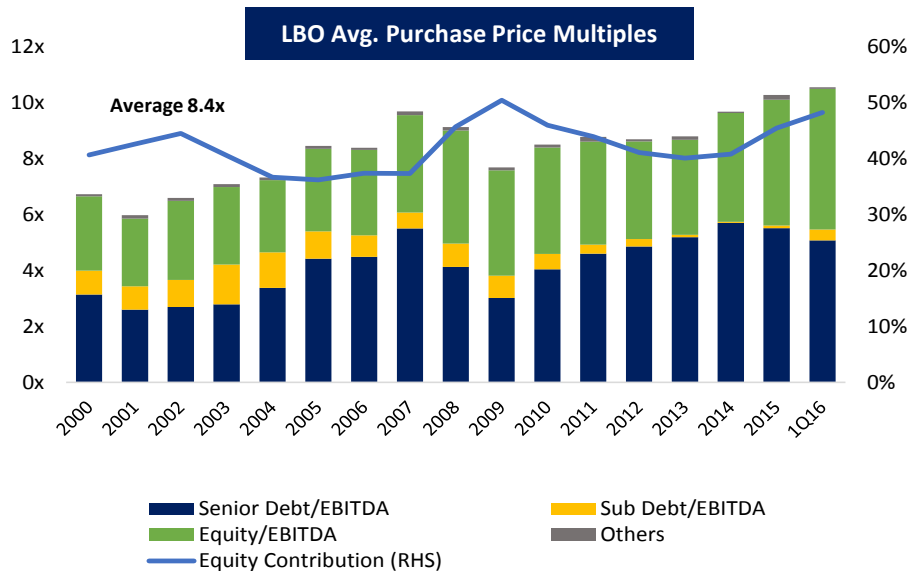
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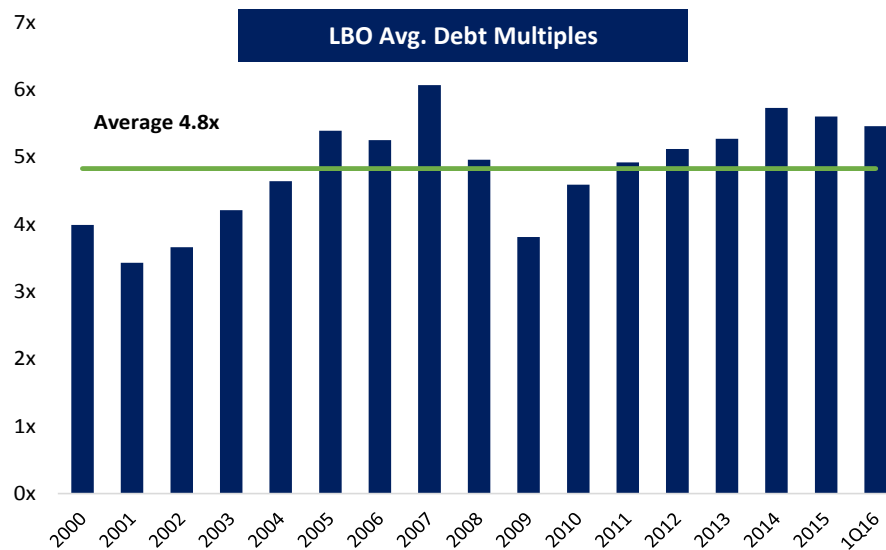
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Market Conditions

Private Equity



- PE environment is predominately overvalued - purchase price multiples at peak levels
- In an overvalued market, fewer ways to make PE-like returns
 - Buying at below-average multiples via distress or complex carve-outs/build-up strategies
- For conventional buyouts, need to factor in multiple compression
 - Outsized company-level growth (outpacing GDP by a multiple) becomes necessary to grow out of a lower exit multiple

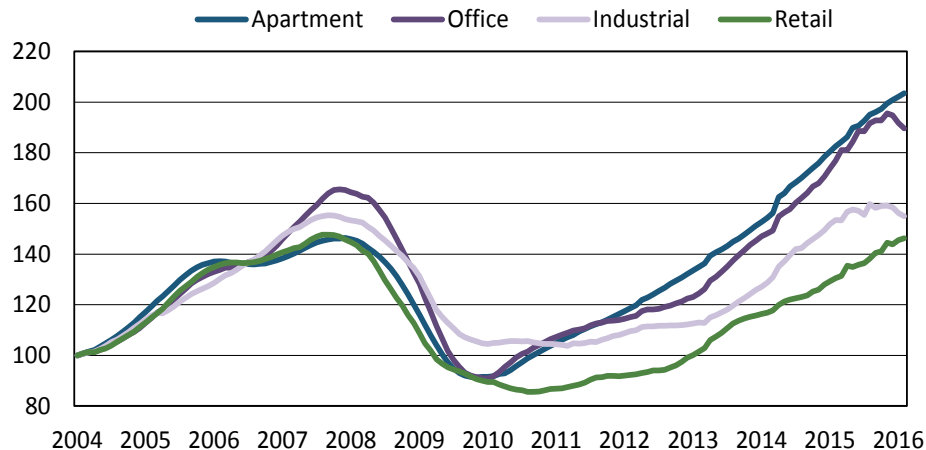


Source: S&P Capital IQ Leveraged Buyout Review, all size buyouts, as of March 31, 2016

Market Conditions

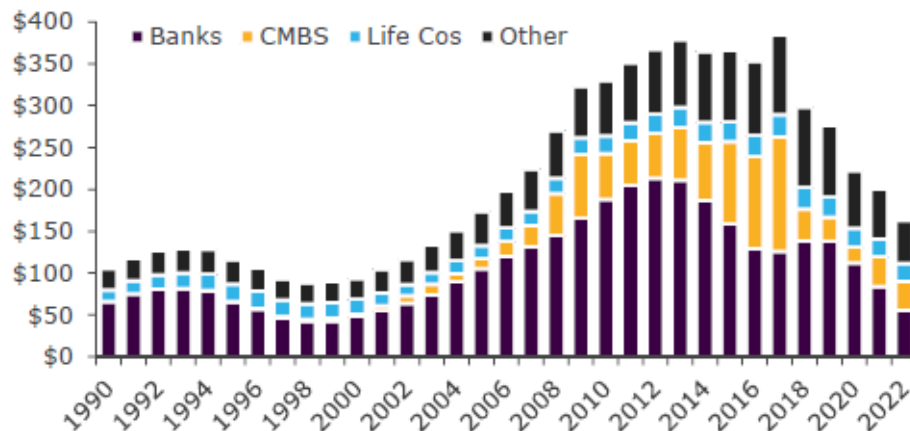
Real Estate

U.S. Commercial Property Price Index

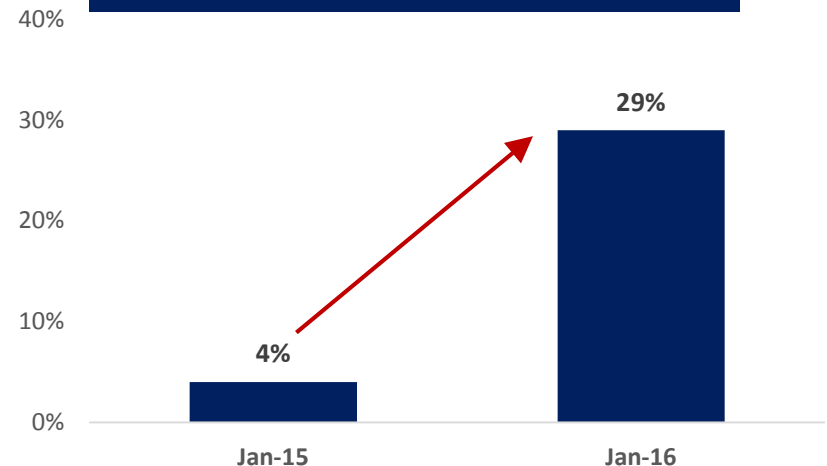


- Real estate equity values look expensive, though supply/ demand fundamentals still generally good
 - Avg. commercial property values are now 16% above the 2007 peak
 - Public REITs have been traded down meaningfully over the past year, signaling a downward re-pricing of CRE
 - Late stage in the macro cycle / low growth expectations
- However, pockets of attractiveness exist:
 - Wall of CRE debt maturities needs to be addressed, in what has become a highly constrained banking regulatory environment
 - >\$700 billion of CRE loans mature between 2016 - 2017

Maturing CRE Loans Across Lending Types (\$B)



% of REITs Trading Below >20% Below NAV



April 2016 SPR Summit

Major Takeaways

- Co-investment activity remains strong between TRS Principal Investment Groups and the Private SPNs
- Global macroeconomic conditions remain challenging as valuations are high and yields continue to decline
- Much of global volatility is driven by China and emerging markets
- Monetary policy remains accommodative as uncertainty persists globally
- The world remains awash with records levels of debt, with China leading the pack
- The credit markets continue to evolve as increased regulation creates volatility in the market, driving the need for alternative sources of lending

SPR Mandates

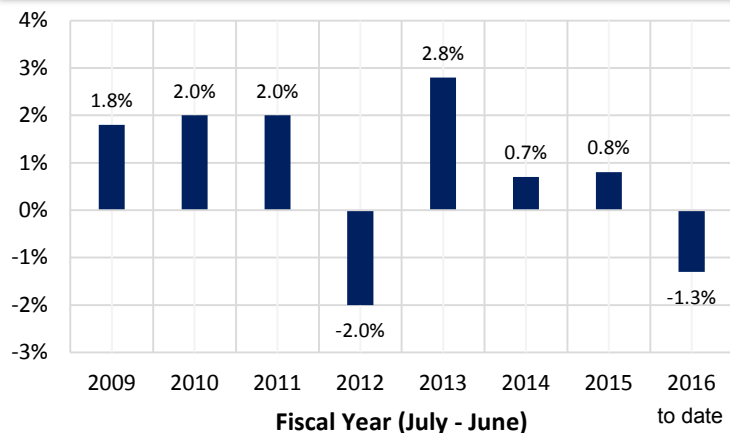
Public Investments	<ul style="list-style-type: none">• Manage, oversee and monitor four unique long-term investment relationships in the public markets around the world
Private Investments	<ul style="list-style-type: none">• Work closely with two industry-leading private markets partners to identify and allocate capital to attractive private opportunities
Market Intelligence	<ul style="list-style-type: none">• Integrate global-macro-based products and services into public and private investment decisions across the Trust to enhance returns
Research Provider	<ul style="list-style-type: none">• Work with heavily resourced partners to provide customized, timely investment research and training that meets the needs of the IMD
Headlight Systems	<ul style="list-style-type: none">• Use and disseminate views and positioning data from partners to provide insight and support to other groups in the Trust
Center of Excellence	<ul style="list-style-type: none">• Leverage the TRS investment network to develop new products and superior processes to help ensure that the IMD is world-class in every respect

Public Markets SPN Performance

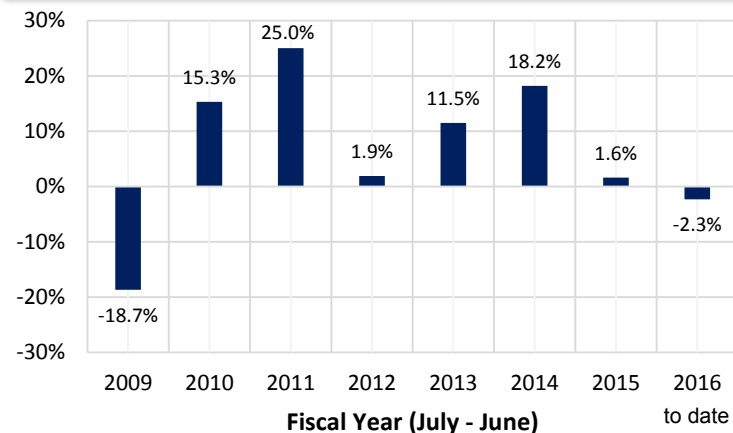
As of March 31, 2016

Program	Assets		Annualized Return %			Annualized Alpha %			Tracking Error %			Information Ratio		
	NAV (\$m)	% of Trust	1-Year	3-Year	Since Incept.	1-Year	3-Year	Since Incept.	1-Year	3-Year	Since Incept.	1-Year	3-Year	Since Incept.
BlackRock	1,609	1.3%	-2.6	6.26	6.0	-0.2	1.6	0.9	1.1	2.0	2.0	-0.1	0.8	0.5
JP Morgan	1,692	1.3%	-3.7	5.46	6.5	-1.2	0.8	1.4	2.0	1.9	2.3	-0.6	0.4	0.6
Morgan Stanley	1,571	1.2%	-5.6	5.03	5.7	-3.2	0.4	0.6	1.9	2.6	2.0	-1.7	0.2	0.3
Neuberger Berman	1,557	1.2%	-5.4	3.36	5.5	-3.0	-1.3	0.4	2.6	2.1	2.2	-1.1	-0.6	0.2
Total Public SPN	6,429	5.0%	-4.3	5.0	5.9	-1.9	0.4	0.9	1.4	1.5	1.4	-1.3	0.3	0.6

