



INVESTMENT MANAGEMENT COMMITTEE



DECEMBER 2012

Page Intentionally Left Blank

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

(Mr. Barth, Committee Chair; Mr. Colonna; Mr. Kelly; Mr. McDonald; & Ms. Sissney, Committee Members)

AGENDA

**December 13, 2012 – 8:15 a.m.
TRS East Building, 5th Floor, Boardroom**

*The December 13, 2012 meetings of the TRS Board of Trustees and Investment Management Committee will be held by telephone conference call as authorized under Texas Government Code Section 551.130. The Board and Investment Management Committee intend to have quorums physically present at **1000 Red River Austin, Texas 78701 in the TRS East Building, 5th Floor, Boardroom.***

1. Consider the approval of the proposed minutes of the September 13, 2012 committee meeting – Todd Barth.
2. Review Strategic Asset Allocation/Stable Value, Tactical Asset Allocation, Risk, and Strategic Partnerships and Opportunistic Investments – Britt Harris, Mohan Balachandran, Curt Rogers, Jase Auby and Rusty Guinn.

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.

Page Intentionally Left Blank

Tab 1

This page
intentionally left
blank.



Minutes of the Investment Management Committee

September 13, 2012

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on September 13, 2012 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 Kelly
Eric McDonald
Nanette Sissney

A quorum of the committee was present. Others present:

Karen Charleston, TRS Trustee	Conni Brennan, TRS
Charlotte Clifton, TRS Trustee	Dennis Gold, TRS
Chris Moss, TRS Trustee	Tim Wei, TRS
Anita Palmer, TRS Trustee	Angela Vogeli, TRS
Brian Guthrie, TRS	Mary Chang, TRS
Britt Harris, TRS	Denise Lopez, TRS
Ken Welch, TRS	Sylvia Bell, TRS
Jerry Albright, TRS	Katy Hoffman, TRS
Amy Barrett, TRS	Hugh Ohn, TRS
Howard Goldman, TRS	Lynn Lau, TRS
Chi Chai, TRS	Brian Gomolski, TRS
Dale West, TRS	Dinah Arce, TRS
Susanne Gealy, TRS	Scot Leith, TRS
Brad Gilbert, TRS	Dan Herron, TRS
Eric Lang, TRS	Philip Mullins
Sharon Toalson, TRS	Dr. Keith Brown, Investment Advisor
Janis Hydak, TRS	Steven Huff, Fiduciary Counsel
Jase Auby, TRS	Brady O'Connell, Hewitt EnnisKnupp
Hugh Ohn, TRS	Steve Voss, Hewitt EnnisKnupp
Terry Harris, TRS	John Claisse, Albourne America
David Veal, TRS	Ann Fickel, Texas Classroom Teachers Association
Patricia Cantú, TRS	

Mr. Barth called the meeting to order at 9:56 a.m.

1. Consider the approval of the proposed minutes of the July 20, 2012 committee meeting – Committee Chair.

On a motion by Mr. McDonald, seconded by Mr. Kelly, the committee approved the minutes of the July 20, 2012 meeting as presented.

2. Review of the External Public Markets Portfolio – Dale West.

Mr. West provided an overview of the External Public Markets (EPM) Portfolio as of

June 30, 2012, including its performance, organizational structure, and priorities and accomplishments in 2011.

Mr. West presented the certification parameters used in selecting managers.

Ms. Gealy laid out the process of evaluating and monitoring underperforming managers and the re-underwriting and decision process. Responding to questions from Dr. Brown and Mr. Barth, Ms. Gealy explained how staff monitors trend deviation. She shared research data on the cyclicity of manager returns. An extensive discussion followed in response to questions from Mr. McDonald, Mr. Kelly, Mr. Barth, and Dr. Brown regarding how staff makes tactical adjustment decisions by underweighting and overweighting manager allocations based on their long-term and recent performance, the results of staff's re-underwriting process in dealing with underperforming managers, and the impact of terminating underperforming managers. Mr. Voss clarified for Mr. Barth that the current policy for the emerging manager program limits TRS's representation in one single fund to 40 percent of the total assets within that fund.

