



# INVESTMENT MANAGEMENT COMMITTEE



**September 2014**

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

*(Committee Chair and Members are Subject to Change at the September Board Meeting  
Mr. Barth, Committee Chair; Mr. Colonna; Mr. Corpus; Mr. Kelly; & Ms. Sissney,  
Committee Members)*

**AGENDA**

**September 18, 2014 – 2:00 p.m.  
TRS East Building, 5<sup>th</sup> Floor, Boardroom**

*The September 18, 2014 meeting of the Investment Management Committee and TRS Board of Trustees will be held by telephone conference call as authorized under Texas Government Code Section 551.130. The Board intends to have a quorum physically present at the following location: **1000 Red River Austin, Texas 78701 in the TRS East Building, 5<sup>th</sup> Floor, Boardroom.***

1. Consider the approval of the proposed minutes of the June 5, 2014 committee meeting – Committee Chair.
2. Public Strategic Partnership Network Update – David Veal and Grant Birdwell.
3. Receive a review of the External Public Markets Portfolio – Dale West, Susanne Gealy, and Brad Gilbert.

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

June 5, 2014

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on June 5, 2014 in the boardroom located on the Fifth Floor of the TRS East Building offices at 1000 Red River Street, Austin, Texas. The following committee members were present:

Todd Barth, Chair  
Joe Colonna  
David Corpus  
David Kelly  
Nanette Sissney

### Others present:

Christopher Moss, TRS Trustee  
Anita Palmer, TRS Trustee  
Karen Charleston, TRS Trustee  
Brian Guthrie, TRS  
Ken Welch, TRS  
Amy Barrett, TRS  
Carolina de Onis, TRS  
Britt Harris, TRS  
Howard Goldman, TRS  
Jerry Albright, TRS  
Lane Arnold, TRS  
Sylvia Bell, TRS  
Ronnie Bounds, TRS  
Vaughn Brock, TRS  
Deanna Buck, TRS  
Chi Chai, TRS  
Dennis Gold, TRS  
Janis Hydak, TRS  
Dan Junell, TRS  
Eric Lang, TRS  
Lynn Lau, TRS  
Scot Leith, TRS  
Allen MacDonell, TRS

Shayne McGuire, TRS  
Hugh Ohn, TRS  
Mike Pia, TRS  
Rhonda Price, TRS  
Neil Randall, TRS  
Sharon Toalson, TRS  
David Veal, TRS  
Courtney Villalta, TRS  
Susan Wade, TRS  
Grant Walker, TRS  
Tim Wei, TRS  
Jennifer Wenzel, TRS  
Dale West, TRS  
Nathan Zinn, TRS  
George Roberts, KKR  
Dr. Keith Brown, Investment Advisor  
Steven Huff, Fiduciary Counsel  
Brady O'Connell, Hewitt EnnisKnupp  
Steve Voss, Hewitt EnnisKnupp  
Ann Fickel, Texas Classroom Teachers Association  
Philip Mullins, Texas State Employees Union  
Tom Rogers, Texas Retired Teachers Association & Austin Retired Teachers Association

Mr. Barth called the meeting to order at 8:07 a.m. All committee members were present.

**1. Consider the approval of the proposed minutes of the March 27, 2014 committee meeting – Todd Barth.**

On a motion by Ms. Sissney, seconded by Mr. Corpus, the committee approved the minutes of the March 27, 2014 meeting as presented.

**2. Receive an update and review of Private Equity and Real Assets – Eric Lang, Neil Randall, and Grant Walker.**

Mr. Lang provided an overview of the Private Equity Portfolio, including its performance, size,

expected market returns, and team structure. Mr. Lang stated for Mr. Barth that public risk proxy measures the daily volatility of the Private Equity Portfolio when compared to volatility in a public markets portfolio. Mr. Randall stated for Mr. Kelly that the rate of alpha increase relative to invested dollars had narrowed over the past three or four years.

Mr. Randall stated that actual portfolio allocations met targeted allocations in all areas, other than U.S. domestic buyout and international emerging markets. Mr. Kelly requested that the team provide a deeper dive on the growth equity and venture capital sectors. Mr. Randall stated that this was a sizable capital commitment year because of large distributions received last year and projected for this year. He confirmed for Dr. Brown that the performance of the premier list managers placed them on average between the first and second quartile of peer group managers. Mr. Kelly requested that the team present co-investment returns separately in future presentations.

Mr. Randall highlighted the performance accomplishments of 2013 and priorities set for 2014. He stated that capital raised for 2014 was projected to be above the level reached in 2013. In response to a question from Mr. Kelly about the strategy for investing capital in private equity at this time, Mr. Randall stated that a cautious approach was appropriate, but that the continuing commitment of capital was important.

Mr. Lang provided an overview of the Real Assets Portfolio, including its performance, size, expected market returns, and team structure. Mr. Walker stated that actual allocations met targeted allocations in all areas, except RASS (Real Assets Special Situations) and infrastructure which were underweight. Value-Add and Opportunistic real estate were currently overweight their targeted allocation. Mr. Walker stated that this would be the first year that the portfolio was self-funded with distributions exceeding capital calls.

Mr. Walker stated that performance over the course of 2013 was well above average and that priorities for 2014 included focusing on the portfolio's principal investments program, using technology to develop better pricing skills, increasing productivity, and decreasing expenses. Mr. Walker stated that capital flows in the market were well below the peak period, but close to the ten-year average. He also addressed current market pricing metrics, debt positions, and interest rates. Mr. Walker stated that property types were in a growth phase as supply and demand fundamentals continued to remain reasonable.

### **3. Receive an update on Energy and Natural Resources – Vaughn Brock.**

Mr. Brock stated that the Energy and Natural Resources Portfolio had made five investments since October 2013, that target return for the portfolio was 16%, and that the net asset value of the portfolio was targeted to be 3% of the trust. He described allocation zones and expected market returns. He stated for Mr. Barth that portfolio build-out would occur within three years and that performance results should be seen by then. In response to questions from Mr. Colonna regarding portfolio allocations to MLPs, Mr. Brock stated that the portfolio was involved in some private MLPs and that future investment in the public MLP arena was being considered. Responding to questions from Mr. Kelly regarding research on investing in MLPs, Mr. Brock stated that he would be glad to supply the board with that information and would be open to receiving feedback on it.



Mr. Brock highlighted the performance accomplishments of 2013 and the priorities that were set for 2014. In response to questions from Mr. Barth, Mr. Colonna, and Ms. Sissney regarding priorities for 2014, Mr. Brock stated that \$1 billion would be deployed in portfolio commitments by the end of calendar year 2014. Mr. Brock stated that even though capital flows in the energy space were strong, they were short of what was needed for current oil drilling activities. He also stated, though, that an existing capital bottleneck had resulted in increased competition and higher prices. Mr. Brock also discussed physical bottlenecks with regard to drilling infrastructure and light sweet crude refining operations.

**4. Receive an update on the Private Markets Strategic Partnership Network – David Veal and Courtney Villalta.**

Mr. Veal stated that the Strategic Partner Network (SPN) operated at a long-term double digit target net return within a diversified platform that included favorable economic terms and other mutually beneficial and attractive features. He also stated that four investment commitments had been made since December 31, 2013 such that \$4.6 billion of the \$6 billion initial allocation had been committed, and that the remaining amount was expected to be fully committed by the end of 2015. Mr. Veal stated that the pace of primary commitments had started to slow, while the pace of the actual investment had started to increase. He also stated that the bulk of the allocations from this point forward would be focused within the opportunistic category and that fee savings from employing in the SPN structure would continue. Ms. Villalta stated that Phase 2 of the strategy would use market value, unfunded commitments, and recycled dollars as key inputs for calculating the “available line of credit” (ALOC) in making future investments.

**5. Discuss the Private Market Investment Outlook – George Roberts, KKR.**

Mr. Roberts provided a presentation on the private market investment outlook and commented on the importance of business operations, having the right people in the right places, and being knowledgeable about current macro trends.

The meeting adjourned at 10:27 a.m.