Net Alpha by Public Markets SPN



Net Return by Public Markets SPN



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External Private Markets

Eric Lang

Senior Managing Director

June 2016

Private Markets Executive Summary

Portfolio Performance ¹											
Portfolio	Market Value	% of Trust	1-Year TWR	3-Year TWR	5-Year TWR	1-Year IRR	3-Year IRR	5-Year IRR	SI IRR	Expected Market Return	PL Invested Managers
Private Equity	\$15,343	12.0%	9.6%	14.8%	13.3%	7.8%	14.8%	14.1%	13.2%	12.0%	39
Real Assets	\$17,953	13.7%	12.9%	12.9%	12.6%	12.2%	12.9%	12.8%	8.6%	8.0%	54
Energy & Natural Resources	\$2,112	1.7%	-15.3%	-	-	-16.6%	-5.1%	-2.1%	-0.6%	12.0%	25
Total	\$35,408	27.4%	-	-	-	8.2%	12.5%	12.5%	10.6%	NA	118

Principal Investments Performance ¹										
Portfolio	Market Value	% of Portfolio	No.	1-Year TWR	3-Year TWR	5-Year TWR	1-Year IRR	3-Year IRR	5-Year IRR	SI IRR
Private Equity	\$2,536	16.5%	30	4.4%	16.8%	18.1%	4.4%	15.9%	19.7%	19.5%
Real Assets	\$4,973	27.7%	54	15.0%	14.6%	15.1%	15.5%	14.9%	15.5%	16.4%
Energy & Natural Resources	\$699	33.1%	12	-9.4%	10.4%	20.5%	0.2%	20.2%	17.0%	16.7%
Total	\$8,208	23.2%	96	-	-	-	10.0%	15.8%	16.7%	17.1%

Diversification Impact			
Economic Regime	Private Equity	Real Assets	ENR
Stable Value	(0.34)	(0.12)	(0.28)
Global Equity	0.94	0.19	0.54
Real Return	0.03	0.66	0.24
GOOD DIVERSIFICATION			

Risk Impact			
Portfolio	Volatility		Draw Down ²
	Observed	Risk Proxy	
S&P 500	18.2%	18.2%	45.8%
Private Equity	12.2%	23.2%	29.9%
Real Assets	11.6%	22.0%	41.5%
ENR	12.0%	26.2%	19.0%

2015 Investment Activity			
Portfolio	Funds	PIs	Total
Private Equity	14	8	22
Real Assets	13	15	28
ENR	7	3	10
Total	34	26	60

¹Source: State Street

²Note: Public Energy Sector Drawdown was 53.8%

³Additions since last board meeting

TRICOT

Goals:

- In 2015, TRS established a London Office (TRICOT) to be considered the “preferred destination for large, attractive, investments”
 - Increased deal flow by 50% from European managers who allocate co-investments
 - Improved risk controls from increased knowledge of the subtleties in market
 - Better due diligence information as a result of being present more often as conditions change
 - Rapid response with TRS presence in London
 - Substantial potential cost savings for the Trust

Update:

- London office (TRICOT) staffed with 4 team members, led by Allen MacDonell
- TRICOT vetted 37 principal investments, approximately \$4.7 billion in potential investments
- Three new principal investments made by IIC totaling \$412 million
 - Expected returns 12.8% to 16.1%
 - Expected annual fee savings at over \$9 million
- Senior IMD Management make frequent visits

Private Markets Organization Chart



Eric Lang
Sr. Managing Director
BBA UT Austin
MBA U. of Houston



Neil Randall
Sr. Director – Private Equity
BBA, MS Texas A&M



Grant Walker
Sr. Director – Real Assets
BBA Baylor
MBA St. Edwards



Carolyn Hansard
Sr. Investment Manager - ENR
BS, MBA UT Austin

TRICOT (TRS LONDON)



Allen MacDonell, CFA
Sr. Investment Manager
BBA U. of Georgia
MBA Georgia State



Thomas Albright, CFA
Sr. Associate
BA Dartmouth College



Andre Weilenmann
Contractor
BA U. of Zurich
MA HSG U. of St Gallen



Laura Saxty-Smith
Contractor

PRIVATE MARKETS DATA ANALYTICS



Barbara Woodard, CPA
Sr. Associate
BBA Texas A&M



Jeff Stafford
Analyst
BS Pepperdine, U.
Canberra



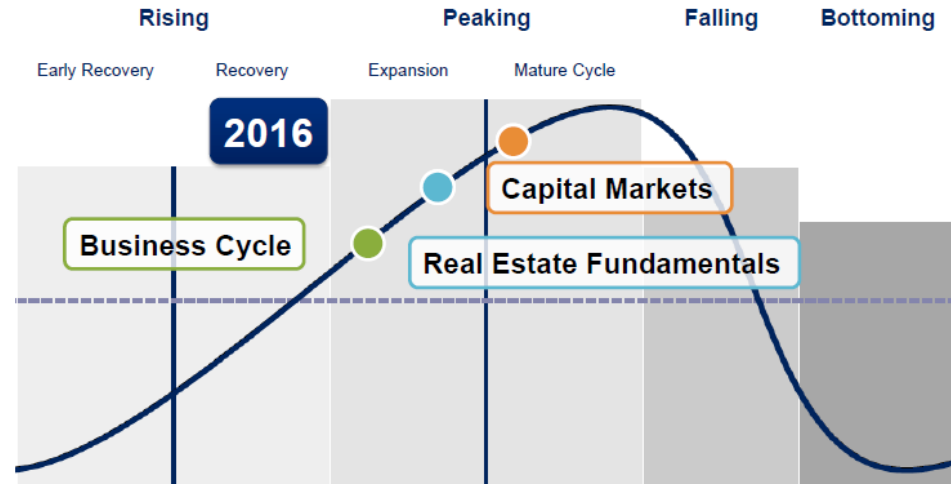
Melissa Kleihege
Deal Flow Analyst
BS Texas A&M

Other Updates

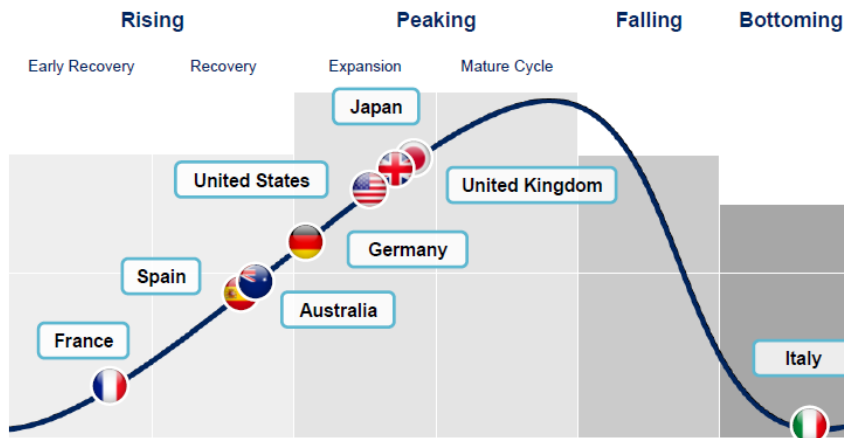
- Energy & Natural Resources team to manage Infrastructure
 - Consolidation of teams under Carolyn Hansard
 - Current Real Assets general infrastructure portfolio holdings are 70% energy and power related
 - Managing infrastructure with a single team creates efficiency and expertise
- Private Markets Data Analytics Team formed
 - Implement new technology to enhance portfolio management capabilities
 - Provide greater transparency into fund metrics and holdings

Real Assets Market Conditions

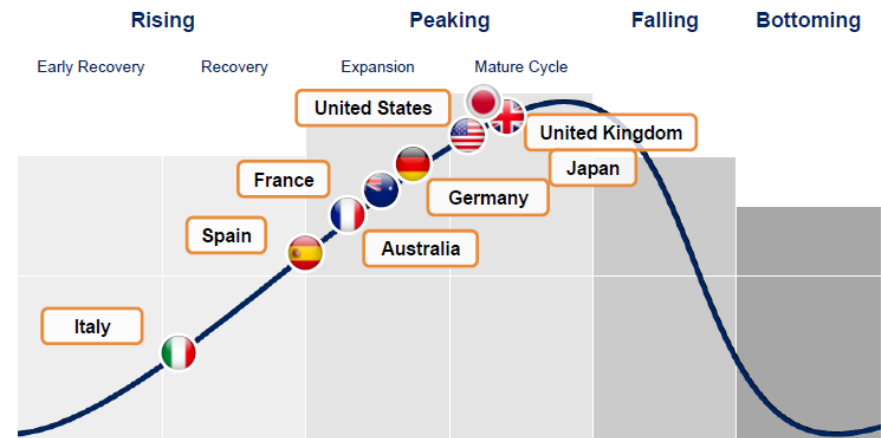
- Across the globe, the real estate capital markets environment is ahead of fundamentals and the general business cycle
- The U.S., U.K. and Japan exhibit the highest valuations and most robust fundamentals



Real Estate Fundamentals



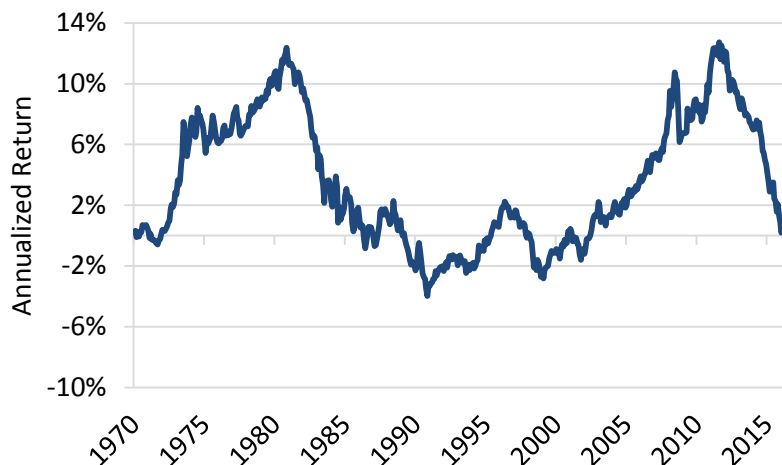
Capital Markets



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Energy and Natural Resources Market Conditions

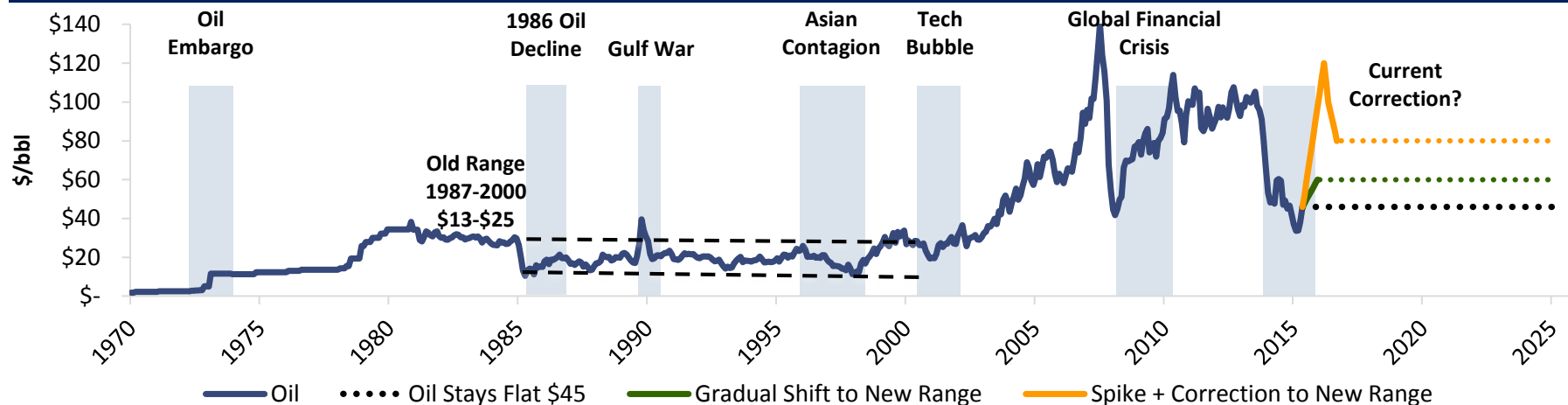
Commodity Index 10-Year Annualized Total Return¹



Oil Market Decline History²

	Start	Peak to Trough Days	% Decline	Days Trough to 2X Recovery
Oil Decline of 1986	1986	132	69%	408
Asian Contagion	1997	711	61%	233
Tech Bubble	2000	425	56%	422
Global Financial Crisis	2008	161	78%	160
Current Correction?	2014	601	76%	90 / +78%

Oil Market History and Significant Events²



¹Source: Bloomberg, Thomson Reuters Equal Weight Commodity Index

²Source: Tudor Pickering Holt



Private Equity

Neil Randall
Senior Director
June 2016

Agenda

- I. Executive Summary
- II. Organizational Structure
- III. Capital Plan
- IV. Performance
- V. Market Outlook and Conditions
- VI. Summary
- VII. Appendix