Mr. West briefly laid out the factors that drove the returns for the equity markets over the past 12 months through June 2012.

Mr. Gilbert provided an overview of the Hedge Fund Portfolio. He presented the portfolio's performance and its role of providing an efficient source of diversification. He confirmed for Dr. Brown that staff still anticipated that the Directional Portfolio would outperform equities in a down market. He updated the progress in expanding the portfolio and highlighted the new hedge fund replication, seeding, and risk parity strategies. Mr. West clarified for Ms. Sissney that the internal policy target for hedge funds is 9 percent, which is composed of the external and replication hedge funds and within the 10 percent legislative cap.

In conclusion, Mr. West presented the 2012 priorities and highlighted the plan to exit from the dislocated credit.

The meeting adjourned at 11:18 a.m.

Tab 2

This page
intentionally left
blank.



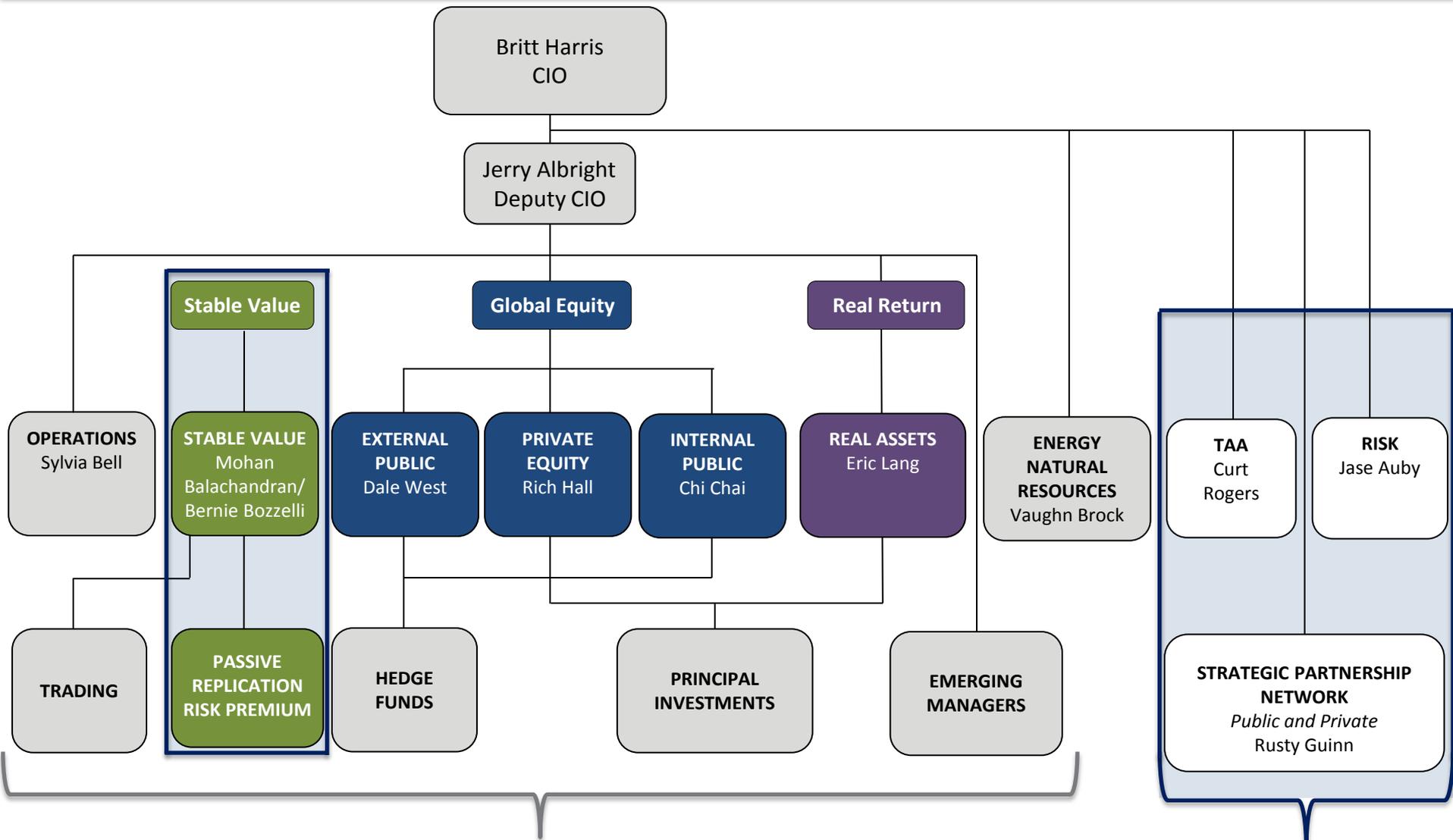
Overview of Strategic Asset Allocation/Stable Value, Tactical Asset Allocation, Risk, and Strategic Partnership Network