## Public Markets Strategic Partnership Network (SPN)

David T. Veal, Director  
Grant Birdwell, Investment Manager  
September 2014

# Agenda

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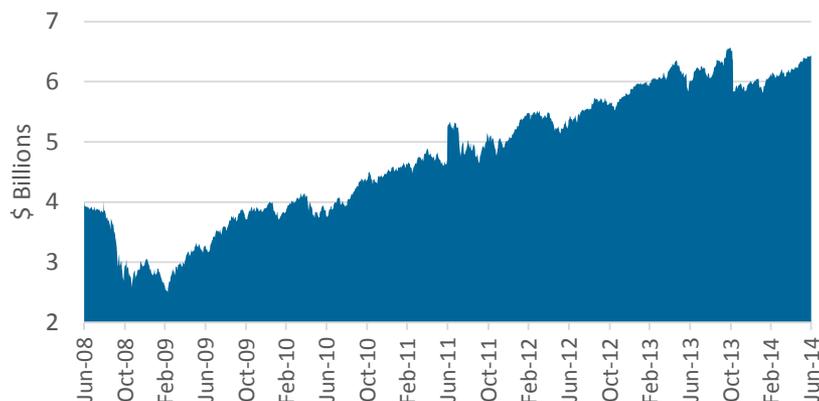
- I. Overview
- II. History
- III. Performance
- IV. Positions
- V. Research
- VI. Priorities

# Public Markets SPN Performance

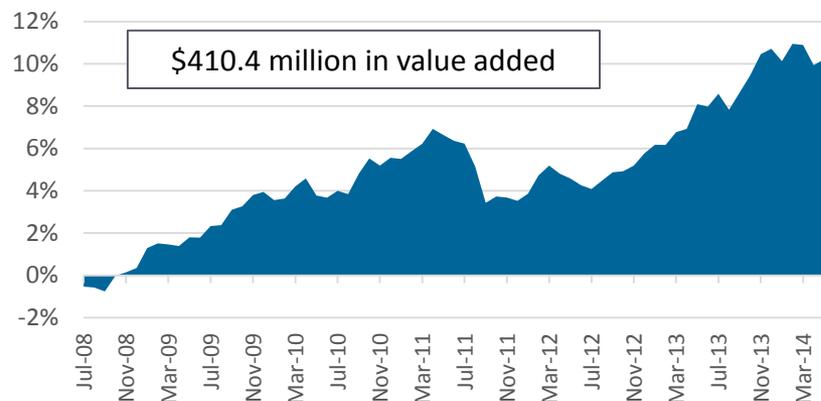
As of June 30, 2014

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	1,558.2	1.2%	18.2	9.6	7.4	0.7	-0.3	0.7	2.4	1.9	2.1	0.3	-0.1	0.3
JP Morgan	1,662.6	1.3%	17.8	10.5	8.4	0.3	0.6	1.7	1.9	2.7	2.4	0.2	0.2	0.7
Morgan Stanley	1,601.8	1.2%	18.2	11.9	7.9	0.7	2.0	1.2	1.9	1.9	1.6	0.4	1.0	0.7
Neuberger Berman	1,612.5	1.2%	18.1	9.4	7.8	0.6	-0.5	1.2	1.2	1.9	2.1	0.5	-0.3	0.5
<b>Total Public SPN</b>	<b>6,435.2</b>	<b>4.9%</b>	<b>18.2</b>	<b>10.3</b>	<b>7.9</b>	<b>0.7</b>	<b>0.4</b>	<b>1.2</b>	<b>1.4</b>	<b>1.5</b>	<b>1.4</b>	<b>0.5</b>	<b>0.3</b>	<b>0.9</b>

Public Markets SPN Assets Under Management



Cumulative Alpha of Public Markets SPN



Note: Barclays inception was July 1, 2011 and termination was October 31, 2013. All others began on July 1, 2008 and have continued to the present day.  
Source: State Street Bank



# Mandates

## Public Investments

- Manage, oversee and monitor four **unique long-term investment relationships in the public markets** around the world

## Private Investments

- Work closely with two industry-leading private markets specialist partners to **identify and allocate capital to attractive private opportunities**

## Headlight System

- Use and disseminate views and positioning data from partners to **provide insight and support to other groups** in the IMD and to the Trust overall

## Research Center

- Work with heavily resourced partners to provide **customized, timely investment research and training** that meets the needs of the IMD

## Center of Excellence

- Leverage the TRS investment network to **develop product and process expertise** to help ensure that the IMD is world-class in every respect

# Strategic Partnerships & Research Group



**David T. Veal, CAIA, CFA, FRM**  
**Director, Strategic Partnerships & Research**  
BS, Industrial Engineering, Auburn University  
MBA, Finance & Accounting, University of Michigan  
*Background:*

- *Portfolio Manager, ERS of Texas*
- *Research Analyst, Morgan Stanley*
- *Supply Officer, US Navy*



**Grant Birdwell**  
**Investment Manager**  
BS, Finance, Texas A&M  
*Public Markets*  
*Background:*

- *TRS Tactical Asset Allocation*
- *Fixed Income Trading, Morgan Stanley*
- *Institutional Advisory, Morgan Stanley*



**Courtney Villalta**  
**Senior Investment Manager**  
BS, Finance, St. Edwards  
*Private Equity and Real Assets*  
*Background:*

- *TRS External Private Markets*
- *Private Equity*
- *Investment Banking, Tejas Securities Co.*



**Patricia Cantu**  
**Director**  
**Research and Analytics**  
*Background:*

- *TRS Real Estate*
- *TRS Chief Investment Officer's assistant*
- *IMD Operations- Business Center Director*



**Matt Wey**  
**Analyst**  
BBA, Accounting, Texas A&M  
MS, Finance & Mathematics, Texas A&M  
*Background:*

- *Associate, Berkeley Research Group*



**Susan White**  
**Analytics and Support**  
BS, French, The Pennsylvania State University  
*Background:*

- *TRS Executive Scheduler to the Chief Investment Officer*

# History of the Public Markets SPN

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- First major initiative using external managers in public markets
- Firms manage customized and risk-controlled global mandates
- Benchmark weights and tactical ranges based on TRS public markets asset allocation policy
- Four partners selected (BlackRock, JP Morgan, Morgan Stanley, Neuberger Berman) after a thorough review of multiple candidates
- Funded at \$1 billion each in July 2008

# Seven Requirements for Public Markets Strategic Partners

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1. Delivers **full range** of valuable investment products and services
2. **Customizes** products and services to specific TRS requirements
3. Operates **globally** with a sustainable business model
4. Produces proprietary, value-added investment **research**
5. Shares significant **resources** when appropriate
6. Shares long-term **compensation philosophy** compatible with TRS
7. Fully committed team, beginning with **senior management**

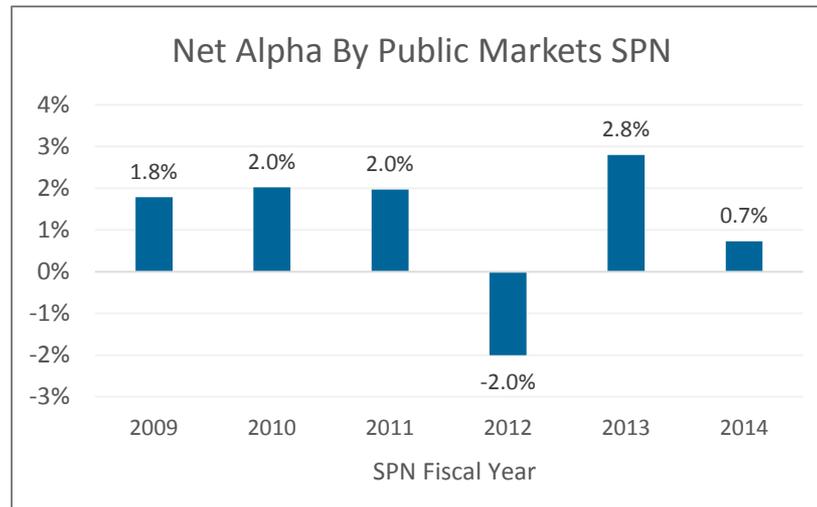
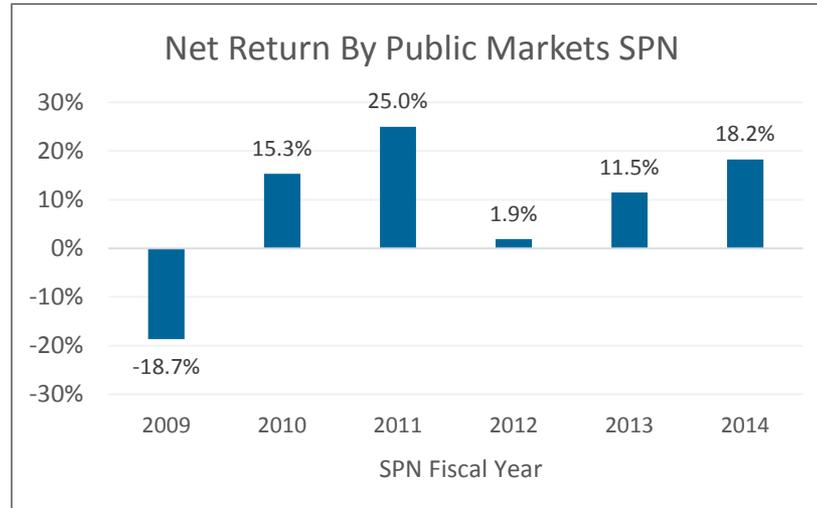
# 2013 Priorities Update