Executive Summary

PERFORMANCE			
Asset Class	1-Year Return	3-Year Return	5-Year Return
Private Equity IRR ¹	7.8%	14.8%	14.1%
Private Equity TWR ²	9.6%	14.8%	13.3%
Private Equity Benchmark ²	9.0%	11.3%	10.5%
Private Excess Return	0.6%	3.5%	2.8%
TUCS Peer Comparison	14 th	9 th	5 th

PORTFOLIO GROWTH ³			
Private Equity (\$ millions)	1-Year	3-Year	5-Year
Ending Value	\$15,343	\$15,343	\$15,343
less Starting Value	15,777	13,324	9,622
less Contributions	3,019	8,415	14,349
plus Distributions	4,629	12,317	17,372
Investment Return	\$1,176	\$5,921	\$8,745

LONG-TERM MARKET RETURN AND RISK EXPECTATIONS				
Style	Target Portfolio Weight	Strategic Goal	Expected Market Return ⁴	Public Risk Proxy ⁵
Buyout	70%	Equity Alpha	12.5%	22.8%
Growth Equity / Venture	15%	Equity Alpha	11.5%	27.9%
Credit / Special Situations	15%	Diversification	10.5%	19.1%
PRIVATE EQUITY TOTAL	100%	Equity Alpha / Diversification	12.0%	23.2%

ALLOCATION SUMMARY						
Style	% of Portfolio			% of Total Trust		
	<u>12/31/2015</u>	<u>12/31/2014</u>	<u>Change</u>	<u>12/31/2015</u>	<u>12/31/2014</u>	<u>Change</u>
Buyout	67.8%	71.4%	-3.7%	8.0%	8.3%	-0.4%
Growth Equity / Venture	14.4%	12.0%	2.4%	1.7%	1.4%	0.3%
Credit / Special Situations	13.8%	13.2%	0.6%	1.7%	1.6%	0.1%
Emerging Managers	4.1%	3.4%	0.8%	0.5%	0.4%	0.1%
PRIVATE EQUITY TOTAL	100.0%	100.0%	-	12.0%	11.8%	0.2%
Target % of Total Trust				13.0%	11.0%⁶	

¹ State Street as of 12/31/15

² State Street as of 3/31/16

³ State Street as of 12/31/15; excludes ENR

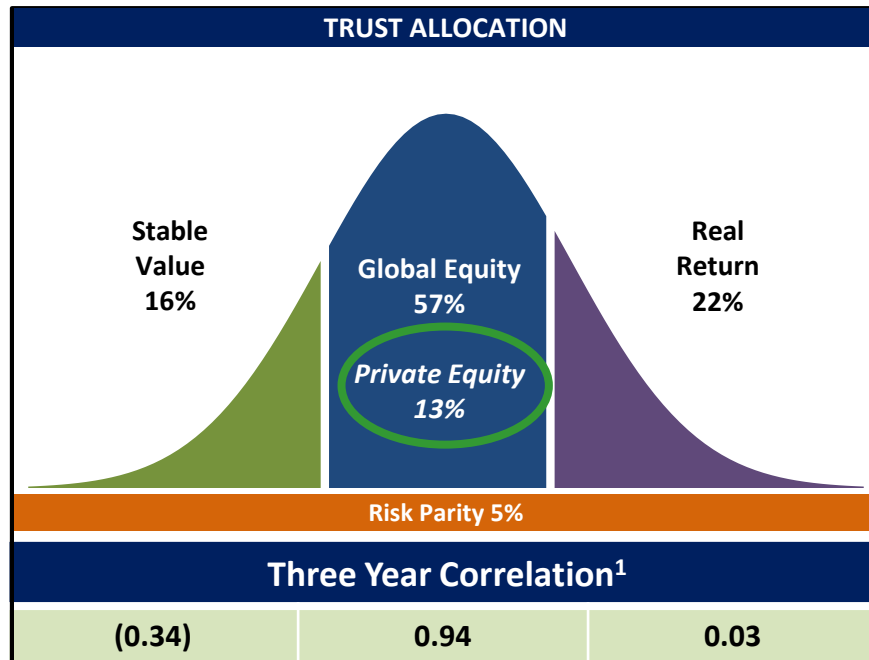
⁴ Hamilton Lane

⁵ TRS Risk Group

⁶ PE Allocation target increased from 11.0% to 13.0% as of 9/30/14

Executive Summary

Role in the TRS Trust



PRIVATE EQUITY				
Portfolio Target	Target Portfolio Weight	Expected Market Return ²	Volatility	
			Observed ³	Public Risk Proxy ⁴
Buyout	70%	12.5%	12.0%	22.8%
Growth Equity / Venture	15%	11.5%	6.0%	27.9%
Credit / Special Situations	15%	10.5%	19.3%	19.1%
Private Equity Total	100%	12.0%	12.2%	23.2%
Performance	IRR ⁵	TWR ⁶	Policy	
			Benchmark	TUCS Rank
1-Year Return	7.8%	9.6%	9.0%	14 th
3-Year Return	14.8%	14.8%	11.3%	9 th
5-Year Return	14.1%	13.3%	10.5%	5 th
Drawdown Risk		Drawdown ⁷		
S&P 500		45.8%		
Russell 2000		47.9%		
TRS Private Equity		29.9%		

¹TRS Risk Group

²Hamilton Lane

³Hamilton Lane; TRS private equity portfolio from 12/31/07 through 12/31/15

⁴TRS Risk Group

⁵State Street as of 12/31/15

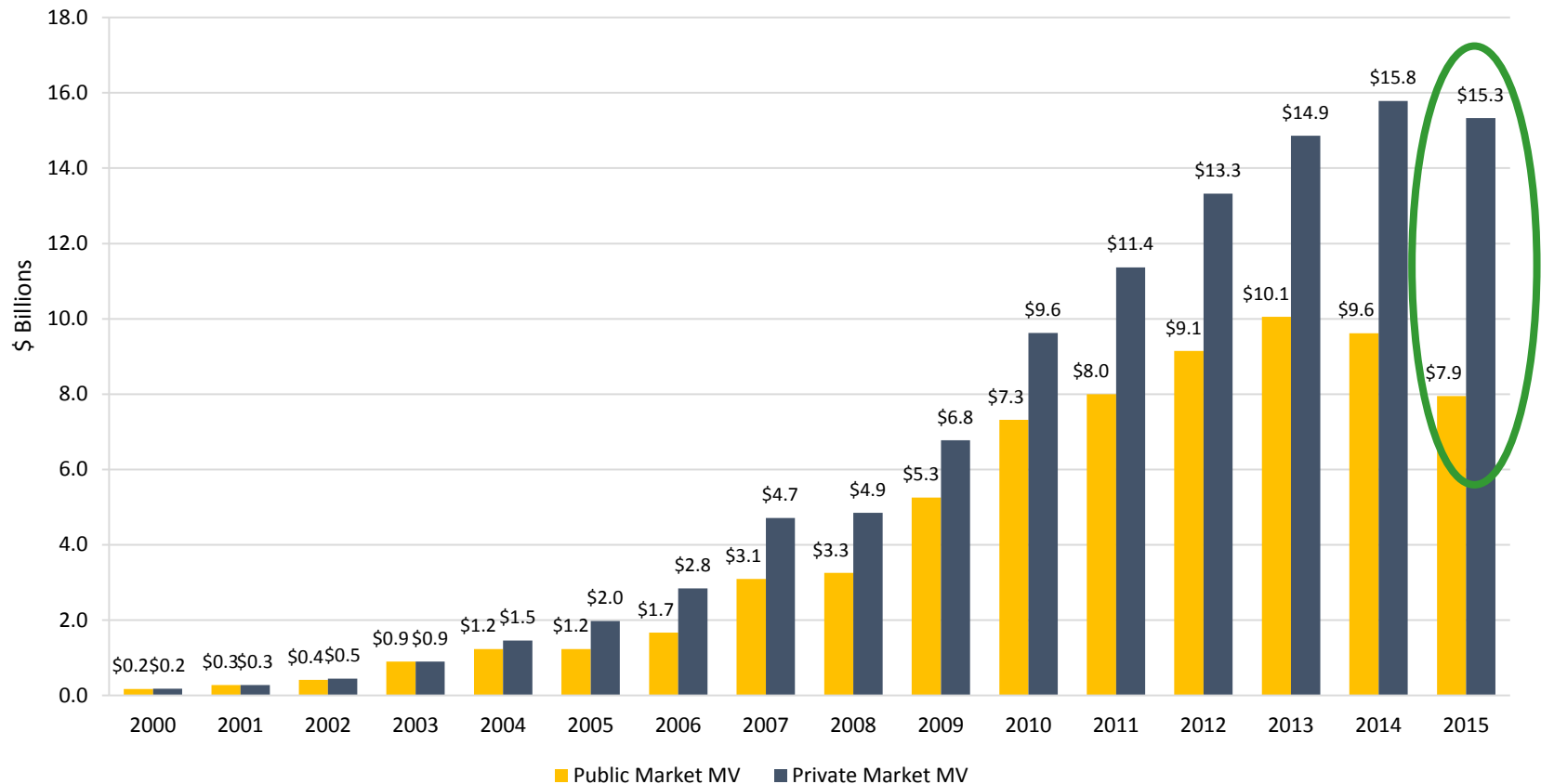
⁶State Street as of 3/31/16

⁷S&P 500 Drawdown 3/31/09; Russell 2000 Drawdown 3/31/09; TRS Private Equity Drawdown 6/30/09

Executive Summary

Private Equity Value Added

- Private Equity performance relative to Public Markets
- \$7.4 billion of value added
- Since inception alpha versus MSCI ACWI: 649 bps



Source: State Street, Hamilton Lane; values through 12/31/15

Note: Public Market values calculated by assuming investments were made in the MSCI All World index in the same size and timing as TRS Private Equity cash flows

Private Markets Organization Chart



Neil Randall
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TRICOT
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Jackie Greenstein
Contractor
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Advisors and Consultants
BlackRock and Hamilton Lane

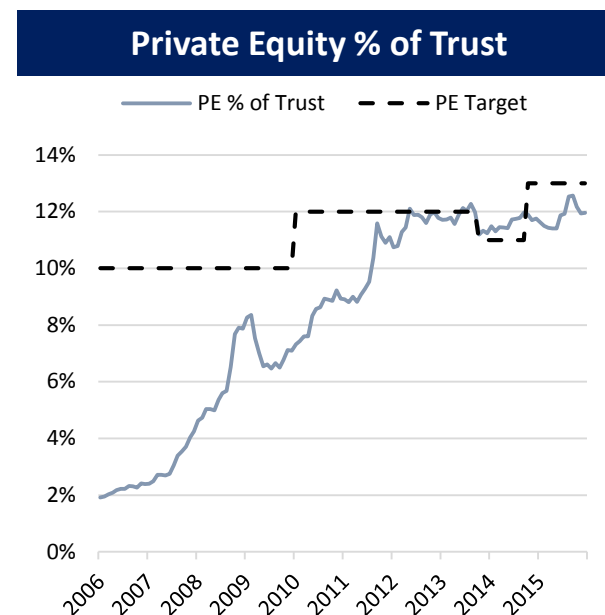
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Performance

Asset Growth, Allocation, and Returns

Growth (\$ millions) ¹	1-Year	3-Year	5-Year
Ending Value	\$15,343	\$15,343	\$15,343
less Starting Value	15,777	13,324	9,622
less Contributions	3,019	8,415	14,349
plus Distributions	4,629	12,317	17,372
Investment Return	\$1,176	\$5,921	\$8,745

Premier List Investments ²	Total	Committed Since 1/2015	Committed Since 1/2012
Number of Premier Managers	39	21	34
Percent Committed in Funds	84%	74%	74%
Percent Committed in Principal Investments	16%	26%	26%



Style	Allocation			Investment Returns			Expected Market Return ⁵
	2015	2012	2010	1-Year TWR ³	3-Year TWR ³	SI IRR ⁴	
Buyout	67.8%	74.5%	77.5%	13.6%	16.8%	14.4%	12.5%
Growth Equity / Venture	14.4%	8.5%	7.4%	6.1%	13.8%	9.5%	11.5%
Credit / Special Situations	13.8%	13.5%	11.7%	-4.0%	6.8%	12.0%	10.5%
Emerging Managers	4.1%	3.4%	3.4%	8.3%	11.7%	9.0%	N/A
Private Equity Total	100.0%	100.0%	100.0%	9.6%	14.8%	13.4%	12.0%

¹ State Street as of 12/31/15

² Includes investments approved by Investment Committee through 3/31/16; excludes Emerging Managers