Britt Harris

Chief Investment Officer

December 2012

Overview of TRS Investment Management Division



Reviewed between January and September 2012



Focus for today

Leadership

Mohan Balachandran	Curt Rogers	Jase Auby	Rusty Guinn
			
<p>Strategic Asset Allocation/Stable Value</p>	<p>Tactical Asset Allocation</p>	<p>Risk Management</p>	<p>Strategic Partnership Network</p>
<p>Managing Director</p> <p>MS and Ph.D, Physics, Brown University</p> <p>4 Years TRS 14 Years Investment Experience</p> <p>NISA Investment Advisors</p>	<p>Managing Director</p> <p>MS, Engineering, MIT MBA, Finance, UT Austin</p> <p>13 Years TRS 15 Years Investment Experience</p> <p>Rand Corporation</p>	<p>Managing Director</p> <p>BS, Electrical Engineering, Harvard University</p> <p>3 Years TRS 12 Years Investment Experience</p> <p>Barclays Capital and Goldman Sachs</p>	<p>Director</p> <p>BS, Economics, Wharton</p> <p>3 Years TRS 9 Years Investment Experience</p> <p>Credit Suisse-Asset Management Finance Group</p>

Current Responsibilities

Senior Management	Mandate	Assets Under Management	2012 Results (Alpha)
Mohan Balachandran	Strategic Asset Allocation Strategic Beta Hedge Fund Replication Alternative Beta Cash Management	\$27 billion	Positive, on target
Curt Rogers	Tactical Asset Allocation	Overlay Total Trust	\$104 million value-added, below target
Jase Auby	Risk Management <ul style="list-style-type: none"> • Economic Environment • Bubble Monitor • Risk Budget • Risk Strategies Risk Monitoring and Leveraging	Total Trust	On target
Rusty Guinn	Strategic Partnership Network <ul style="list-style-type: none"> • Public • Private Opportunistic Investments Strategic Research	\$12 billion	Positive, below target alpha Top 10% competitive rank

- \$40 billion of total Trust value of \$112 billion
- TAA and Risk Management both on Total Trust
- Fifteen investors across four areas

2013 Priorities (Preliminary)

Group	2013 Priorities (Preliminary)
SAA/Stable Value	<ul style="list-style-type: none">• Develop additional sources of return via alternative betas<ul style="list-style-type: none">• High Sharpe Ratio• Uncorrelated• Low cost• Further enhance Hedge Fund replication capability• Manage Strategic Asset Allocation process
TAA	<ul style="list-style-type: none">• \$250 million of Value Add• Expand current TAA process with four additional models• Increase and standardize data inputs
Risk Management	<ul style="list-style-type: none">• Introduce new risk management strategies• Complete contingent hedging research• Identification of systemic market risks
Strategic Partnership Network	<ul style="list-style-type: none">• Fully implement new investment unit• Expand information exchange between SPN and the IMD• Generate unique research and investments