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- Enhancement of Trust “headlight system” using portfolio signals
- Develop common language to enable greater information exchange
- Greater IMD access to Strategic Partner resources and research
- Develop academic research partnership with State Street Associates

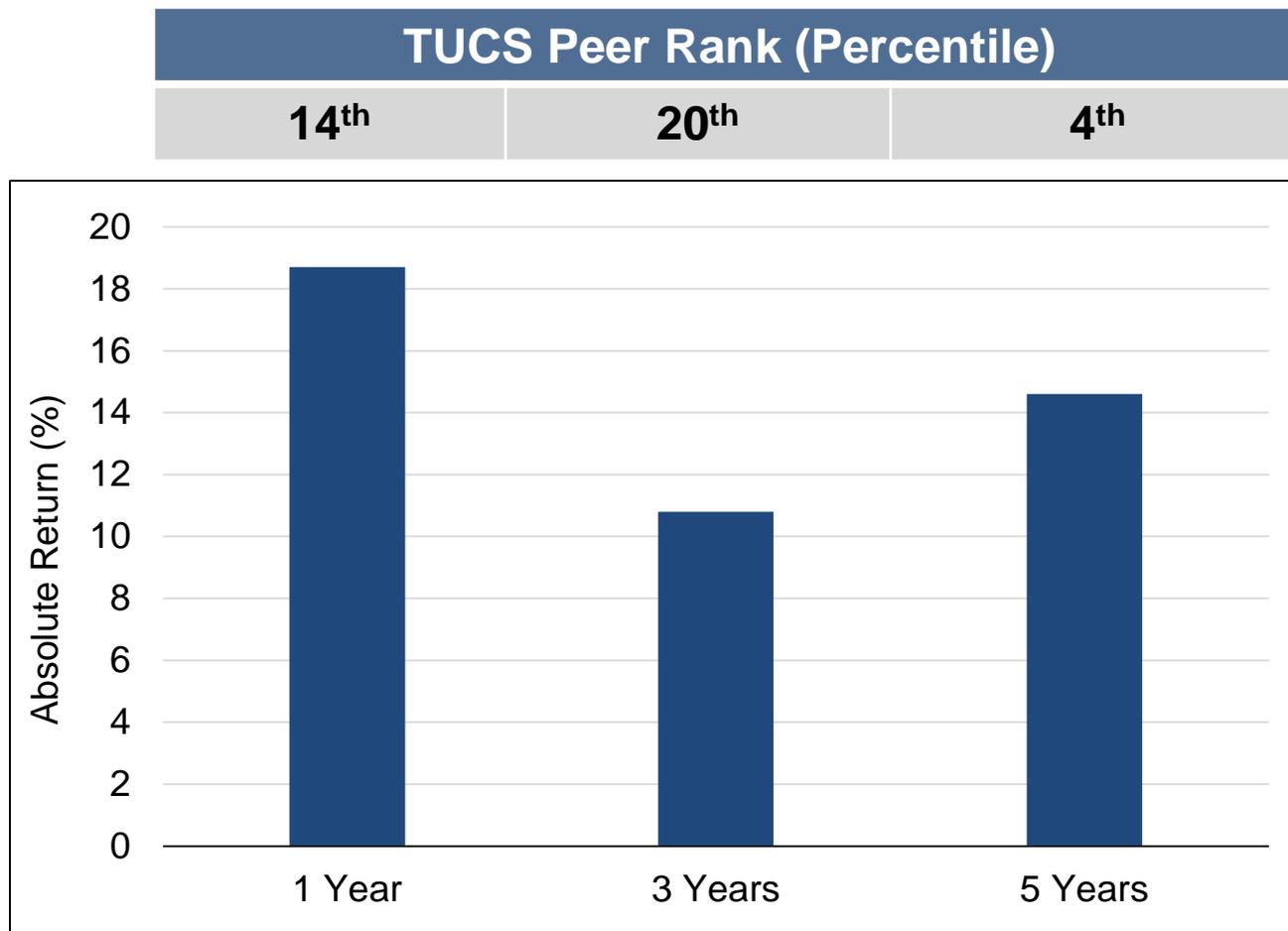
# Public Markets SPN Performance

*Periods Ending June 30*



# Public Markets SPN Performance

*Periods Ending June 30*



# Public Markets SPN Positioning

## “Headlight System” Example

As of 12/31/2013

Benchmark	Global Equity					Stable Value				Real Return			
	Total	US		Non-US		Total	US Long	Non \$	Credit	Total	Inflation		
		LC	SC	EAFE	EM		Treasury	Sov Debt			Linked	Com	REITs
Neutral	68%	28%	6%	20%	14%	20%	20%	0%	0%	12%	7%	3%	2%
BlackRock	15.4%	8.3%	-2.5%	10.0%	-0.4%	8.3%	2.4%	0.0%	5.9%	-4.4%	-1.5%	-0.9%	-2.0%
JP Morgan	11.9%	4.6%	4.6%	3.1%	-0.5%	1.5%	-7.8%	0.0%	9.4%	-4.8%	-3.1%	-0.7%	-1.0%
Morgan Stanley	1.3%	1.8%	0.1%	3.6%	-4.2%	-1.5%	2.6%	-4.1%	0.0%	-4.3%	-2.7%	-1.5%	-0.1%
Neuberger Berman	5.9%	2.5%	0.1%	1.2%	2.1%	1.3%	-8.0%	3.6%	5.7%	-0.8%	0.1%	-0.7%	-0.2%
<b>Total (Average)</b>	<b>8.6%</b>	4.3%	0.6%	4.5%	-0.7%	<b>2.4%</b>	-2.7%	-0.1%	5.3%	<b>-3.6%</b>	-1.8%	-1.0%	-0.8%

As of 06/30/2014

Benchmark	Global Equity					Stable Value				Real Return			
	Total	US		Non-US		Total	US Long	Non \$	Credit	Total	Inflation		
		LC	SC	EAFE	EM		Treasury	Sov Debt			Linked	Com	REITs
Neutral	68%	28%	6%	20%	14%	20%	20%	0%	0%	12%	7%	3%	2%
BlackRock	3.0%	4.0%	-4.0%	1.0%	2.0%	-7.6%	-13.0%	0.0%	5.4%	-4.5%	-1.5%	-1.0%	-2.0%
JP Morgan	5.0%	4.1%	0.9%	-0.1%	0.0%	7.6%	-6.0%	6.0%	7.6%	-3.9%	-3.2%	-0.7%	0.0%
Morgan Stanley	-1.4%	1.4%	-0.2%	5.2%	-7.8%	-5.5%	-7.0%	1.5%	0.0%	-7.0%	-2.8%	-4.2%	0.0%
Neuberger Berman	7.9%	1.9%	0.1%	1.6%	4.4%	1.5%	-8.4%	5.3%	4.6%	-0.4%	-0.7%	0.3%	0.0%
<b>Total (Average)</b>	<b>3.6%</b>	2.8%	-0.8%	1.9%	-0.3%	<b>-1.0%</b>	-8.6%	3.2%	4.4%	<b>-3.9%</b>	-2.0%	-1.4%	-0.5%

# Joint Public/Private SPN Summit

## *Center of Excellence*

- Held on July 22-23, 2014 in New York City
- Second annual event and the most successful event of its kind
- Brought together 55 senior professionals representing 7 firms
- ~1000 years of collective leadership and investment experience

KEY TOPICS OF DISCUSSION	
SPN positioning and performance	Fed policy outlook
Business cycle dynamics	Geopolitical risk
Global monetary policy	US political landscape
Employment and inflation	Elements of leadership

# Joint Public/Private SPN Summit Key Findings

## *Center of Excellence*

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- US still the natural starting point from which to calibrate a global business cycle analysis
- US unemployment rate is decreasing more rapidly than anticipated
- US is mid-cycle in terms of business cycle but late cycle in terms of valuations
- Absent an external shock, risk to US growth estimates tilted slightly higher than consensus for the balance of 2014
- Credit cycle likely to end before the equity cycle but both may be elongated relative to history given the suite of levers the Fed has pulled
- Foreign central banks, particularly the European Central Bank, face a difficult task given the diverse set of circumstances they must navigate
- Markets have shrugged off recent geopolitical news as critical elements of the global economy have not been involved
- Recent placidity could change quickly and must be closely monitored