³ State Street as of 3/31/16

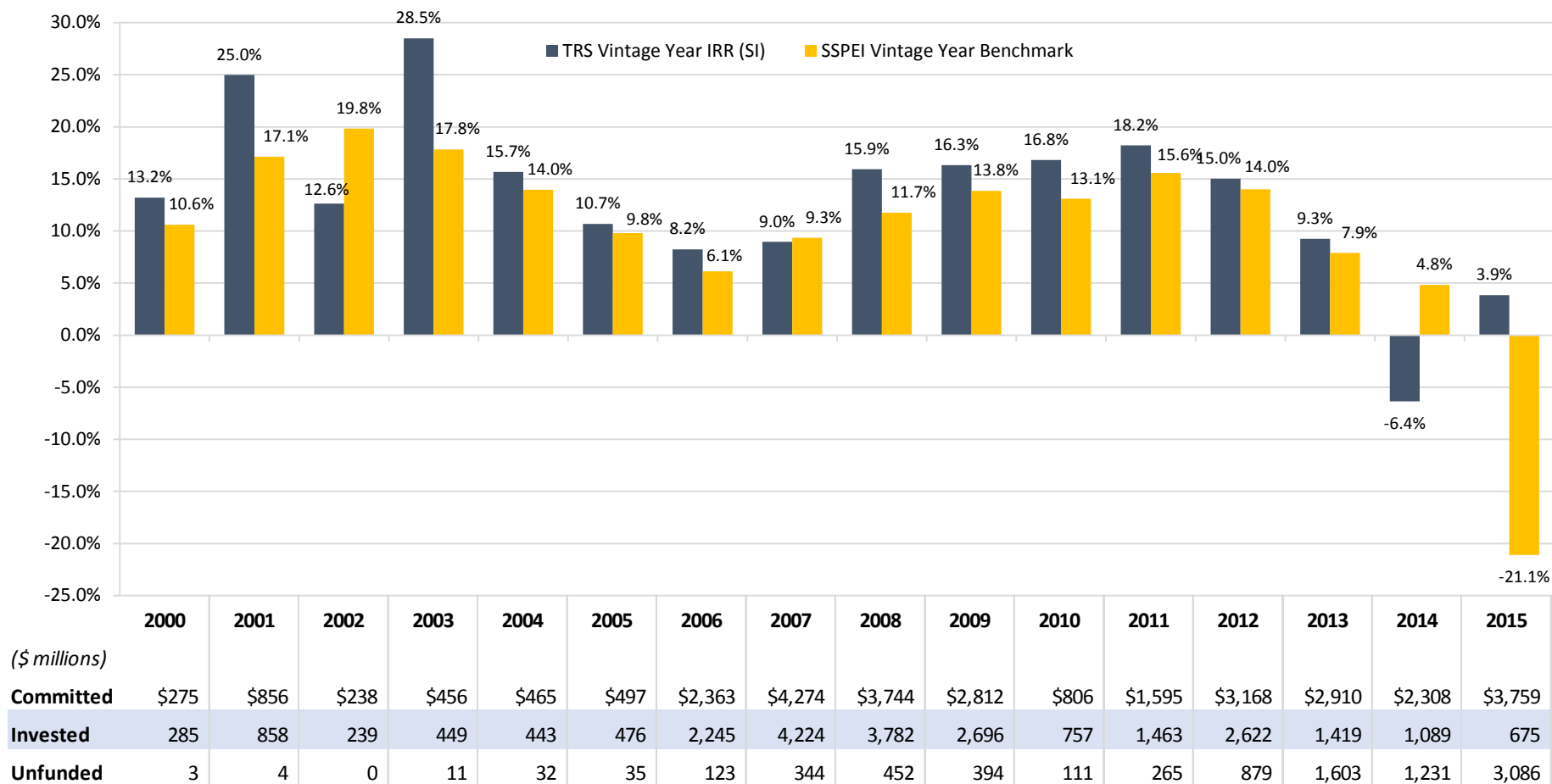
⁴ State Street as of 12/31/15; excludes legacy commitments to Texas Growth Funds and Goldman Sachs Vintage Fund made prior to 2000

⁵ Hamilton Lane

Performance

TRS Vintage Year Comparison

- Outperformed benchmark in 13 of 16 years since 2000



Source: State Street as of 12/31/15, SSPEI as of 12/31/15; excludes Emerging Managers

Performance

PE Principal Investments

- Private Equity has focused on becoming a Preferred Destination for principal investments for our partners
- Committed \$1.2 billion to eight principal investments in 2015
- Approximately \$1.2 billion is projected to be committed in 2016

(\$ millions)

Investment	Number	Total Commitment	Total Funded	Total Distributions	Net Asset Value	SI IRR	Investment Multiple
Total Co-Invest	21	\$1,707	\$1,628	\$733	\$1,592	21.2%	1.4x
Total Direct	2	375	375	128	447	14.3%	1.5x
Total Co-Invest Funds (BlackRock PEP)	3	1,050	557	415	435	21.0%	1.5x
Total Sidecar Funds	4	550	63	0	62	-1.7%	1.0x
TOTAL PRIVATE EQUITY PRINCIPAL INVESTMENTS	30	\$3,682	\$2,624	\$1,276	\$2,536	19.5%	1.5x

Performance

Accomplishments and Priorities

2015 Accomplishments

- Provided 12.0% 10-year return – **#1 in performance in TUCS universe**
- Returned 14.8% and 14.1%, respectively for 3- and 5-year periods – top decile TUCS performance for both periods
- Added 3-year alpha of 351 basis points¹
- Launched TRICOT office
- “Self-funding” portfolio: distributions exceeded contributions by \$1.6 billion in 2015
- Committed \$3.9 billion to 28 investments
 - \$2.6 billion to 14 Premier List Funds
 - \$1.2 billion to 8 Principal Investments²
 - \$146 million to 6 Emerging Manager Funds

2016 Priorities

- Commit up to \$4.6 billion
- Continue Texas Way of investing and communicate process to all GPs
- Complete team hiring and successfully integrate new team members
- Successful roll-out of TRICOT office
- Integrate data analytics within Private Markets
- Continue to be a preferred global destination for large, attractive investments

¹State Street as of 3/31/16

²Includes \$300 million to 2 sidecar investments

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Market Conditions

	Long-Term Average (excl. 2006-2007)	2015 "Today"	2007 "Peak"	2002 "Pre-Peak"
Supply of Capital				
Capital Raised (\$ billions)	\$199	\$293	\$373	\$94
Number of Funds Raised	620	710	810	431
Percent of US GDP	1.4%	1.6%	2.5%	0.8%
Demand for Capital				
Total Value of PE-Backed Buyout Transactions (\$ billions)	\$196	\$265	\$804	\$90
Number of Closed Buyout Deals	872	725	1,502	578
Percent of Transactions > \$1 billion	6.9%	11.2%	12.5%	4.0%
Average LBO Size (\$ millions)	\$222	\$366	\$535	\$156
Largest LBO (\$ millions)	\$9,608	\$12,000	\$43,797	\$4,971
Realizations				
Total Value of PE-Backed Exits (\$ billions)	\$194	\$425	\$298	\$26
Number of Companies	1,029	1,840	1,368	256
Dry Powder				
Total Amount (\$ billions)	\$581	\$825	\$693	\$180
Percent of Dollars Invested	296%	311%	86%	200%
Pricing (EV/EBITDA Multiple)				
Sponsor-Backed Buyouts Average	8.1x	10.3x	9.7x	6.6x
Strategic Buyers Average	8.5x	9.6x	8.7x	7.3x
Public Market Average (MSCI US)	11.1x	12.2x	11.2x	12.0x
Debt				
Debt Availability (1=hard to access; 10=easy to access)	5	7	10	5
Total Leveraged Loan and High Yield Volume (\$ billions)	\$393	\$631	\$562	\$130
Typical Pricing	7.1%	5.4%	8.3%	8.6%
Average Debt/EBITDA Multiple	4.9x	5.7x	6.2x	4.0x
Average % Debt Used in Transactions	63%	60%	69%	63%

Source: Preqin, St. Louis Federal Reserve, Dealogic, S&P LCD, Bloomberg, Credit Suisse

Summary

- Returns
 - 3- and 5-year returns of 14.8% and 14.1%¹
 - Exceeded public markets by 6.5% since 2000, adding \$7.4 billion of value²
 - Principal Investment results have provided significant portfolio alpha
 - Top decile performance in TUCS universe over 3-, 5-, and 10-year horizons
 - Number 1 over the 10-year period
- Diversification
 - Risk and correlations within expectations
- Organization expanding and functioning well
 - Addition of TRICOT office
 - General Partner relationships remain concentrated and highly functional
- Market conditions: Predominantly overvalued from a long-term perspective
- Private Equity allocation below long-term target but achievable plan in place to meet the 13% target in 2018
 - Distributions exceeded contributions in 2015
- Continue to implement Texas Way valuation framework
- Focused on Preferred Destination designation within investment network

APPENDIX

Portfolio Structure

Strategy and Geography

Strategy	Domestic	International Developed	International Emerging	Total			
	Target / Actual	Target / Actual	Target / Actual	Expected Return ¹	Public Risk Proxy ²	Actual	Target
Buyout	40% / 48%	25% / 21%	5% / 2%	12.5%	22.8%	71%	70%
Growth Equity & Venture Capital	8% / 13%	0% / 0%	8% / 2%	11.5%	27.9%	15%	15%
Credit & Special Situations	8% / 12%	5% / 1%	3% / 1%	10.5%	19.1%	14%	15%
Total	55% / 73%	30% / 22%	15% / 5%	12.0%	23.2%	100%	100%

- **Buyout:** Encompasses broad spectrum of small buyout managers to global platforms with >\$100 billion in AUM. Emphasis on managers with substantial operational expertise and ability to generate co-investment
- **Growth Equity & Venture Capital:** Emphasis on larger managers (>\$750 million in fund size) investing in the full range of early stage venture to growth capital
- **Credit & Special Situations:** Managers with expertise spanning liquid trading strategies, mezzanine, distress-for-control, and asset purchases

Note: Table excludes allocation to Emerging Managers

¹Hamilton Lane

²TRS Risk Group

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Real Assets

Grant Walker
Senior Director
June 2016

Agenda

- I. Executive Summary
- II. Organizational Structure
- III. Capital Plan
- IV. Performance
- V. Market Outlook and Conditions
- VI. Summary
- VII. Appendix

Executive Summary

PERFORMANCE			
Asset Class	1-Year Return	3-Year Return	5-Year Return
Real Assets IRR ¹	12.2%	12.9%	12.8%
Real Assets TWR ²	12.9%	12.9%	12.6%
Real Assets Benchmark TWR ²	14.0%	12.8%	12.6%
Real Assets Excess Return TWR	(1.1%)	0.1%	0.0%
TUCS Peer Comparison	31 st	23 rd	17 th

PORTFOLIO GROWTH ³			
Real Assets (\$ millions)	1-Year	3-Year	5-Year
Ending Value	\$17,953	\$17,953	\$17,953
less Starting Value	16,123	13,266	7,654
less Contributions	4,155	9,618	15,077
plus Distributions	4,261	10,622	12,977
Investment Return	\$1,936	\$5,691	\$8,199

LONG-TERM MARKET RETURN AND RISK EXPECTATIONS				
Style	Target Portfolio Weight	Strategic Goal	Expected Market Return ⁴	Public Risk Proxy ⁵
Core	30%	Diversification/Beta/Inflation Protection	7.0%	17.6%
Value-Add	10%	Return Enhancement/Inflation Protection	7.5%	21.8%
Opportunistic	30%	Return Enhancement	10.0%	32.1%
Real Assets Special Situations (RASS)	12%	Relative Value	7.3%	20.5%
Other Real Assets	18%	Inflation Protection	7.0%	17.7%
REAL ASSETS TOTAL	100%	Diversification/Inflation Protection	8.0%	22.0%

ALLOCATION SUMMARY						
Style	% of Portfolio			% of Total Trust		
	12/31/2015	12/31/2014	Change	12/31/2015	12/31/2014	Change
Core	30.8%	30.2%	0.6%	4.6%	3.6%	1.0%
Value-Add	15.1%	13.5%	1.6%	1.7%	1.6%	0.1%
Opportunistic	30.7%	33.1%	-2.4%	4.2%	3.9%	0.3%
Real Assets Special Situations (RASS)	10.9%	10.9%	0.0%	1.5%	1.3%	0.2%
Other Real Assets	10.4%	10.7%	-0.3%	1.4%	1.3%	0.1%
Emerging Managers	2.1%	1.6%	0.5%	0.3%	0.2%	0.1%
REAL ASSETS TOTAL	100.0%	100.0%	-	13.7%	11.9%	1.8%
Target % of Total Trust				16.0%	13.0%⁶	