Strategic Asset Allocation/Stable Value

Mohan Balachandran

Managing Director

December 2012

Agenda

- I. Mandates and Organization
- II. Performance
- III. Strategic Asset Allocation
- IV. Review of Stable Value Portfolio
- V. Hedge Fund Replication
- VI. Enhanced Commodity Alpha Strategy (ECAS)
- VII. 2013 Priorities (Preliminary)

Mandate

Strategic Asset Allocation

- Long-term target development
- Maintain Trust cash positions at long-term target
 - Beta management (active and passive)
 - Cost effectiveness

Cash/Liquidity Management

- Liquidity management
- Securities Lending

Quantitative Active Alpha Streams

- Enhanced Commodity Alpha Strategy (ECAS)
- Quantitative Vector Fund (QVF)
- Alternative Beta/Risk Premium in R&D

Cross-Division Investments

- Hedge Fund replication
- Gold and precious metals
- Dislocated Credit
- Unique Situations

Strategic Asset Allocation and Stable Value Group



Mohan Balachandran, Ph.D.
Managing Director
MS and PhD, Physics, Brown University
4 years TRS
10 years NISA Investment Advisors



Tim Jones, Ph.D.
Sr. Investment Manager
Absolute Returns Strategies,
Risk Premium Research
MS and PhD, Economics, UT Austin
4 years TRS
1 year JP Morgan



Matt Talbert, Ph.D.
Sr. Associate
Risk Premium Research,
Hedge Fund Replication
MS and PhD, Economics, UT Austin
1 year TRS
(Joint with Risk)



Hasim Mardin
Contractor
FX, Rates
MS, Economics, UT Austin
2 years TRS



Babette Ruiz
Team Support
2 years TRS
15 years experience

SAA/Stable Value Portfolio Performance

	Strategic Target	September 30, 2012			12-Month		Tracking Error ¹
		Total (\$bn)	Strategic Beta	Active Alpha	Return	Excess Returns	
Large Cap Value	9.0%	\$14.2	\$1.0		5.7% ⁴	0.0% ⁴	4
Large Cap Growth	9.0%	\$10.8	\$0.2		7.5% ⁴	0.4% ⁴	4
Small Cap	2.0%	\$1.6	\$0.2		31.2%	-0.7%	1
Non-US Developed	15.0%	\$14.5	\$1.1		14.2%	0.5%	5
Emerging Markets	10.0%	\$12.1	\$1.1		9.6% ⁵	-2.4% ⁵	70
Directional Hedge Funds	5.0%	\$5.7	\$2.0		10.0%	7.1%	330
Private Equities	12.0%	\$13.0	\$0.0				
Total Global Equity	62.0%	\$72.0	\$5.5				
Stable Value Hedge Funds	4.0%	\$4.0	\$0.0				
Enhanced Commodities (ECAS) ²	0.0%	\$0.0 ³		\$0.0			3% vol
Quantitative Vector Fund (QVF)	0.0%	\$0.0		\$0.0	-1.7%	-1.7%	10% vol
Total Credit OAR	0.0%	\$1.9					
Long Treasuries	13.0%	\$12.0	\$12.6		6.7%	0.4%	8
Net Cash	1.0%	\$2.2	\$3.0				
Total Stable Value	18.0%	\$20.2	\$15.6	\$0.0			
US TIPS	5.0%	\$5.3	\$5.3		9.2%	0.1%	12
Commodities	0.0%	\$0.9	\$0.0				
REITS	2.0%	\$0.7	\$0.6		32.7%	0.2%	16
Real Assets	13.0%	\$13.4	\$0.0				
Total Real Return	20.0%	\$20.2	\$5.9	\$0.0			
Total Plan	100.0%	\$112.4	\$27.0	\$0.0			

¹Predicted tracking error in basis points

²Historical annualized returns: 8.4%; Historical Risk: 3.1%

³As of December 2012, net notional exposure was zero and gross exposure was \$460 million