# Public Strategic Partnership

## Research Center

### PUBLIC STRATEGIC PARTNERSHIP RESEARCH PROJECTS

Program	2008	2009 1H	2009 2H	2010 1H	2010 2H	2011 1H	2011 2H	2012 1H	2012 2H	2013 1H	2013 2H	2014 1H
Barclays				Risk Budgeting		Alternative Risk Premia	Risk Based Asset Allocation	Hedge Fund Alpha Persistence	Hedge Fund Risk Premia	Risk Premia Implementation		
BlackRock	Currency Hedging	Inflation and Deflation	Portfolio Risk Analysis	NCREIF Modeling	NOI/Private Equity Model	Optimal Property Sector	Real Estate as Inflation Hedge	Thematic Trading	Forecasting Volatility	Global Opportunistic Screens	Role of Hedge Funds in SAA	Sentiment Based Signals
JP Morgan	Currency Hedging	Downside Risk	Inflation and GDP Regimes	Regimes and Asset Classes		Regime Change	Tail Risk	Factor Rotation	Europe Country Switching	Switching between Risk Parity and Mean Variance	Inflation Shocks/Hedging	Multi-factor Inflation Model with Asset Class Responses
Morgan Stanley	Currency Hedging	Inflation Regimes	Liquidity	Sentiment	Volatility Reduction	Earnings Forecasting		Gold vs. Cash Switching	European Country Switching Model	Tactical FX Overlay	U.S. Treasury Fair Value Model	EM Risk Premium Model
Neuberger Berman	Currency Hedging	Regime Analysis	Tactical Credit Allocation	Risk Based Asset Allocation		Risk Parity		Spanning Tree Analysis	Implications of Low Rates	Structured Alpha: Part I	Structured Alpha: Part 2	Multi-factor Cycle Model

#### INVESTMENT MODELS

- NCREIF Modeling
- NOI/Private Equity
- Optimal Property Sector
- Factor Rotation
- European Country Switching
- Tactical FX Overlay
- Tactical Credit Allocation

#### VALUATION FRAMEWORKS

- Inflation/Deflation Regimes
- Regimes and Asset Classes
- Regime Change
- Sentiment
- Earnings Forecasts
- Implications of Low Rates
- Opportunistic Global Screens
- Persistence of Hedge Fund Alpha
- Treasury Fair Value Model
- EM Risk Premium

#### RISK MANAGEMENT

- Risk Budgeting
- FX Hedging
- Portfolio Risk Analysis
- RE as an Inflation Hedge
- Forecasting Volatility
- Tail Risk
- Liquidity Risk
- Volatility Reduction
- Spanning Tree Analysis
- Inflation Hedging

#### INVESTMENT STRATEGIES

- Alternative Risk Premia
- Risk-Based Asset Allocation
- Hedge Fund Risk Premia
- Risk Premia Implementation
- Thematic Investing
- Switching Between Risk Parity and Mean Variance
- Structured Alpha

# 2014 Priorities

## *Research Projects, Summits, Information Delivery and Announcements*

- Increase visibility and awareness of Public Markets SPN positioning and trends among key constituents
- Develop standalone capital plan and semiannual portfolio review process for Private Markets SPN
- Expand skill set of each team member and build strong, collegial culture
- Streamline critical processes including more efficient use of email

### SPN Summits remaining during 2014

- Public Markets SPN Summit – Wednesday, September 24 in Austin
- Private Markets SPN Summit – Wednesday, November 5 in Austin

# APPENDIX

# STAR Report for Total Public Markets SPN

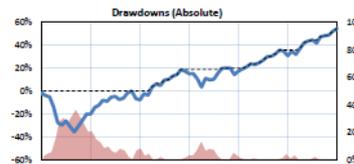


## Total SPN vs. SPN Benchmark Statistical Tracking And Reporting (STAR) Report

Monthly Data from 6/08 to 6/14



Avg. Monthly Excess Return: 0.14%



Largest Drawdown: 35.93%, Peak to Trough

Period	Portfolio	Benchmark	VER	T.E.	I.B.
3-month	4.26%	4.98%	(0.72%)		
YTD	6.91%	7.71%	(0.81%)		
1-year	18.25%	17.51%	0.74%	1.37%	0.54
2-year	14.80%	13.01%	1.79%	1.20%	1.49
3-year	10.33%	9.09%	0.44%	1.46%	0.30
5-year	14.12%	13.06%	1.03%	1.34%	0.77
10-year	N/A	N/A	N/A	N/A	N/A
Inception	7.39%	5.64%	1.76%	1.87%	0.94

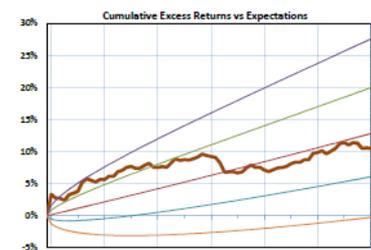
Performance by Year:	Year	Portfolio	Benchmark	Excess
Start Date:	2008	(26.34%)	(29.04%)	2.70%
6/30/08	2009	29.23%	24.56%	4.66%
	2010	15.04%	13.93%	1.11%
End Date:	2011	0.46%	2.41%	(1.94%)
6/30/14	2012	15.03%	13.49%	1.53%
	2013	14.08%	10.74%	3.34%
	2014	6.91%	7.71%	(0.81%)

Valuation Model: Overvalued Half-Signal since: 05/31/2013  
Overall Performance (Since Inception 6/30/08)

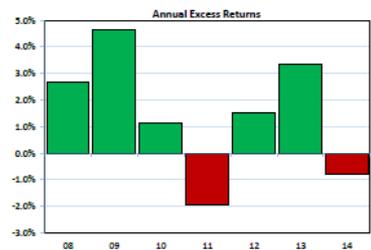
Cumulative Performance:				
Portfolio	54.3%	Periods	73	
Benchmark	39.6%	R-Squared	98.3%	
Excess Return	14.7%	Tracking Error	1.9%	

Annualized Performance:					
Return	7.39%	Benchmark	5.64%	Diff	1.76%
St. Dev.	14.47%		14.39%		0.08%
Best Month	7.77%		7.90%		(0.13%)
Worst Month	(15.97%)		(16.67%)		0.70%
Slew	(0.99)		(1.11)		2.25
Kurtosis	2.70		3.33		13.18
Best 12 Mths	46.05%		43.80%		
Worst 12 Mths	(20.22%)		(24.46%)		
Up Capture	43.00%		40.24%		
Down Capture	(34.06%)		(34.81%)		

Risk Summary:					
Info. Ratio	0.94	Sharpe	0.50	Hit Rt Up	70%
M2 Premium	7.35%	Treynor	0.07	Hit Rt Dn	41%
Beta	1.00	Sortino	0.43	Hit Rt Tot	59%
Jensen's alpha	1.77%	5% hVar	(0.53%)		

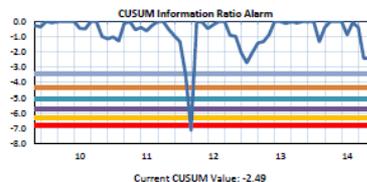


Ann. Expected Ex. Ret: 2.0%, Ann. Expected T.E.: 2.5%

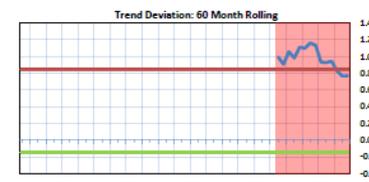
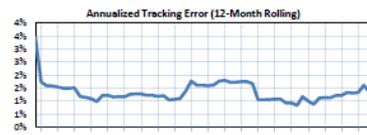


## Total SPN vs. SPN Benchmark Statistical Tracking And Reporting (STAR) Report

Monthly Data from 6/08 to 6/14



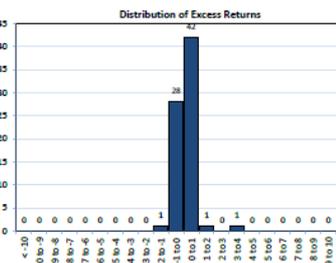
Current CUSUM Value: -2.49



Overvalued Signal Pending Current 60 Month IR: 0.77



No Active Signal



Hit Rate Analysis:		
Periods	Hit Rate	Avg Ex Ret
Benchmark Up	46	69.6%
Benchmark Down	27	40.7%
All Periods	73	58.9%

Hit Rate During Various Environments:			
Value/ Growth	Value	Neutral	Growth
	Outperf.		Outperf.
Periods	20	37	16
Hit Rate	35.0%	67.6%	68.8%
Avg Ex Ret	(0.12%)	0.19%	0.35%
EM/ US Stocks	EM	Neutral	US
	Outperf.		Outperf.
Periods	15	46	12
Hit Rate	46.7%	58.7%	75.0%
Avg Ex Ret	0.03%	0.06%	0.59%
Equity Size	Large	Neutral	Small
	Outperf.		Outperf.
Periods	14	34	25
Hit Rate	42.9%	61.8%	64.0%
Avg Ex Ret	0.10%	0.08%	0.23%
Treasuries/ High Yield	Treas.	Neutral	High Yield
	Outperf.		Outperf.
Periods	25	17	31
Hit Rate	28.0%	58.8%	83.9%
Avg Ex Ret	(0.04%)	0.08%	0.32%