¹State Street as of 12/31/15

²State Street as of 3/31/16

³State Street as of 12/31/15, excludes ENR

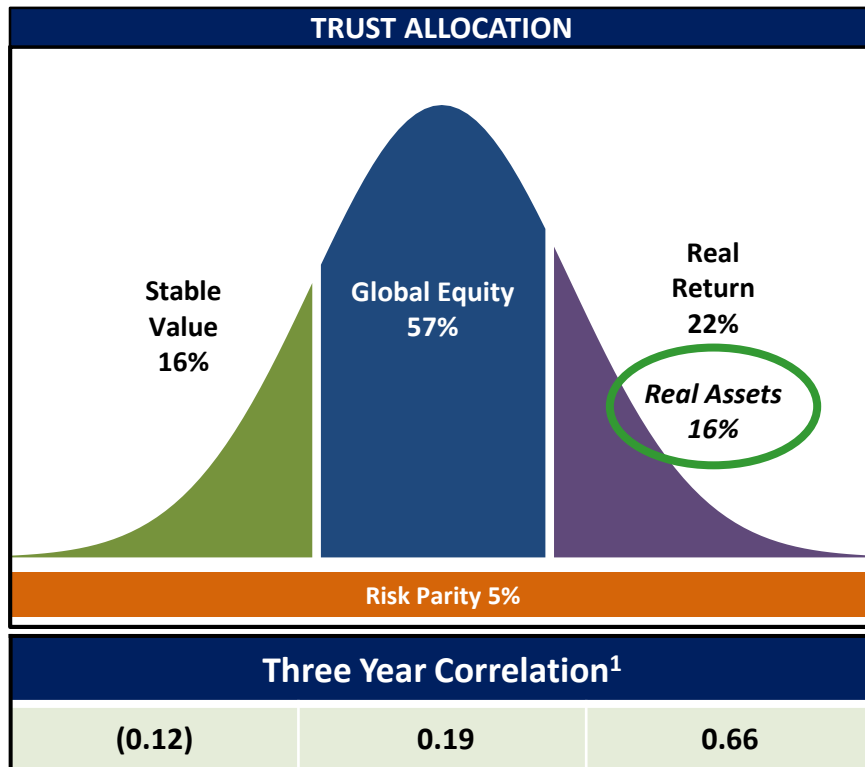
⁴Townsend Group

⁵TRS Risk Group

⁶RA Allocation target increased from 13.0% to 16.0% as of 9/30/14

Executive Summary

Role in the TRS Trust



REAL ASSETS				
Portfolio Target	Target Portfolio Weight	Expected Market Return ²	Volatility	
			Observed ³	Public Risk Proxy ⁴
Core	30%	7.0%	7.4%	17.6%
Value-Add	10%	7.5%	16.3%	21.8%
Opportunistic	30%	10.0%	14.8%	32.1%
RASS	12%	7.3%	19.5%	20.5%
Other Real Assets	18%	7.0%	6.8%	17.7%
Real Assets Total	100%	8.0%	11.6%	22.0%
Performance ⁵	Return	Benchmark	Excess Return	TUCS Rank
1-Year TWR	12.9%	14.0%	(1.1%)	31 st
3-Year TWR	12.9%	12.8%	0.1%	23 rd
5-Year TWR	12.6%	12.6%	0.0%	17 th
Drawdown Risk	Drawdown ⁶			
S&P 500	45.8%			
REITs (MSCI US REITs)	63.8%			
TRS Real Assets ⁷	41.5%			

¹ TRS Risk Group

² Townsend

³ Townsend; TRS real assets portfolio from 12/31/07 through 12/31/15

⁴ TRS Risk Group

⁵ State Street as of 3/31/16

⁶ S&P 500 drawdown date 03/31/09, REITs drawdown date 03/31/09, and TRS Real Assets drawdown date 03/31/10

⁷ Prior to the Global Financial Crisis, the largest drawdown was 0.9% (12/31/06, during the ramp up of the RA portfolio)

Real Assets Organization Chart



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BA UC Davis

Advisors and Consultants
Townsend Group and LaSalle

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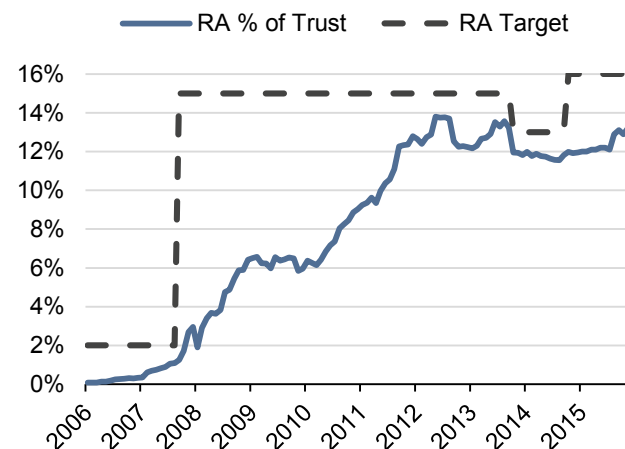
Performance

Asset Growth, Allocation, and Returns

Growth (\$ millions) ¹	1-Year	3-Year	5-Year
Ending Value	\$17,953	\$17,953	\$17,953
less Starting Value	16,123	13,266	7,654
less Contributions	4,155	9,618	15,077
plus Distributions	4,261	10,622	12,977
Investment Return	\$1,936	\$5,691	\$8,199

Premier List Investments ²	Total	Committed Since 1/2015	Committed Since 1/2012
Number of Premier Managers	40	16	28
Percent Committed in Funds	72%	68%	72%
Percent Committed in Principal Investments	28%	32%	28%

Real Assets % of Trust



Style	TRS Leverage ³	Typical Leverage	Allocation			Investment Returns (TWR) ⁴			Expected Market Return ⁵
			2015	2012	2010	1-Year	3-Year	5-Year	
Core	33.0%	25% - 50%	30.8%	31.4%	29.7%	16.4%	13.9%	14.1%	7.0%
Value Added	46.5%	40% - 65%	15.1%	13.7%	10.5%	13.1%	15.4%	17.0%	7.5%
Opportunistic	41.8%	55% - 80%	30.7%	34.5%	35.3%	11.6%	12.4%	10.8%	10.0%
RASS	51.8%	Varies	10.9%	9.8%	13.8%	8.6%	11.4%	14.7%	7.3%
Other Real Assets	27.2%	< 70%	10.4%	9.8%	10.7%	11.2%	10.9%	8.9%	7.0%
Emerging Managers	29.8%	70%	2.1%	0.7%	NA	16.9%	14.4%	N/A	10.0%
Real Assets Total	40.3%		100.0%	100.0%	100.0%	12.9%	12.9%	12.6%	8.0%

¹State Street as of 12/31/15

²Includes investments approved by Investment Committee through 3/31/16; excludes Emerging Managers and SPN fund investments

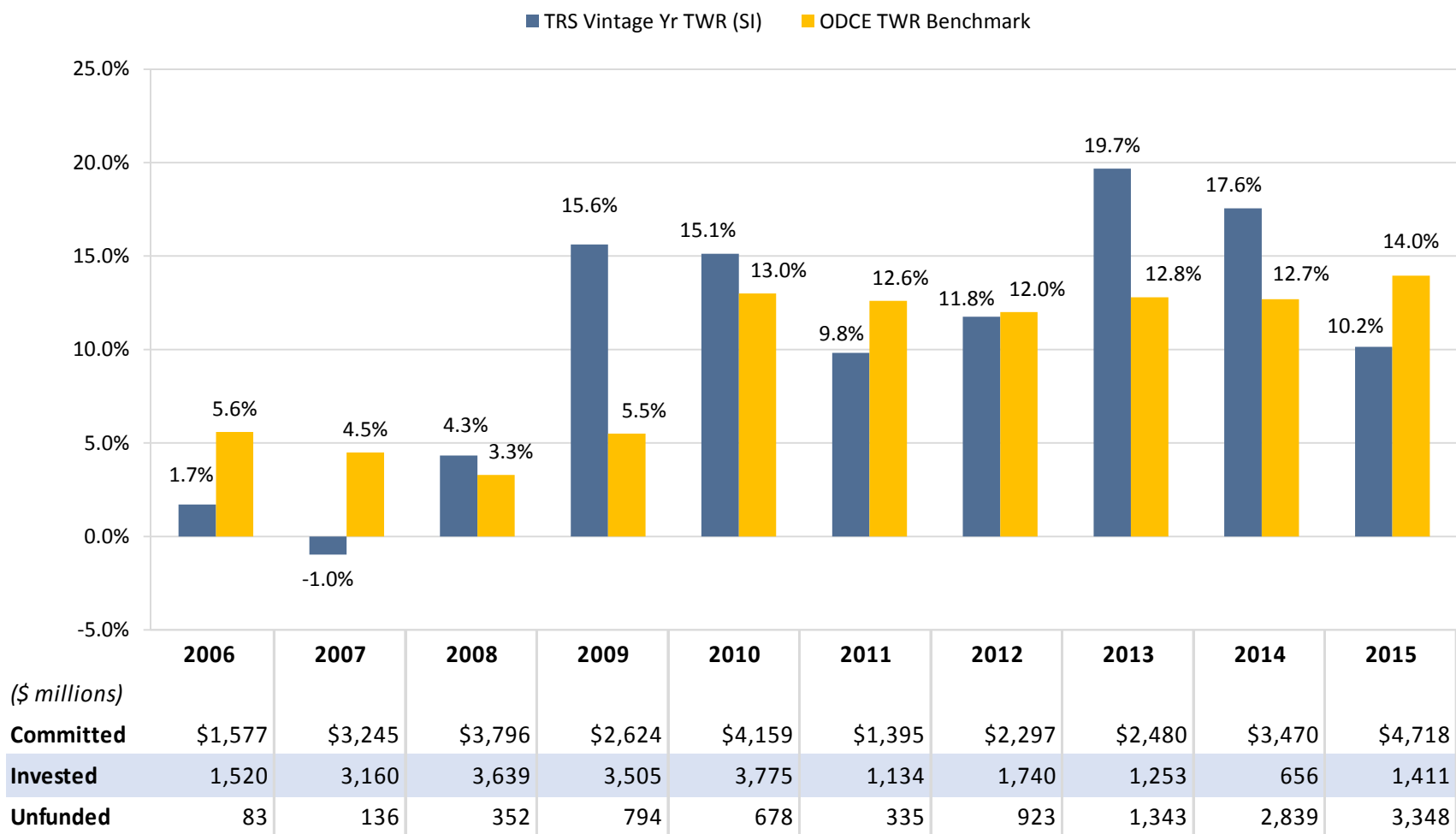
³Townsend Group as of 9/30/15

⁴State Street as of 3/31/16

⁵Townsend Group

Performance

TRS Vintage Year Comparison



Source: State Street and ODCE as of 12/31/2015

Performance

RA Principal Investments

- Real Assets has focused on becoming a Preferred Destination for principal investments with our partners (*refer to the Appendix for a detailed explanation of Principal Investment types*)
- Committed approximately \$2.2 billion to principal investments (including sidecars) in 2015
- \$1.0 billion is projected to be committed in 2016

(\$ millions)

Investment	Number	Total Commitment	Total Funded	Total Distributions	Net Asset Value	SI IRR	Investment Multiple
Total Direct	10	\$2,537	\$1,628	\$1,240	\$1,201	20.9%	1.4x
Total Co-Invest	14	1,541	1,387	660	1,002	9.4%	1.2x
Total Co-Invest Funds (Ranger)	3	875	479	490	215	21.3%	1.4x
Total Single LP	14	2,900	3,695	2,709	2,111	15.4%	1.3x
Total Sidecar	13	1,265	686	452	445	19.7%	1.3x
TOTAL REAL ASSETS PRINCIPAL INVESTMENTS	54	\$9,119	\$7,875	\$5,551	\$4,973	16.4%	1.3x

Performance

Accomplishments and Priorities

2015 Accomplishments

- 12.8% return over 5 years
 - Well above long-term target
- Top quartile amongst peers over a 3- and 5- year period
- Highest returning portfolio for the Trust in 2015
- Committed approximately \$4.7 billion to 22 investments
 - \$3.0 billion to 14 Premier List funds (including Sidecars and SPNs)
 - \$1.7 billion to 9 Principal Investments
- Hired and successfully integrated 4 team members into Real Assets
- Launched TRICOT office
- Implemented Texas Way standardized valuation process

2016 Priorities

- Researching better RA performance benchmark structure that more accurately reflects the composition of our portfolio
- Modify role of Infrastructure in Real Assets portfolio
- Commit up to \$4.1 billion
- Continue Texas Way of investing and communicate process to all GPs
- Successful roll-out of TRICOT office
- Continue to be a preferred global destination for large, attractive investments

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Market Conditions

Domestic Only

	10-Year Average	2015 "Today"	2009 "Trough"	2007 "Peak"	2004 "Pre-Peak"
Fundraising					
Number of Funds Raised	139	115	101	160	94
Fund Capital Raised (\$ billion)	\$52	\$73	\$26	\$61	\$27
Dry Powder (\$ billion)	\$92	\$119	\$95	\$84	\$37
REIT Capital Offerings (\$ billion)	\$51	\$59	\$35	\$36	\$39
Transactions					
All Transaction Volume (\$ billion)	\$326	\$539	\$69	\$573	\$370
% of US GDP	2.1%	3.0%	0.5%	4.0%	2.8%
Cross-Border Trans. Volume (\$ billion) ¹	\$36	\$95	\$5	\$48	\$25
Cross-Border Share of All Transactions ¹	11%	18%	7%	8%	7%
Pricing					
Transactional Cap Rates – All RE	6.9%	6.5%	7.4%	6.7%	7.5%
Institutional Implied Core Cap Rates	5.5%	4.7%	6.5%	5.1%	6.9%
Inst. Cap Rate Spread to UST	2.4%	2.6%	3.3%	0.5%	2.7%
Debt					
CMBS Issuance	\$82	\$101	\$3	\$229	\$93
Average Percent Debt	60% - 70%	60% - 70%	65% - 70%	65% - 85%	65% - 70%
Availability (1=hard to access; 10=easy)	6	7	2	10	5
Terms	NA	Normal Standards	Tight Standards	Covenant Light	Normal Standards
Interest Rate	4.25% - 6.25%	3.25% - 5.25%	5.0% - 7.0%	4.5% - 6.5%	4.5% - 6.5%