⁴Denotes one quarter

⁵Denotes year-to-date

Long-Term Outlook

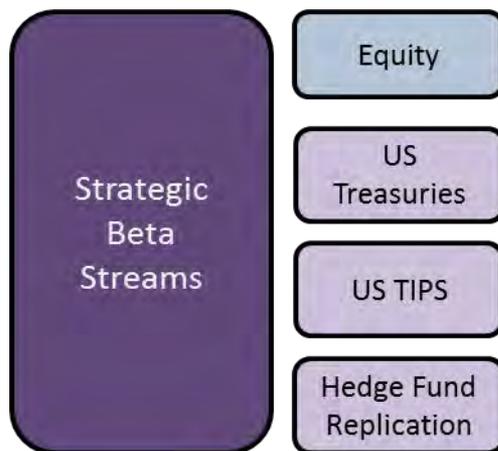
Actuarial Data (Fiscal Year 2012)

Duration of Trust Liabilities	24 Years
Projected Exhaustion Date	2065
Funded Ratio	82%
Member and State Contributions	\$4.4 billion
Benefit Payments	\$7.8 billion

Projected Returns (Passive Only)

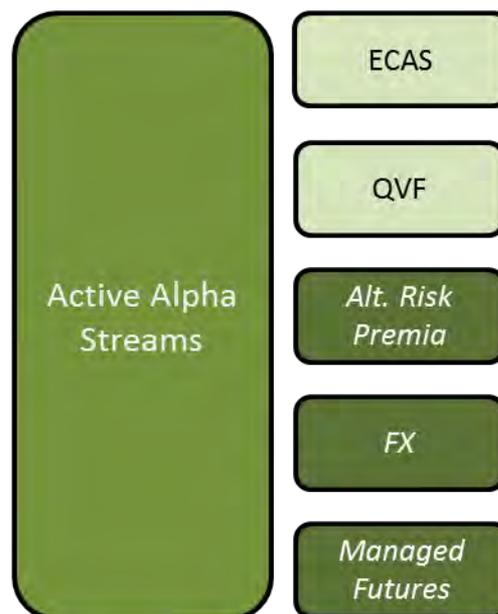
	Intermediate Return	Long-Term Return
Global Equity	6.4%	11.4%
Stable Value	1.4%	3.5%
Real Return	4.5%	6.9%
Total	4.5%	8.4%

Portfolio Structure



- Strategic Beta: Manage to a minimum tracking error/maximize information ratio objective

- Equity portfolios fully replicate the index subject to policy constraints
- Treasury and TIPS portfolio are actively managed with low tracking error
- Hedge Fund Replication using equity factors and systematic strategies



- Active Alpha: Manage to maximize Sharpe Ratio, i.e., absolute return

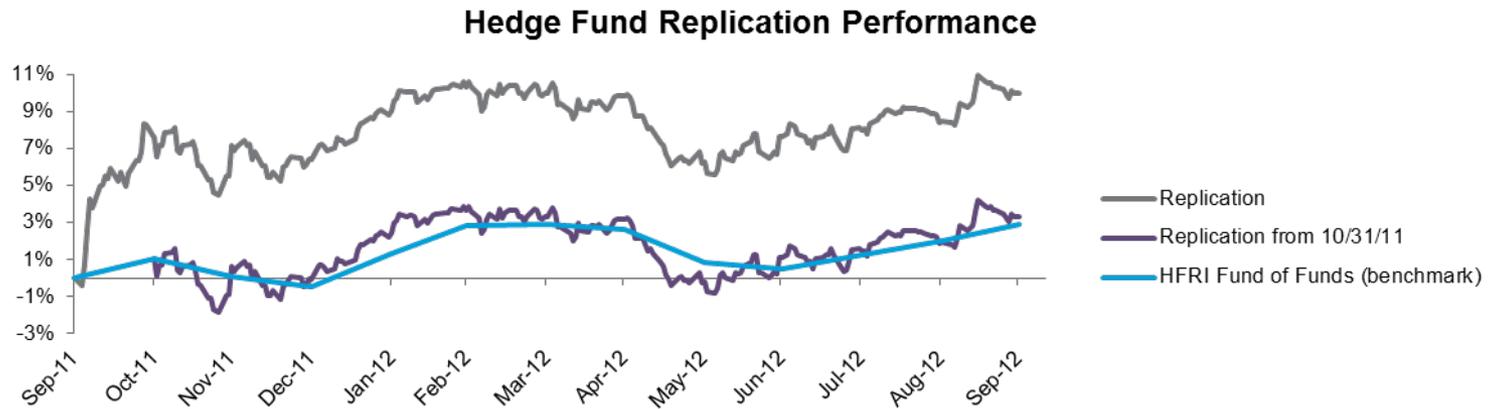
- Enhanced Commodity Alpha Strategy (ECAS) is a commodity alpha strategy
 - Retained alpha after GSCI transition benchmark expired
- Quantitative Vector Fund (QVF) is a GTAA strategy focused on G-10 countries - equities, commodities, currencies and bonds
 - Constant volatility target of 10% annually
- Alternate Risk Premium portfolio is in R&D phase
- Foreign Exchange (FX) is a currency alpha strategy in R&D phase, a version of which is used in Hedge Fund Replication
- Managed Futures is in R&D phase and is a momentum-based strategy