Treasuries/ GSCI			
	Treas.	Neutral	GSCI
	Outperf.		Outperf.
Periods	30	10	33
Hit Rate	33.3%	70.0%	78.8%
Avg Ex Ret	(0.09%)	0.30%	0.29%
Stocks/ Bonds	Stocks	Neutral	Bonds
	Outperf.		Outperf.
Periods	39	10	24
Hit Rate	79.5%	30.0%	37.5%
Avg Ex Ret	0.25%	(0.06%)	0.05%
US/ Intl Stocks	US	Neutral	Intl.
	Outperf.		Outperf.
Periods	27	25	21
Hit Rate	44.4%	64.0%	71.4%
Avg Ex Ret	(0.01%)	0.27%	0.17%







## External Public Markets

Dale West, Senior Managing Director

Susanne Gealy, Director

Brad Gilbert, Director

September 2014

# Agenda

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- I. Performance and Investment Summary
- II. Update on 2013 Priorities
- III. External Public Markets Team and Processes
- IV. Long-Oriented Update
- V. Hedge Fund Update and Customized Fund Investment Case Study
- VI. 2014 Priorities

# Executive Summary

## As of June 30, 2014

EXTERNAL PUBLIC MARKETS							
Total Assets (\$ Millions)	Percent of Trust	1-Year Return	3-Year Return	5-Year Return	1-Year Alpha	3-Year Alpha	5-Year Alpha
\$42,213	32.4% <sup>1</sup>	18.4%	9.0%	13.2%	0.6%	0.7%	1.9%

PERFORMANCE									
Program	1-Year Return	3-Year Return	5-Year Return	1-Year Alpha	3-Year Alpha	5-Year Alpha	1-Year TUCS Peer Quartile	3-Year TUCS Peer Quartile	5-Year TUCS Peer Quartile
US Large Cap	24.8%	16.0%	19.1%	-0.2%	-0.6%	0.2%	2 <sup>nd</sup>	3 <sup>rd</sup>	2 <sup>nd</sup>
US Small Cap	22.6%	15.1%	n/a	-3.8%	-0.9%	n/a	4 <sup>th</sup>	3 <sup>rd</sup>	
Non-US Developed	23.1%	7.9%	11.5%	-0.7%	0.4%	-0.2%	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>
Emerging Markets	14.3%	0.8%	10.3%	0.0%	1.2%	1.1%	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>
World Equity	23.9%	12.4%	n/a	1.0%	2.1%	n/a	2 <sup>nd</sup>	2 <sup>nd</sup>	
Total Hedge Funds	9.4%	5.6%	6.1%	2.2%	0.4%	2.1%			
Stable Value Hedge Funds	5.1%	3.7% <sup>2</sup>	n/a	-1.5%	-1.6% <sup>2</sup>	n/a			
Directional Hedge Funds	13.2%	10.2% <sup>2</sup>	n/a	5.5%	4.6% <sup>2</sup>	n/a			
Other Absolute Return	36.5%	35.3%	30.0%	34.2%	33.0%	27.6%			

ASSETS				
Program	June 2013 Assets	June 2014 Assets	June 2014 % of Trust	Long-Term Target % of Trust
	(\$ Millions)			
<b>External Managers</b>	<b>\$26,443</b>	<b>\$30,283</b>	<b>23.3%</b>	<b>22.5%</b>
US Large Cap (9 portfolios)	7,965	8,144	6.3%	6.2%
US Small Cap (6 portfolios)	2,127	2,017	1.5%	1.6%
Non-US Developed (8 portfolios)	5,761	5,896	4.5%	4.6%
Emerging Markets (9 portfolios)	6,250	8,571	6.6%	6.1%
World Equity (5 portfolios)	4,340	5,655	4.3%	4.0%
<b>Hedge Funds</b>	<b>\$9,434</b>	<b>\$11,634</b>	<b>8.9%</b>	<b>9.0%</b>
Stable Value (18 portfolios)	4,293	5,193	4.0%	4.0%
Directional (23 portfolios)	5,141	6,442	4.9%	5.0%
<b>Other Absolute Return (2 portfolios)</b>	<b>\$129</b>	<b>\$296</b>	<b>0.2%</b>	<b>0.0%</b>

<sup>1</sup>32.4% includes fund-based investments, including hedge funds. Agency agreements remain below 30% legislative mandate.

<sup>2</sup>Annualized Performance from October 2011 to June 2014 (33 Months)

Source: State Street Bank - Performance is annualized and net of fees



# Investment Highlights

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- Alpha achieved overall on a 1, 3, and 5-year basis
  - Strong positive returns over past 5 years
  - Four of eight portfolios generated positive 1-year alpha
  - US equity portfolios lagged strong markets
  - \$264 million in added value over 12 months compared to benchmarks
- Strong hedge fund performance since October 2011 split
  - Strong absolute and relative performance of Directional Hedge Funds
  - Stable Value Hedge Funds portfolio fulfilling its diversification role
- Portfolio build-out substantially complete

# Update on 2013 Top Priorities

2013 Goals	Actual	Explanation																																		
<p>Generating alpha across all portfolios</p>	<ul style="list-style-type: none"> <li>1-year and 3-year alpha generated by Total External Public Markets program</li> <li>1-year alpha achieved in 4 of 8 portfolios</li> <li>3-year alpha achieved in Non-US developed, Emerging Markets, World Equity, Hedge Funds and Other Absolute Return</li> <li>3-year alpha not achieved in US Large Cap and US Small Cap</li> </ul>	<p><i>As of June 30, 2014</i></p> <table border="1"> <thead> <tr> <th></th> <th>1-Year Alpha</th> <th>3-Year Alpha</th> </tr> </thead> <tbody> <tr> <td>US Large Cap</td> <td>-0.2%</td> <td>-0.6%</td> </tr> <tr> <td>US Small Cap</td> <td>-3.8%</td> <td>-0.9%</td> </tr> <tr> <td>Non-US Developed</td> <td>-0.7%</td> <td>0.4%</td> </tr> <tr> <td>Emerging Markets</td> <td>0.0%</td> <td>1.2%</td> </tr> <tr> <td>World Equity</td> <td>1.0%</td> <td>2.1%</td> </tr> <tr> <td>Total Hedge Funds</td> <td>2.2%</td> <td>0.4%</td> </tr> <tr> <td>    Directional Hedge Funds</td> <td>5.5%</td> <td>4.6%<sup>1</sup></td> </tr> <tr> <td>    Stable Value Hedge Funds</td> <td>-1.5%</td> <td>-1.6%<sup>1</sup></td> </tr> <tr> <td>Other Absolute Return</td> <td>34.2%</td> <td>33.0%</td> </tr> <tr> <td>Total External Public Markets</td> <td>0.6%</td> <td>0.7%</td> </tr> </tbody> </table>		1-Year Alpha	3-Year Alpha	US Large Cap	-0.2%	-0.6%	US Small Cap	-3.8%	-0.9%	Non-US Developed	-0.7%	0.4%	Emerging Markets	0.0%	1.2%	World Equity	1.0%	2.1%	Total Hedge Funds	2.2%	0.4%	Directional Hedge Funds	5.5%	4.6% <sup>1</sup>	Stable Value Hedge Funds	-1.5%	-1.6% <sup>1</sup>	Other Absolute Return	34.2%	33.0%	Total External Public Markets	0.6%	0.7%	
	1-Year Alpha	3-Year Alpha																																		
US Large Cap	-0.2%	-0.6%																																		
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Other Absolute Return	34.2%	33.0%																																		
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<p>Continue to develop the External Public team</p>	<ul style="list-style-type: none"> <li>Stable team of 17 professionals growing their industry and investment knowledge</li> </ul>	<ul style="list-style-type: none"> <li>First educational exchange for two team members at Rock Creek Group</li> <li>4 CFA, 3 CAIA, and 4 CPA exams passed during the year</li> <li>Brad Gilbert named to <i>CIO Magazine's</i> "40 under 40" and <i>Institutional Investor's</i> "Rising Stars of Hedge Funds"</li> <li>863 hours of TRSU training completed by External Public team so far in FY 2014</li> </ul>																																		
<p>Moving from manager selection to strategic collaboration</p>	<ul style="list-style-type: none"> <li>Several customized investment strategies negotiated over the past twelve months</li> </ul>	<ul style="list-style-type: none"> <li>Concentrated best ideas fund from multi-strategy hedge fund (\$274M)</li> <li>Contingent commitment to market opportunity fund at reduced fees (\$150M committed)</li> <li>Customized quantitative value strategy in long-oriented global equity (\$119M)</li> <li>Customized multi-PM structure for long-oriented global equity (\$2B)</li> </ul>																																		
<p>Continuing integration and cooperation with other IMD teams</p>	<ul style="list-style-type: none"> <li>Cooperation on ad-hoc and project basis across the IMD</li> <li>Active team member roles in the Internal Investment Committee and mid-career Ambassadors groups</li> </ul>	<ul style="list-style-type: none"> <li>Cooperation with Asset Allocation group's creation of two opportunistic investment vehicles with External Public managers</li> <li>Cooperation with Risk and Asset Allocation groups on risk parity, reinsurance and style premium strategies</li> <li>Cooperation with Emerging Manager team on public equity strategies (\$330M)</li> </ul>																																		