Source: NCREIF, Real Capital Analytics, Jones Lang LaSalle (JLL), Preqin

¹ Foreign buyers

Summary

- Real Estate returns have been strong and achieved top quartile results over the past 5 years
 - Preferred general partnership relationships consolidated
 - Principal investment sourcing and capabilities now robust
- Diversification has been excellent
- Real Assets team is fully staffed and operating well
- Market conditions are no longer undervalued
- Currently projected to reach 16% of the Trust (Policy Target) around 2019
- Evaluate the role of infrastructure in the RA portfolio
- Continue to implement Texas Way Valuation framework
- Focused on Preferred Destination designation within investment network

APPENDIX

Portfolio Structure

Primary Objectives

- Provide alpha to the Trust
- Portfolio is a partial hedge to inflationary environments and diversifier to the Trust
- Maintain neutral target allocation of the Trust
- First quartile performance

Methods Employed

- Bottom-up portfolio allocation framework based on various styles
- Top-down long-term funding plan
- Core Real Estate and Infrastructure styles are the foundation of the portfolio structure
- Value investor based on market environment

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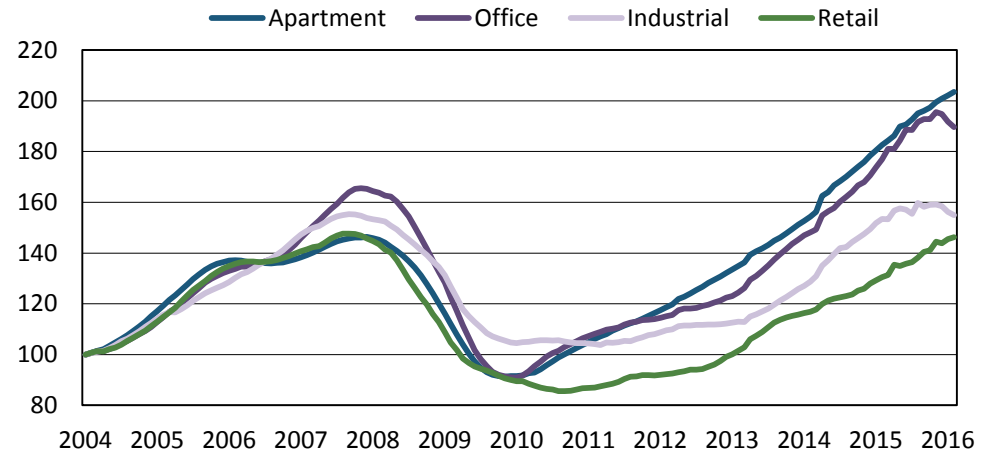
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Market Conditions

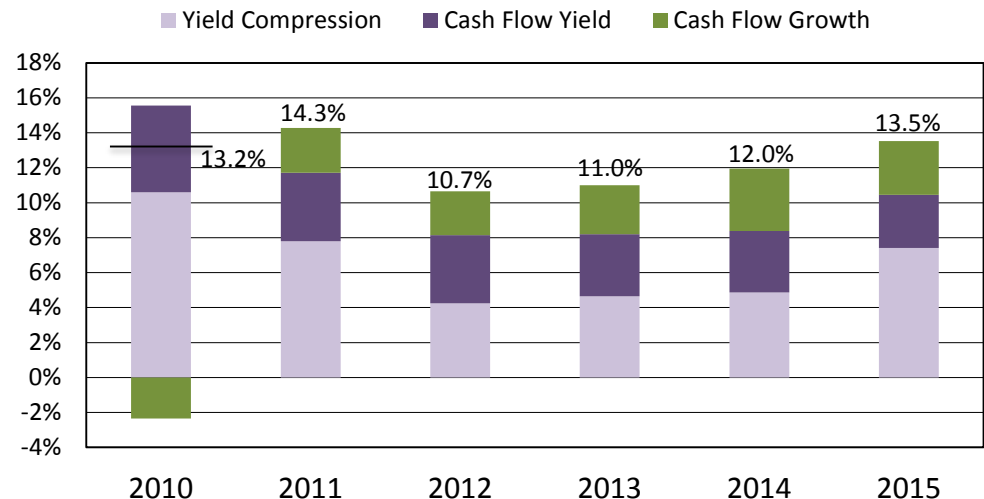
Domestic Only

- Average commercial property values are now 16% above the 2007 peak
- Urban apartment and office assets have significantly outperformed
- There are wide value disparities depending on location, property type and asset quality
- U.S. real estate returns have remained consistently high throughout the recovery
- However, the drivers of returns will change as yields stop compressing or even expand
- Preliminary 1Q16 core real estate returns were the lowest in six years, indicating that the deceleration may have begun

Real Capital Analytics U.S. Commercial Property Price Index



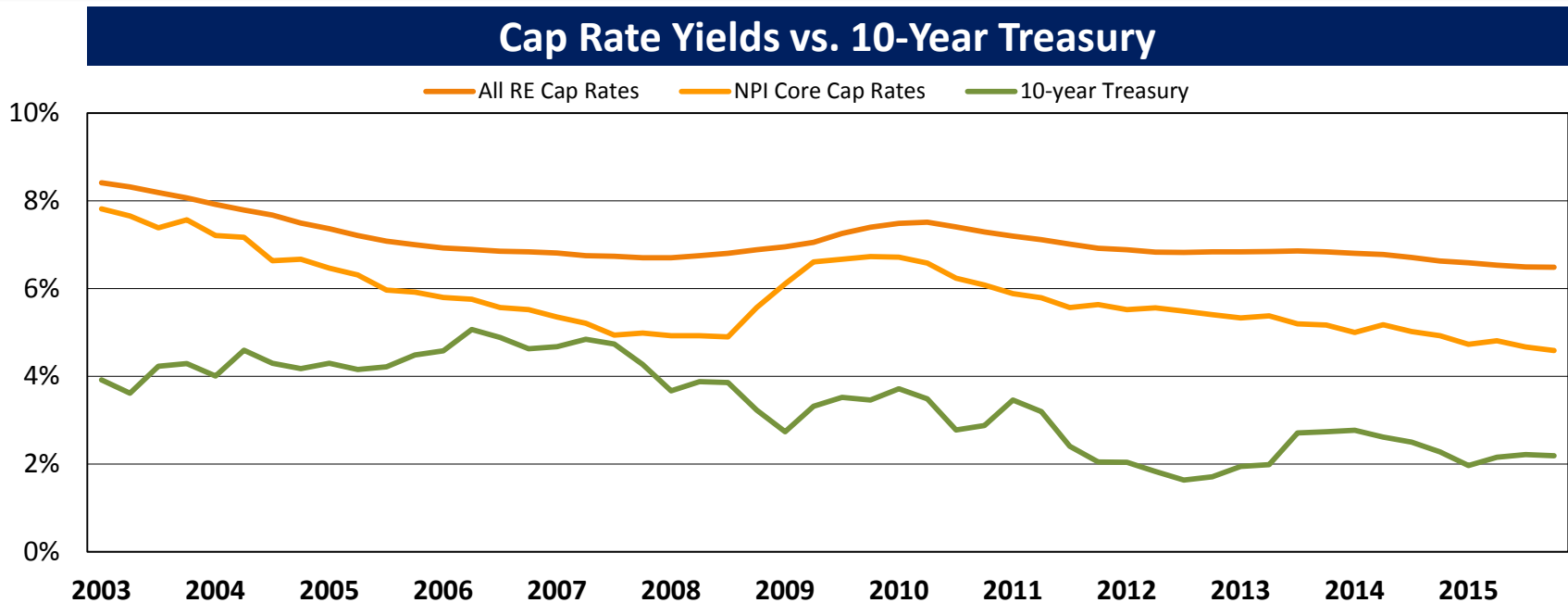
NCREIF-ODCE Unlevered Return Attribution



Source: Real Capital Analytics; NCREIF

Market Conditions

Domestic Only



- Cap rates have reached all-time lows as 10-year Treasury yields remain depressed
- Gap continues to widen between cap rates for institutional-quality assets and the rest of the commercial real estate universe
- This indicates a still-growing institutional appetite for real assets
 - Cross-border flows into the U.S. increased by 104% in 2015, driving core yields downward

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Real Asset Strategy Definitions

Core

- Institutional quality, best-located and best-leased assets in the market in each of the traditional property types (office, multifamily, retail, industrial)
- Leverage limit is 50% loan-to-value (LTV)

Value-Add

- Return-enhancing strategies executed at the property level designed to enhance value through execution of one or more of the following strategies: lease-up, rehabilitation, repositioning
- Typical leverage is 50% to 65% LTV

Opportunistic

- Broad range of risk and return via opportunity funds, specialized investments, and mezzanine debt or equity with the majority of strategies involving some level of development or distress
- Leverage is usually 70% LTV and higher

Real Assets Special Situations (RASS)

- Publicly traded shares of listed REITs (Real Estate Investment Trusts) and REOCs (real estate operating companies) or other real asset related entities, public or private real asset debt

Other Real Assets (ORA)

- Infrastructure, shipping, land, and other opportunistic investments providing value enhancement with relatively low expected volatility

Types of Principal Investments

Co-Investment (Alongside a Fund)	Direct (Two Types)	Single Limited Partnership (LP) Fund	Sidecar (Two Types)
<p>What: A specific investment opportunity that is brought to TRS by an existing manager</p> <p>Why: Manager needs more capital than is available in the main fund (due to size, concentration, etc.)</p> <ul style="list-style-type: none"> • TRS equity invests alongside main fund and GP serves as fiduciary of the co-investment vehicle • RA terms are usually negotiated as half (50% discount) compared to the main fund fees/promote, PE terms are '0%/0%' • Typically in/out on same timing & terms as GP 	<p>What: A specific investment that can be underwritten and evaluated immediately</p> <p>Why: Allows TRS to capitalize on a specific investment opportunity in real-time</p> <p><u>With a Manager</u></p> <ul style="list-style-type: none"> • Majority of capital comes from TRS • TRS underwrites the investment alongside manager • Unlike a Co-Investment – TRS may have the ability to control hold period and exit decision <p><u>Without a Manager</u></p> <ul style="list-style-type: none"> • All capital comes from TRS • TRS underwrites the investment and receives a prudent investor letter from external advisors • Unlike a Co-Investment – TRS has ability to control hold period and exit decision 	<p>What: Fund created with a specific strategy to invest over an Investment period. No pre-specified assets.</p> <p>Why: Create a vehicle to target a specific strategy and invest over a period of time</p> <ul style="list-style-type: none"> • Usually 100% TRS capital • TRS has opt-out rights (negative control) and reviews each investment • Can be open-ended and recycle capital • Terms are market driven (but less than a commingled fund) • TRS has ability to control hold period and exit decision 	<p>What: Fund created alongside a main fund</p> <p>Why: Fees and/or promote are lower than main fund and negotiated in advance</p> <p><u>TRS Control (PI)</u> – TRS has opt-out rights and more control over which deals are put into the sidecar</p> <ul style="list-style-type: none"> • TRS controls decision to invest in a specific investment alongside the fund • Gives manager pre-committed co-investment capital for deals with short time-lines <p><u>Manager Controlled (Non-PI)</u> – Manager has discretion for when to allocate sidecar capital to opportunities – either pro-rata in every deal or manager drives investment decision</p> <ul style="list-style-type: none"> • Purpose: Lower overall blended fee drag for TRS



Energy & Natural Resources

Carolyn Hansard
Senior Investment Manager
June 2016

Agenda

- I. Executive Summary
- II. Organizational Structure
- III. Capital Plan
- IV. Performance
- V. Market Outlook and Conditions
- VI. Summary
- VII. Appendix

Executive Summary

PERFORMANCE				PORTFOLIO GROWTH ⁴		
Asset Class	1-Year Return	3-Year Return	5-Year Return	ENR (\$ millions)	1-Year	3-Year
Energy Natural Resources IRR ¹	-16.6%	-5.1%	-2.1%	Ending Value	\$2,112	\$2,112
Energy Natural Resources TWR ²	-15.3%	N/A	N/A	less Starting Value	2,228	1,713
ENR Benchmark ³	-21.0%	-8.0%	-1.4%	less Contributions	933	2,032
ENR Excess Return IRR	4.4%	2.9%	-0.7%	plus Distributions	661	1,327
CPI	1.6%	1.3%	1.7%	Investment Return	(\$388)	(\$306)

LONG-TERM MARKET RETURN AND RISK EXPECTATIONS				
Style	Target Portfolio Weight	Strategic Goal	Expected Market Return ⁵	Public Risk Proxy ⁶
Resources – Core	16%	High Inflation Beta	10.0%	15.4%
Resources – Value Add	32%	High Inflation Beta	12.0%	30.7%
Resources – Opportunistic	32%	High Inflation Beta	14.0%	42.8%
ENR Infra – Value Add	10%	Low Inflation Beta	11.0%	12.0%
ENR Infra – Opportunistic	10%	Low Inflation Beta	14.0%	22.3%
ENR TOTAL	100%	Diversification	12.0%	26.2%

ALLOCATION SUMMARY						
Style	% of Portfolio			% of Total Trust		
	12/31/2015	12/31/2014	Change	12/31/2015	12/31/2014	Change
Resources – Core	24.3%	36.1%	-11.8%	0.4%	0.6%	-0.2%
Resources – Value Add	18.2%	13.5%	4.7%	0.3%	0.2%	0.1%
Resources – Opportunistic	32.9%	26.7%	6.2%	0.5%	0.5%	0.1%
ENR Infra – Value Add	12.1%	16.7%	-4.6%	0.2%	0.3%	-0.1%
ENR Infra – Opportunistic	11.2%	6.1%	5.1%	0.2%	0.1%	0.1%
Emerging Managers	1.2%	0.9%	0.3%	0.0%	0.0%	0.0%
ENR TOTAL	100.0%	100.0%	-	1.7%	1.7%	0.0%
Target % of Total Trust				3.0%	3.0%	

¹State Street as of 12/31/15. ENR officially became a portfolio 10/1/13. IRR calculated from first ENR investments at 10/28/04.