Note: Strategies in italics are under development.

Sharpe Ratio = $(\text{Total Return} - \text{Risk Free Rate}) / \text{Standard Deviation of Total Return}$

Hedge Fund Replication

- An expanded allocation to hedge funds was approved by the Legislature in 2011.
- To reduce Trust tracking error, while new managers were selected, a “market beta”-based hedge fund replication strategy was initiated in October 2011.
- This strategy allocates long and short positions across eleven market indices to broadly capture the risk and return profile of the hedge fund benchmark.
- For its first year the replication has performed broadly as expected, with an initial month of outperformance followed by close tracking of the benchmark. Excluding October’s outsized return, the replication achieved tracking error of 2.8%.



	Realized			
	Return	Alpha	Tracking Error	Expected Tracking Error
TRS Replication	10.0%	7.1%	7.0%	3.3%
TRS Replication (Ex-Oct 2011)	2.3%	0.4%	2.8%	3.3%
EPU Directional Hedge Funds	6.2%	3.3%	1.7%	
HFRI Benchmark	2.9%			

Hedge Fund Replication Enhancements

Hedge Fund Replication Allocation

	Dollar Allocation				Risk Allocation			
	Current Replication		Enhanced Replication		Current Replication		Enhanced Replication	
	Notional (\$ mil.)	Weight	Notional (\$ mil.)	Weight	Volatility	Weight	Volatility	Weight
Market Beta Exposure								
Equity Factor	\$1,945	100.0%	\$1,252	64.4%	5.2%	100.0%	3.8%	75.6%
Hedge Fund Beta Strategies								
Event-Driven			\$309	15.9%			0.7%	14.8%
Arbitrage			\$126	6.5%			0.4%	7.7%
Macro			\$257	13.2%			0.1%	1.9%
Total Portfolio	\$1,945*	100.0%	\$1,945*	100.0%	5.2%	100.0%	5.0%	100.0%

- Strategies are split into four broad themes reflecting the risk premia underlying hedge fund styles
- Equity Factor represents the market exposures of the hedge fund universe and is currently comprised entirely of the original market beta replication
- Hedge Fund Beta Strategies will initially only account for approximately one-third of the capital allocation to the hedge fund replication and one-fourth of the risk

* As of 9/30/12. This will be lower by the end of Q1 2013.