<sup>1</sup>Annualized return from October 2011 to June 2014 (33 months total)  
Source: State Street Bank  
Note: Performance is annualized and net of fees

# External Public Markets Team



**Dale West, CFA**  
Sr. Managing Director  
MBA, Stanford

## INVESTMENTS TEAM



**Susanne Gealy, CAIA**  
Director, Global Equity  
MBA, University of Chicago



**Brad Gilbert, CFA, CAIA**  
Director, Hedge Funds  
BBA, UT Austin



**Katy Hoffman**  
Director  
MBA, Vanderbilt



**Joel Hinkhouse, CFA**  
Sr. Investment Manager  
MBA, University of Chicago



**Lulu Llano, CFA**  
Sr. Associate  
BBA, UT Austin



**Komson Silapachai, CFA**  
Sr. Associate  
BBA, Texas A&M



**Steven Wilson, CAIA**  
Associate  
MBA, Rice University



**Mikhael Rawls**  
Sr. Analyst  
AB, Harvard



**Scott Gonsoulin**  
Sr. Analyst  
MS, Texas A&M



**Rachel Clark, CAIA**  
Sr. Analyst  
BA, UT Austin



**Ben Wechter**  
Sr. Analyst  
MS, UT Austin



**Nick Croix**  
Analyst  
MS, UT Austin

## ANALYTICS



**Joe Tannehill, CFA**  
Sr. Investment Manager  
MBA, UNC Chapel Hill



**Patty Steinwedell**  
Analyst  
BA, North Carolina State



**Courtney Dunn**  
Analyst  
BBA, UT San Antonio

## RELATIONSHIP MANAGEMENT



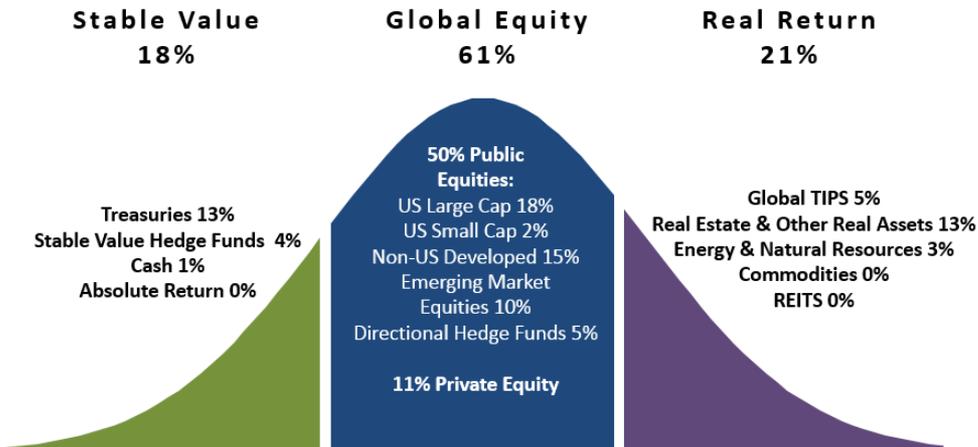
**Jon Klekman**  
Analyst  
BA, SUNY Binghamton

**ADVISORS:** Albourne, Hewitt EnnisKnupp, Investcorp, The Rock Creek Group

# External Public Markets Portfolio Role

- Legislative cap for Agency Agreements: 30%
  - Does not include fund-based investments such as hedge funds
- Legislative cap for Hedge Funds: 10%
- Target tracking error for external Global Equity portfolios: 3-5%
  - Internal Global Best Ideas (GBI): 0-2%

Program	Long-Term Target	Percent of Trust	
		6/30/2014	6/30/2013
<b>External Managers</b>	<b>22.5%</b>	<b>23.3%</b>	<b>22.8%</b>
US Large Cap	6.2%	6.3%	6.9%
US Small Cap	1.6%	1.5%	1.8%
Non-US Developed	4.6%	4.5%	5.0%
Emerging Markets	6.1%	6.6%	5.4%
World Equity	4.0%	4.3%	3.7%
<b>Hedge Funds</b>	<b>9.0%</b>	<b>8.9%</b>	<b>8.1%</b>
Stable Value	4.0%	4.0%	3.7%
Directional	5.0%	4.9%	4.4%
<b>Other Absolute Return</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.1%</b>
<b>Total</b>	<b>31.5%</b>	<b>32.4%</b>	<b>31.1%</b>

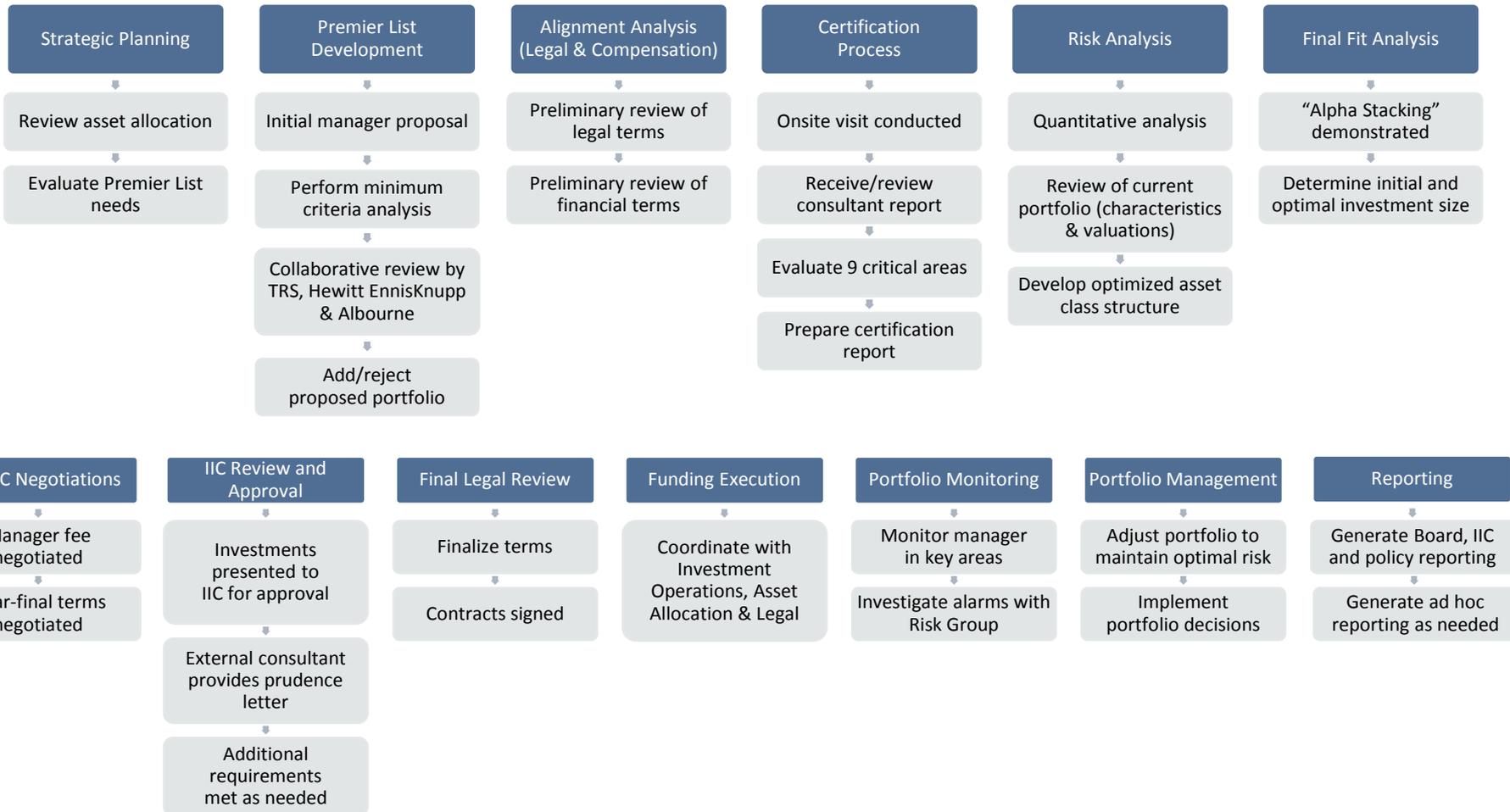


Source: State Street Bank



# External Public Critical Processes

## Texas Way



# Investment Process

## Texas Way

Organization	Investment Process	Performance	Portfolio Exposure
History	Benchmark	Beta	Country
Investment Philosophy	Objective	Correlation	Market Capitalization
Culture	Style	CUSUM	Policy Violations
Competitive Advantage	Region	Environmental Analysis	Fund Positions
Key Personnel	Instruments	Fund Track Record	
Professional Team	Idea Generation	Hit Ratio	
Ownership	Portfolio Construction	Information Ratio	
Compensation Philosophy	Strategy Implementation and Research	Maximum Drawdown	
Conflicts of Interest	Portfolio Concentration	Performance	
Employee Turnover	Portfolio Monitoring	Portfolio Volatility	
Succession Plan	Hedging	Up/Down Capture	
Firm Infrastructure		Sharpe Ratio	
Long-term Solvency			
Firm Assets			
Target Assets			
Subscription Capacity			
Client Base			
Placement Agent			