²State Street as of 3/31/16

³75% Cambridge Natural Resources Index (reweighted), 25% CPI

⁴State Street as of 12/31/15. ENR officially became a portfolio 10/1/13. IRR calculated from first ENR investments at 10/28/04.

⁵Hamilton Lane

⁶TRS Risk Group

Executive Summary

Role in the TRS Trust

TRUST ALLOCATION

Stable
Value
16%

Global Equity
57%

Real
Return
22%

Energy & Natural
Resources
3%

Risk Parity 5%

Three Year Correlation¹

(0.28)

0.54

0.34

ENERGY AND NATURAL RESOURCES

Portfolio Target	Target Portfolio Weight	Expected Market Return ²	Inflation Beta	Volatility	
				Observed ³	Public Risk Proxy ³
Resources – Core	16%	10%	>1	14.5%	15.4%
Resources – Value Add	32%	12%	>1	15.8%	30.7%
Resources – Opportunistic	32%	14%	>1	15.8%	42.8%
ENR Infra – Value Add	10%	11%	0.5>beta<1	17.1%	12.0%
ENR Infra – Opportunistic	10%	14%	0.5>beta<1	30.6%	22.3%
ENR Total	100%	12.0%	Target >1	12.0%	26.2%
Policy Benchmark					
Performance ⁴	IRR	TWR	Benchmark		
1-Year Return	-16.6%	-15.3%	-21.0%		
3-Year Return	-5.1%	NA	-8.0%		
5-Year Return	-2.1%	NA	-1.4%		
Drawdown Risk	Drawdown ⁵				
S&P 500	45.8%				
S&P 500 Energy Sector	56.0%				
ENR Benchmark	30.9%				
Cambridge Re-Weight	39.7%				



¹TRS Risk Group

²Hamilton Lane

³TRS Risk Group

⁴ENR officially became a portfolio 10/1/13. IRR goes back to first investment in portfolio at 10/28/04. IRR and TWR from State Street 12/31/15 and 3/31/16, respectively.

⁵S&P 500 drawdown date 03/31/09, S&P 500 Energy Sector drawdown date 3/31/09; ENR Benchmark & Cambridge Re-Weighted Index drawdown date 12/31/15

Energy & Natural Resources Organization Chart



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Sr. Analyst
BBA Texas State
MBA UT Austin

Advisors and Consultants

Hamilton Lane (Fund Advisors)
Tudor Pickering & Holt (Principal Investments)

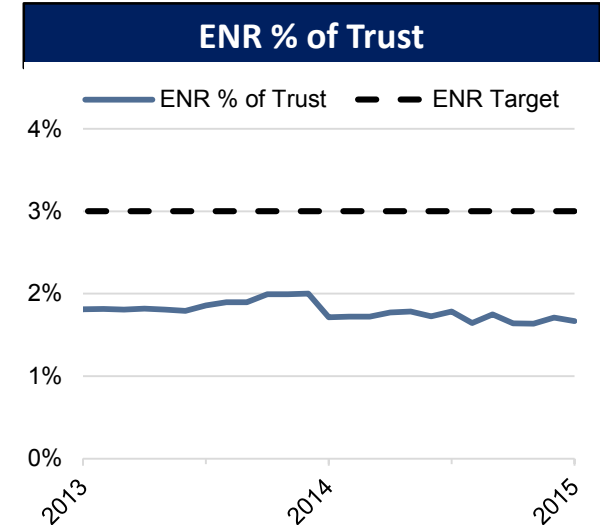
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Performance

Asset Growth, Allocation, and Returns

Growth (\$ millions) ¹	1-Year	3-Year
Ending Value	\$2,112	\$2,112
less Starting Value	2,228	1,713
less Contributions	933	2,032
plus Distributions	661	1,327
Investment Return	(\$388)	(\$306)

Premier List Investments ²	Total	Committed Since 1/2015	Committed Since 1/2012
Number of Premier Managers	25	8	13
Percent Committed in Funds	72%	69%	64%
Percent Committed in Principal Investments	28%	31%	36%

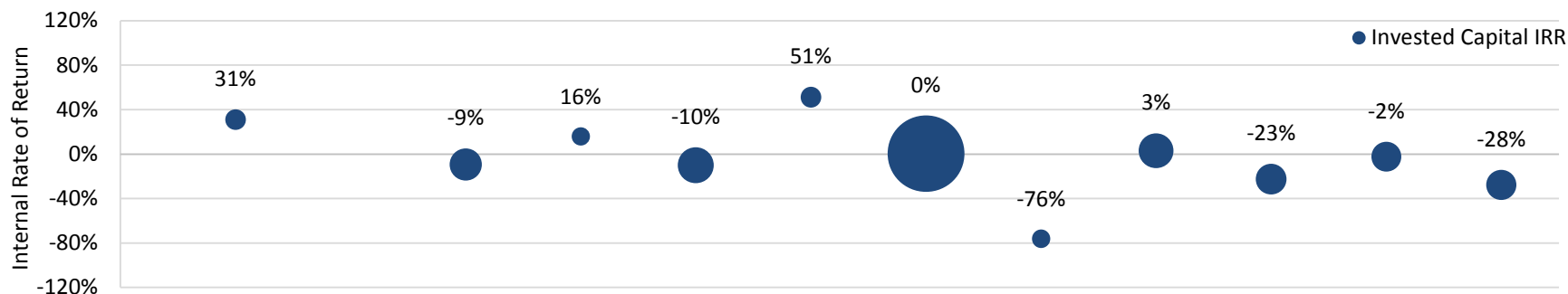


Style	Allocation			Investment Returns (IRR) ³			Expected Market Return ⁴
	2015	2012	2010	1-Year	3-Year	SI	
Resources – Core	24.3%	26.6%	16.1%	-13.9%	-8.0%	-10.2%	10.0%
Resources – Value Add	18.2%	14.7%	68.0%	-19.6%	-8.0%	-2.2%	12.0%
Resources – Opportunistic	32.9%	42.0%	0.0%	-31.9%	-21.9%	-8.4%	14.0%
ENR Infra – Value Add	12.1%	10.8%	5.2%	3.8%	32.9%	26.2%	11.0%
ENR Infra – Opportunistic	11.2%	5.2%	10.7%	8.9%	25.7%	44.9%	14.0%
Emerging Managers	1.2%	0.7%	0.0%	0.4%	0.5%	-0.4%	N/A
ENR Total	100.0%	100.0%	100.0%	-16.6%	-5.1%	-0.6%	12.0%

Performance

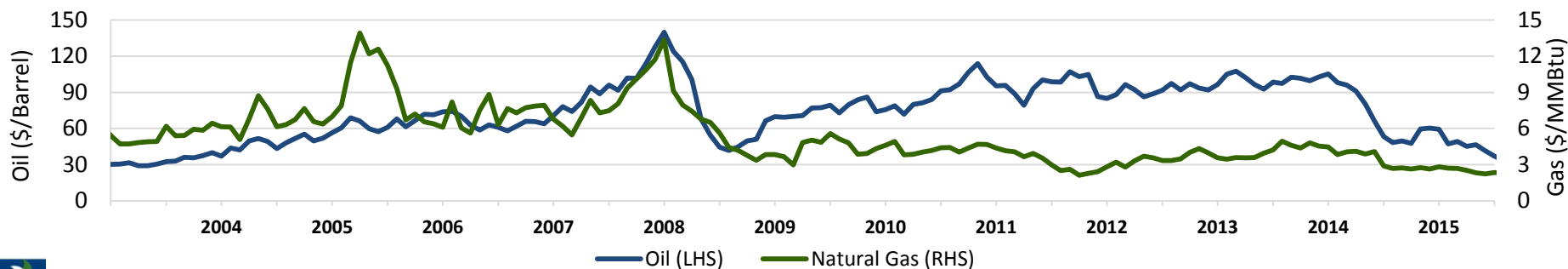
TRS Vintage Year Comparison

Return on Capital Invested by Vintage Year



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
(\$ millions)												
Committed	\$125	\$0	\$300	\$100	\$350	\$125	\$1,800	\$100	\$515	\$750	\$1,215	\$1,563
Invested	125	0	307	100	384	128	1,746	100	361	280	264	269
Unfunded	0	0	0	0	0	0	54	0	154	470	951	1,294

Historical Oil and Natural Gas Price



Source: State Street as of 12/31/15, Cambridge Associates

Performance

ENR Principal Investments

- ENR has focused on becoming a Preferred Destination for principal investments with our partners
- Committed \$465 million to 3 principal investments in 2015
- Approximately \$150 million is projected to be committed in 2016

(\$ millions)

Investment	Number	Total Commitment	Total Funded	Total Distributions	Net Asset Value	SI IRR	Investment Multiple
Total Co-Invest	5	\$315	\$200	\$11	\$78	-26.4%	0.7x
Total Direct	1	400	400	290	375	15.6%	1.3x
Total Co-Invest Funds (TPH Whipstock)	2	300	129	1	125	-3.4%	1.0x
Total Single LP and Sidecar Funds	4	900	288	517	121	39.8%	1.6x
TOTAL ENR PRINCIPAL INVESTMENTS	12	\$1,915	\$1,017	\$819	\$699	16.7%	1.3x

Performance

Accomplishments and Priorities

2015 Accomplishments

- Completed \$1.6 billion of commitments, of which \$465 million were in Principal Investments
- Conducted roundtable of leading energy investors to understand market environment
- Enhanced commodity hedging analytics in due diligence and investment monitoring
- Implemented a solution to gather ENR-specific portfolio company level data and integrate into TRS analytics software (eFront)
- Launched TRICOT office
- Managed Energy Task Force across the Trust to assess investment opportunities in energy dislocation

2016 Priorities

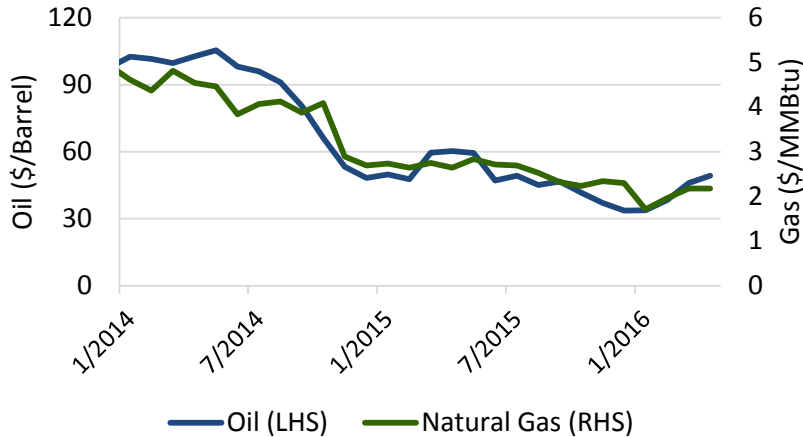
- Execute into energy dislocation
- Continue Texas Way of investing
- Enhance basin level technical and economic modeling for principal investments
- Integrate portfolio level data analytics
- Modify role of Infrastructure in ENR portfolio
- Successful roll-out of TRICOT office
- Continue to be a preferred global destination

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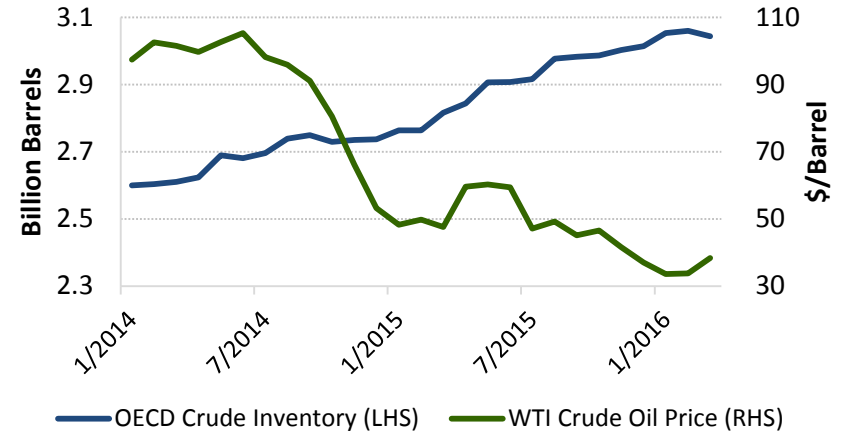
Market Conditions