Enhanced Commodity Alpha Strategy (ECAS)

- TRS has managed a commodities portfolio since 2007 with a 2% allocation benchmarked to the S&P GSCI Index
- TRS used enhanced commodity strategies which added about six basis points to the overall Trust alpha over a three-year time frame
- The goal of ECAS is to capture commodity alpha to enhance Trust returns
- ECAS is:
 - Diversified – Enhanced strategies sourced across commodities and across providers
 - Beta neutral – Long/Short Strategy with no beta exposure to commodities at a low risk budget (3%)
 - Generates alpha – Strategy seeks to add 2-5 basis points of alpha at the Trust level

Enhanced Commodity Alpha Strategy

- Exposure to each commodity strategy is approximately risk weighted
- Back-test performance statistics over last eight years:
 - Annualized Returns: 8.4%
 - Annualized Standard Deviation: 3.1%
 - Sharpe Ratio: 2.6
 - Hit Rate: 80%
- Back-test results are consistent with realized performance over the three years that TRS had exposure to these enhanced strategies
- Portfolio includes 22 enhancements made to 22 of the 24 GSCI commodities (excludes gold and silver) provided by:
 - Barclays
 - Citi
 - Deutsche Bank
 - Goldman Sachs
 - JP Morgan
 - Societe Generale

2013 Priorities (Preliminary)

Priority	Objective
Alternative Beta Research and Development	<ul style="list-style-type: none">• Develop additional sources of return via alternative betas• Portfolio construction using alternative beta
Hedge Fund Replication	<ul style="list-style-type: none">• Continued development and refinement of the Hedge Fund replication platform• Replication of sub-sectors of the Hedge Fund benchmarks• Transition from pure replication to portfolio of Hedge Fund beta
Strategic Asset Allocation	<ul style="list-style-type: none">• Manage the Strategic Asset Allocation process



Tactical Asset Allocation

Curt Rogers

Managing Director

December 2012

Agenda

- I. Mandate and Organization
- II. Review of Performance and 2012 Priorities
- III. Overview of Process and Implementation
- IV. 2013 Priorities (Preliminary)

Mandate and Risk Constraints

Mandate

- Annual alpha of 25 basis points on total Trust
 - One-fourth of the IMD annual target
 - Currently \$250 - 300 million per year
 - Publicly traded asset classes

Risk Constraints

- Consistent with policies of total Trust
- Policy bands
 - $\pm 5\%$ around long-term, asset allocation weights
 - Exception is Long-Term Treasuries (0% minimum, 13% neutral, and 20% maximum)

Tactical Asset Allocation Group



Curt Rogers, CFA, CAIA, FRM
Managing Director
MS, Engineering, MIT
MBA, Finance, UT Austin
13 years TRS



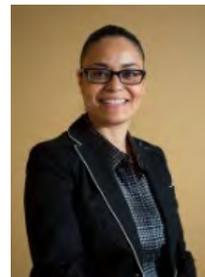
Jingshan Fu, PhD
Sr. Associate
PhD, Harvard
18 years TRS



Jean-Benoit Daumerie
Associate
BS, Engineering, U Penn
MBA, Finance, Rice University
1 year TRS
2 years Hewlett Packard



Daniel Ting
Associate
BBA, Finance and Economics
UT Austin
1 year TRS
5 years DE Shaw



Babette Ruiz
Team Support
2 years TRS
15 years experience

TAA Performance

Trust Level Alpha (Basis Points)

Asset Class	2012	3-year (annualized)	Since Inception*
US Large Cap Growth	-2	9	6
US Large Cap Value	19	1	0
US Small Cap	-20	-14	-15
Non-US Developed	1	14	12
Emerging Markets	0	-17	13
US Treasuries	19	12	9
Credit	-1	18	25
US TIPS	-2	-2	1
Commodities	1	-2	-3
REITs	0	-1	0
TOTAL	15	18	48

*TAA annualized inception-to-date as of October 1, 2008
TAA Performance as measured at the fund level in Trust-level basis points
All periods as of September 30, 2012



2012 Priorities

Dynamic Factor Model

- Classic TAA focuses on long-term relationships between factors and asset class prices
- Dynamic Factor tracks the short-term changes in the factors that drive asset class prices
- Dynamic Factor engine has now been built and our focus shifts to integrating Classic with Dynamic

“DataCube” Factor Warehouse

- A single database used as a central repository for thousands of factors
- Updated daily and maintains data integrity via automated monitoring and reporting
- DataCube has been built and our focus shifts to connecting all IMD models to this structure