Risk Management	Diversification Impact	Fund Terms	Operation Check	Transparency
Market Risk Factors	Versus Peers	Fees	Pricing	Transparency Level
Leverage	Versus Asset Class	Hurdle Rate	Settlement Process	Transparency Frequency
Drawdown History	Versus Internal	Lock Up Period	Back Office	
Liquidity	Versus Fund	Early Redemption Penalty	Prime Brokers	
Risk Management Systems		High Water Mark	Administrator	
Audit History		Redemption Gate	Counterparty Exposure	
		Redemption Notice	Legal Resources	
		Redemption Period	Consultant Report	
		Subscription Period	Reference Check	
		Hedge Fund Test	Background Check	

# Update on Long-Oriented Global Equity Portfolio

## Long-Oriented Global Equity Portfolios

As of 06/30/2014

	Assets (\$ Millions)	Return (1-Year)	Alpha (1-Year)
<b>US Large Cap</b>	<b>\$8,144</b>	<b>24.8%</b>	<b>-0.2%</b>
<i>MSCI USA</i>		25.0%	
<b>US Small Cap</b>	<b>\$2,017</b>	<b>22.6%</b>	<b>-3.8%</b>
<i>MSCI USA Small Cap</i>		26.5%	
<b>Non-US Developed</b>	<b>\$5,896</b>	<b>23.1%</b>	<b>-0.7%</b>
<i>MSCI EAFE + Canada</i>		23.8%	
<b>Emerging Markets</b>	<b>\$8,571</b>	<b>14.3%</b>	<b>0.0%</b>
<i>MSCI Emerging Markets</i>		14.3%	
<b>World Equity</b>	<b>\$5,655</b>	<b>23.9%</b>	<b>1.0%</b>
<i>MSCI AC World</i>		23.0%	

- Four new manager relationships
  - Includes a Japan specialist manager in the Developed International portfolio
- Two terminations

# Hedge Fund Update

## Hedge Fund Portfolios

As of 6/30/2014

	<u>Assets</u> (\$ Millions)	<u>Return</u> (1-Year)	<u>Alpha</u> (1-Year)
<b>Directional Hedge Funds</b>	<b>\$6,442</b>	<b>13.2%</b>	<b>5.5%</b>
<i>HFRI Fund of Funds Composite</i>		7.7%	
<b>Stable Value Hedge Funds</b>	<b>\$5,193</b>	<b>5.1%</b>	<b>-1.5%</b>
<i>HFRI Fund of Funds Conservative</i>		6.6%	

- In 2011, the Texas Legislature approved an increase in the limit to hedge funds from 5% to 10% of Trust assets
  - As of June 30, 2014, TRS has 8.9% invested in external hedge funds
- The Board approved an increased target allocation from 4% to 9% in September 2011
- The Directional Hedge Fund portfolio was launched in October 2011

# Directional Hedge Fund Portfolio

Directional Hedge Fund Objectives	Status	Details
Focus on equity and market sensitive hedge funds		<ul style="list-style-type: none"> <li>Correlation to MSCI AC World: 0.8</li> </ul>
Core strategies have moderate market sensitivity, lower volatility than equities		<ul style="list-style-type: none"> <li>Beta to MSCI AC World: 0.3</li> <li>Directional HF Volatility: 4.2%</li> <li>MSCI AC World Volatility: 12.3%</li> </ul>
Expected to outperform equities when markets are down, but will underperform strong markets		<ul style="list-style-type: none"> <li>90% hit rate vs. equity in equity down months</li> <li>Average monthly excess return over equities in down months: 1.9%</li> <li>Inception to date return of 10.2% versus MSCI AC World 19.3%</li> </ul>
Expected to outperform US Treasuries over the long term		<ul style="list-style-type: none"> <li>10.2% vs. Treasuries<sup>1</sup> 1.2%</li> <li>Current 10-year Treasury yield-to-maturity: 2.4%</li> </ul>
HFRI Fund of Funds Composite benchmark with target tracking error of 6%		<ul style="list-style-type: none"> <li>4.6% ahead of HFRI benchmark since inception</li> <li>Tracking Error: 1.5%</li> </ul>

Sources: State Street Bank, Bloomberg

Dates: October 2011 to June 2014

Note: Performance is annualized except where noted and is net of fees

<sup>1</sup>Return of BarCap Long Term Treasury from October 2011 to June 2014

# Stable Value Hedge Fund Portfolio

Stable Value Hedge Fund Objectives	Status	Details
Focus on absolute return hedge funds		<ul style="list-style-type: none"> <li>Return: 3.7%</li> <li>Average Sharpe Ratio: 1.5</li> </ul>
Core strategies have low to negative market sensitivity		<ul style="list-style-type: none"> <li>Beta to MSCI AC World: 0</li> </ul>
Expected to have positive returns when markets are down		<ul style="list-style-type: none"> <li>Positive returns in 50% of down equity months since the split (5 of 10 months) – outperforming equities in down months by an average of 2.2%</li> </ul>
Expected to outperform US Treasuries over the long term		<ul style="list-style-type: none"> <li>3.7% vs. Treasuries<sup>1</sup> 1.2%</li> <li>Current 10-year Treasury yield-to-maturity: 2.4%</li> </ul>
HFRI Fund of Funds Conservative benchmark with target tracking error of 4%		<ul style="list-style-type: none"> <li>Return of 3.7% vs. the HFRI benchmark of 5.3%</li> <li>Tracking Error: 2.3%</li> </ul>

Sources: State Street Bank, Bloomberg

Dates: October 2011 to June 2014

Note: Performance is annualized except where noted and is net of fees

<sup>1</sup>Return of BarCap Long Term Treasury from October 2011 to June 2014

# TRS Hedge Fund Portfolios: Alpha and Beta

- Analysis to separate the equity market (beta) return and alpha returns of the hedge fund portfolios reveals that both portfolios have produced a positive alpha return
- As expected, the Directional portfolio has a positive beta return while the Stable Value portfolio has a negligible beta return

Oct 2011 - Jun 2014 (Returns are Annualized)	Beta to MSCI AC World	Beta Return	Alpha Return	Total Return
Directional HF Portfolio	0.28	5.4%	4.8%	10.2%
HFRI FoF Composite	0.21	4.1%	1.5%	5.5%
MSCI AC World Index				19.3%
BarCap Long Term Treasury Index				1.2%

Oct 2011 - Jun 2014 (Returns are Annualized)	Beta to MSCI AC World	Beta Return	Alpha Return	Total Return
Stable Value HF Portfolio	0.03	0.6%	3.1%	3.7%
HFRI FoF Conservative	0.13	2.4%	2.8%	5.3%
MSCI AC World Index				19.3%
BarCap Long Term Treasury Index				1.2%

# Case Study: Customized Fund Investment

- Why – CUSUM Signal
  - Conservative, low volatility hedge fund manager in directional portfolio
  - Underperforming in current “risk-on” environment
- Analysis Conducted
  - TRS Investment – 11 year history with manager
    - Annualized Return: 6.9%
    - Sharpe Ratio: 1.2
    - Beta to Equity: 0.2
  - Performance Attribution – Last 7 years
    - Returns, risk and hit rate of total portfolio and 40 largest positions

	Return	Risk	Sharpe Ratio	Hit Rate Up	Hit Rate Down	Hit Rate All
Manager	5.3%	5.8%	0.7	38%	79%	52%
Top 40 Positions	8.0%	6.8%	1.0	57%	79%	64%