Energy Industry Update

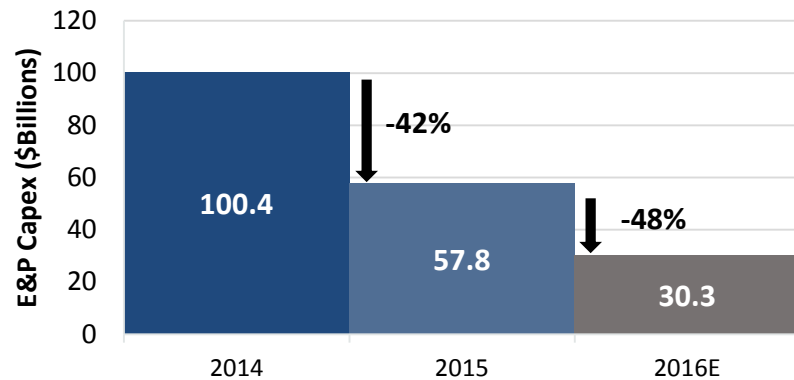
WTI Oil Shows Signs of Recovery while Gas is Still Uncertain



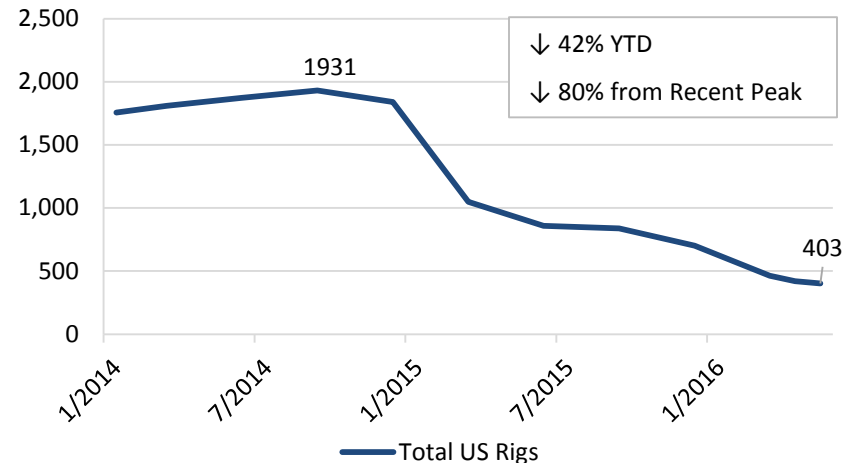
Rising Crude Inventories Show Supply/Demand Imbalance



E&P Drilling Capex Continues to Decline



US Rig Count Significantly Decreased

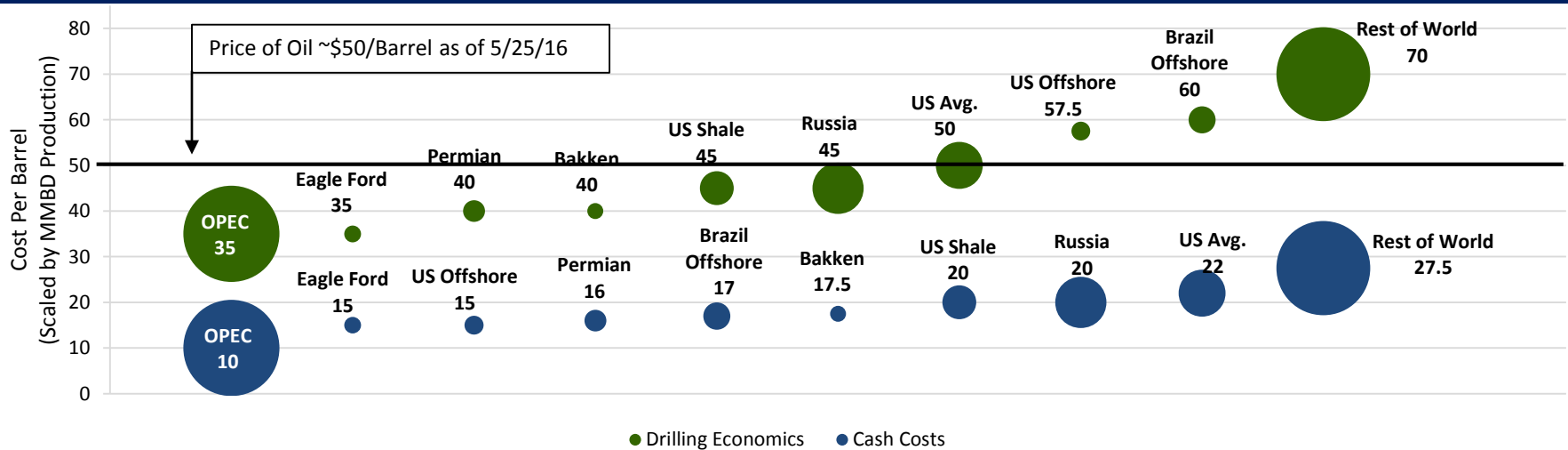


Market Conditions

Energy Industry Update

- Cash costs of existing global production are economic at current oil prices
- At current prices, 60% of global supply have economics that not justify reinvestment
- Oil price of \$50/bbl is threshold price for increased capital spending in the US

Global Oil Production Economics¹



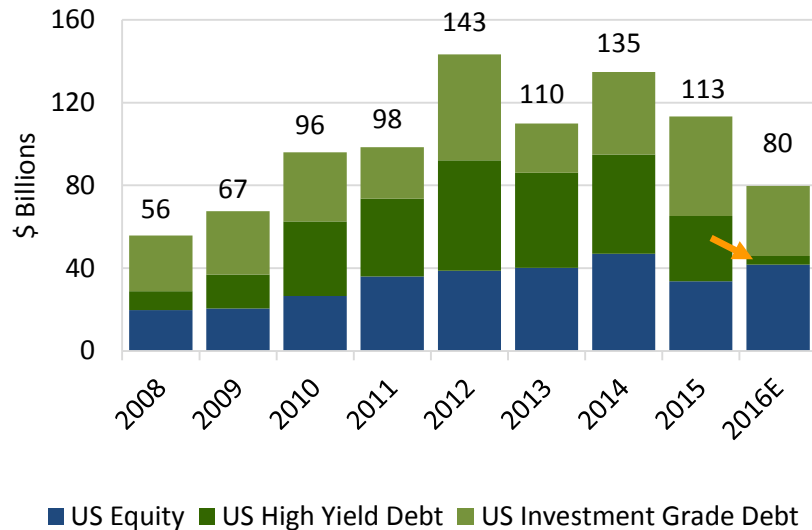
¹Tudor, Pickering, Holt & Co. Assumptions: Cash Costs oil prices are at levels necessary to generate an internal rate of return of 0%. Drilling Economics are the prices required to generate an internal rate of return of 10%.

Market Conditions

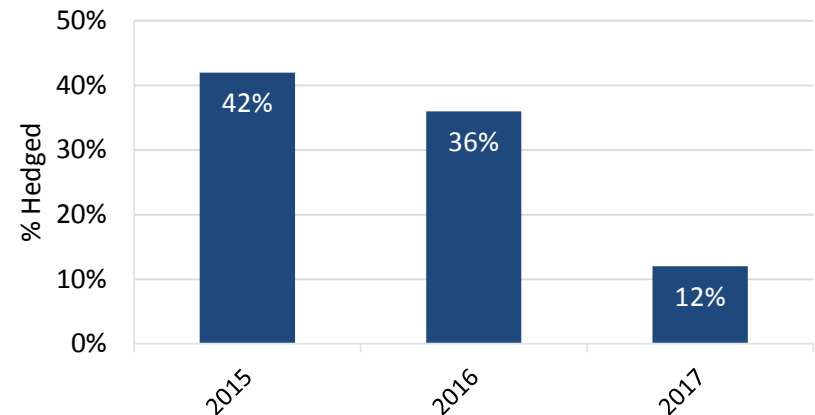
Energy Financial Market Update

- Energy company liquidity pressures continue to accelerate
- US Exploration and midstream development was largely financed through the capital markets and bank lending
- Reserve-based lending has decreased by an average of 20% as banks are under pressure to reduce lending to the sector
- As hedges roll off, producers will become more cash constrained and will seek other sources of funding

Capital Market Issuance has Declined



Hedges Rolling Off

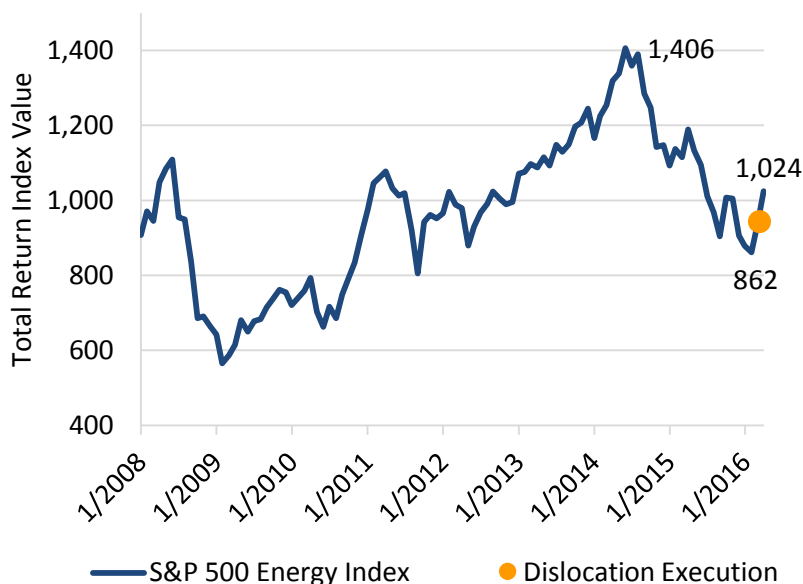


Market Conditions

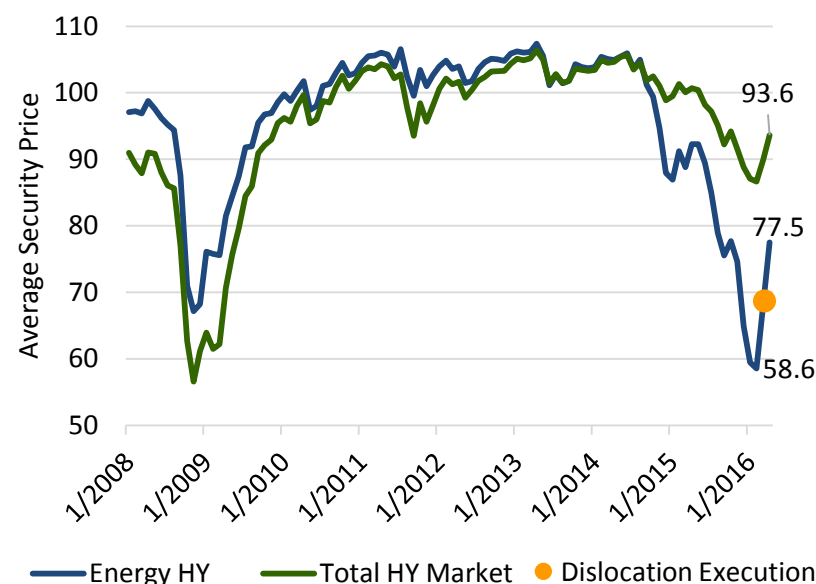
ENR Dislocation Investments

- ENR made two “small boat” investments in the energy market
 - Equity portfolio, managed by Tudor Pickering Holt, is comprised of firms assessed as “powerhouse” or high quality acquisition targets
 - Credit portfolio, managed by Neuberger Berman, is comprised of higher quality securities in the high yield universe
- Portfolios are performing in line with expectations

Public S&P 500 Energy Equity Performance



Energy High Yield Avg Price Relative to High Yield Market



Summary

- Energy-related upstream investments have been negatively impacted by the decline in energy prices
 - Portfolio diversification provided downside protection
 - ENR principal investments added significant alpha
- Energy markets are experiencing cyclical correction
 - ENR portfolio has significant dry powder to invest as markets recover
 - Investment pace is uncertain
- ENR took advantage of dislocation and deployed opportunistic capital in both public equities and credit
- Modify role of infrastructure in ENR portfolio
- Continue to implement Texas Way valuation framework

APPENDIX

Energy & Natural Resources Styles

Returns		4%-8%	10%	11%-12%	14%
Inflation Sensitivity	High (Inflation Beta > 1.0)		Resources – Core	Resources – Valued Add	Resources - Opportunistic
	Medium (0.5<Inflation Beta<1.0)			ENR Infra – Value Add	ENR Infra – Opportunistic
			16% / 25% Target/Current Agriculture Timber Proven Reserves	32% / 18% Target/Current Enhanced Reserves Energy Financing Aggregates	32% / 33% Target/Current Upstream PE Services & Tech
				10% / 12% Target/Current Contracted Midstream Power Generation MLPs Refining	10% / 11% Target/Current Midstream and Power Development

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