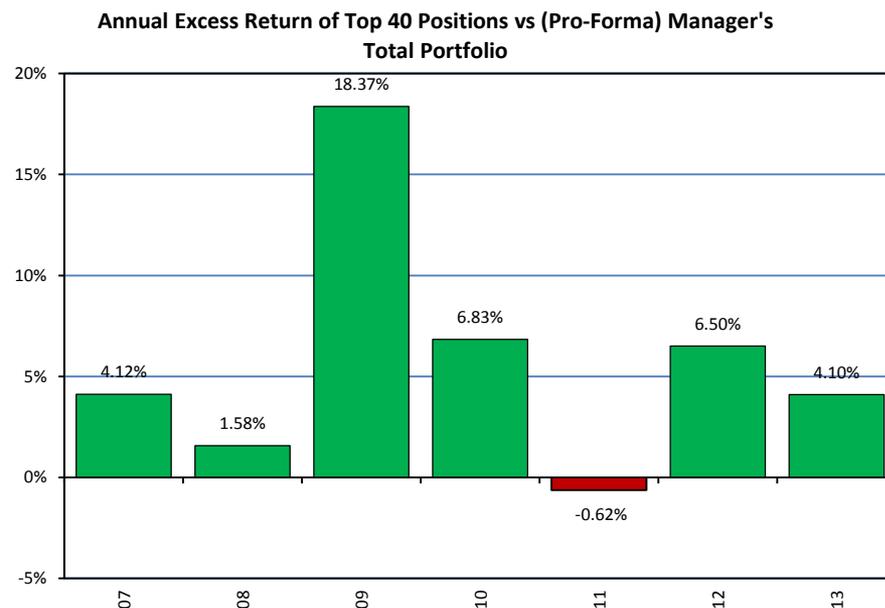
Source: State Street Bank and TRS calculations

Note: Performance is from January 2007 to September 2013



# Case Study: Customized Fund Investment

- Conclusion: Flagship fund is over-diversified for TRS portfolio
  - Highest conviction positions have higher hit rate and drive most performance
  - A concentrated portfolio maintains high hit rate in down markets and improves hit rate in up markets
  - New risk level is in line with peer universe
- Action
  - Converted investment to fund-of-one
  - Added 5% hurdle to incentive fee
    - Equivalent to 1% on net performance
  - Partners in firm are investing alongside TRS



# 2014 Priorities

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- Generate alpha across all portfolios
  - Special focus on US equity portfolios
- Streamline External Public processes for maximum efficiency
- Solid risk management as markets become extended

# APPENDIX

# Delegation Authority Detail

As of June 30, 2014

External Managers	# of Portfolios			Assets (\$ Billions)			Percentage of Trust		
	Agency	LP	Total	Agency	LP	Total	Agency	LP	Total
US Large Cap	8	1	9	\$7.1	\$1.1	\$8.1	5.4%	0.8%	6.3%
US Small Cap	4	2	6	1.3	0.7	2.0	1.0%	0.6%	1.5%
Non-US Developed	5	3	8	3.3	2.6	5.9	2.5%	2.0%	4.5%
Emerging Markets	8	1	9	7.4	1.2	8.6	5.7%	0.9%	6.6%
World Equity	4	1	5	5.5	0.1	5.7	4.3%	0.1%	4.3%
<b>Total Equity</b>	<b>29</b>	<b>8</b>	<b>37</b>	<b>\$24.6</b>	<b>\$5.7</b>	<b>\$30.3</b>	<b>18.9%</b>	<b>4.4%</b>	<b>23.3%</b>
<b>Other Absolute Return</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>\$0.0</b>	<b>\$0.3</b>	<b>\$0.3</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.2%</b>
<b>Public Market SPN</b>	<b>4</b>		<b>4</b>	<b>\$6.4</b>		<b>\$6.4</b>	<b>4.9%</b>		<b>4.9%</b>
<b>Other</b>	<b>2</b>		<b>2</b>	<b>\$0.3</b>		<b>\$0.3</b>	<b>0.2%</b>		<b>0.2%</b>
<b>Totals</b>	<b>35</b>	<b>10</b>	<b>45</b>	<b>\$31.2</b>	<b>\$6.0</b>	<b>\$37.3</b>	<b>24.0%</b>	<b>4.6%</b>	<b>28.6%</b>

- 24% of the 30% Agency Agreement authority is currently utilized

# Risk Parity Categorization Study

Risk Parity is a relatively new asset allocation strategy that focuses on long-only  
Beta management

- **IMD completed a review of Risk Parity's proper designation**
  - Investment consultants
  - Other similar funds
- **Key Question: Is Risk Parity a Hedge Fund?**
  - Consultants: No
  - Similar pension funds: No
- **What is Risk Parity?**
  - An alternative asset allocation methodology that focuses on marginal risk contributions rather than aggregate asset distribution
  - Seeks to reduce outsized exposure to declining equity markets by equalizing risk contributions across all normal economic regimes
  - Relatively passive strategy that relies exclusively on beta to generate real returns and risk controlled leverage to achieve the target Return on Assets (8%); no alpha is normally assumed
  - Cost structure is significantly lower than actively-managed, alpha-seeking hedge funds

# Hedge Funds and the 2014 SAA Proposal

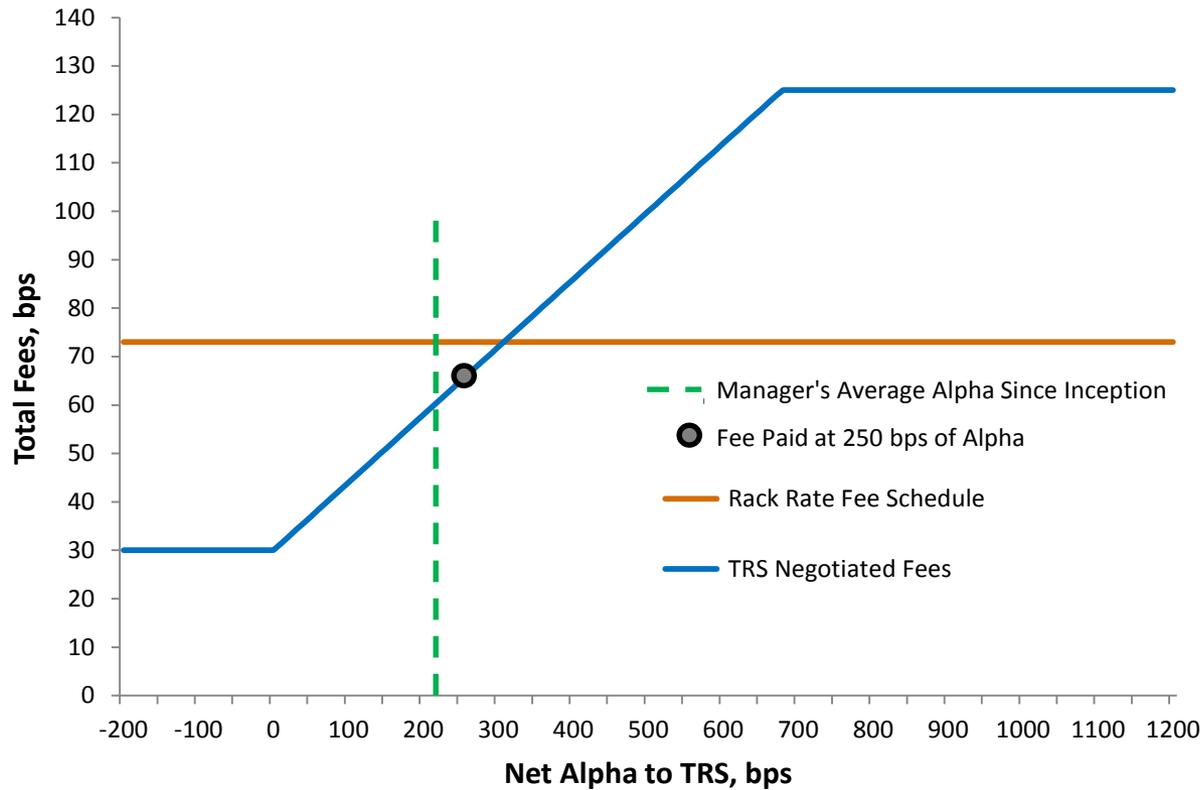
The 2014 SAA Proposal reduces Directional Hedge Funds by 1% and makes no change to Stable Value Hedge Funds, reducing total Hedge Fund exposure from 9% of the Total Trust to 8%

## Why maintain significant exposure to Hedge Fund strategies?

- Hedge funds offer incremental returns (alpha-stacking) as Hedge Fund returns are earned with virtually no impact on trust risk
- Sharpe ratio for both the Directional and the Stable Value Hedge Funds is 50% to over 100% higher than in long-oriented strategies over the past 3-years
- Directional Hedge Funds allow the trust to earn 8% with a higher probability over full market cycles
- Stable Value Hedge Funds should outperform Treasuries (2.4% YTM) long-term while also reducing the Trust's downside risk during equity market declines

# Preferred Fee Arrangement Example

## US Small Cap Manager



# STAR EM Example (06/2007 – 06/2014)