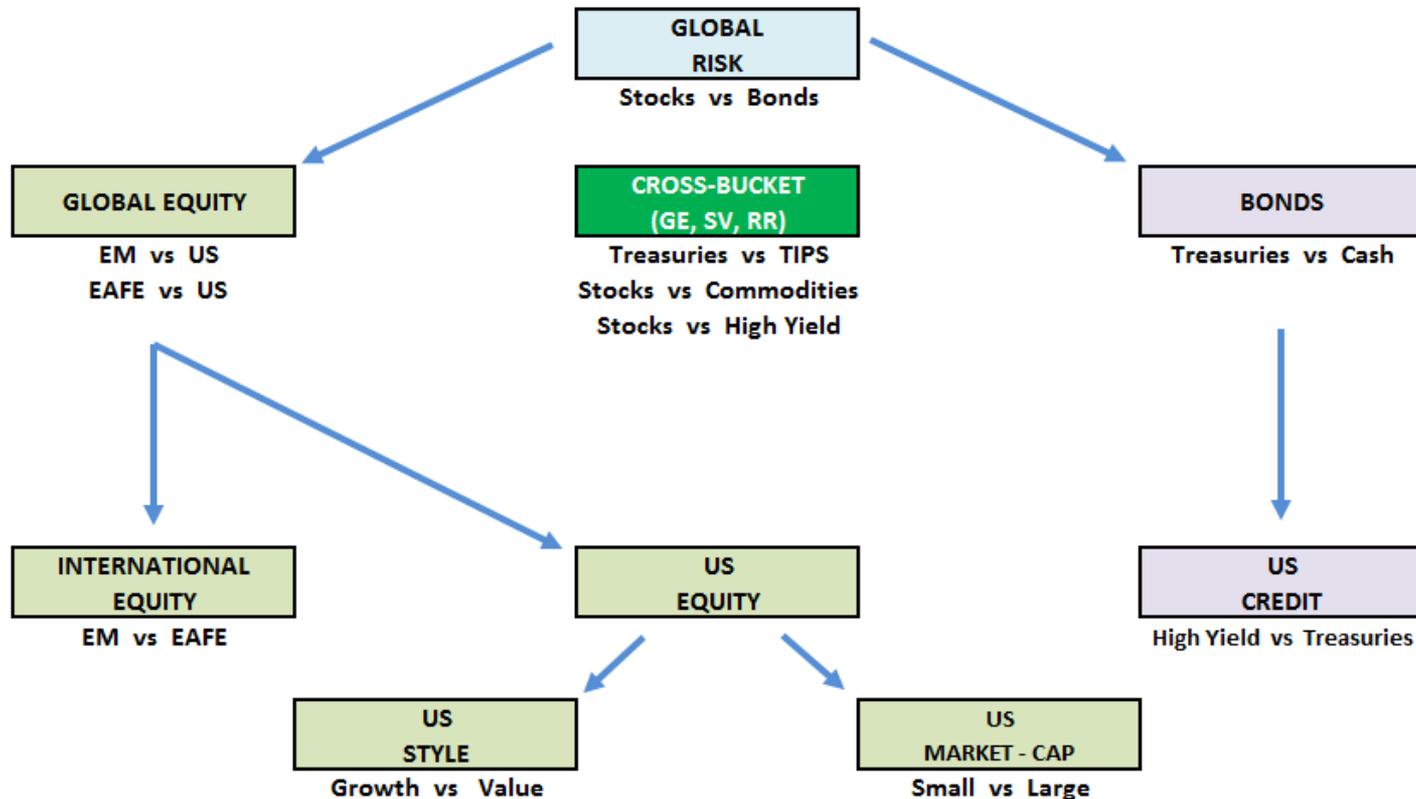
Currency Model

- Fair Value Model: Identifies misalignments in currency pairs using inflation, interest rates and other factors
- Forecast Model: Forms expectations for currency returns based on these misalignments
- Initial successful application in hedge fund replication, focus now shifts to TAA

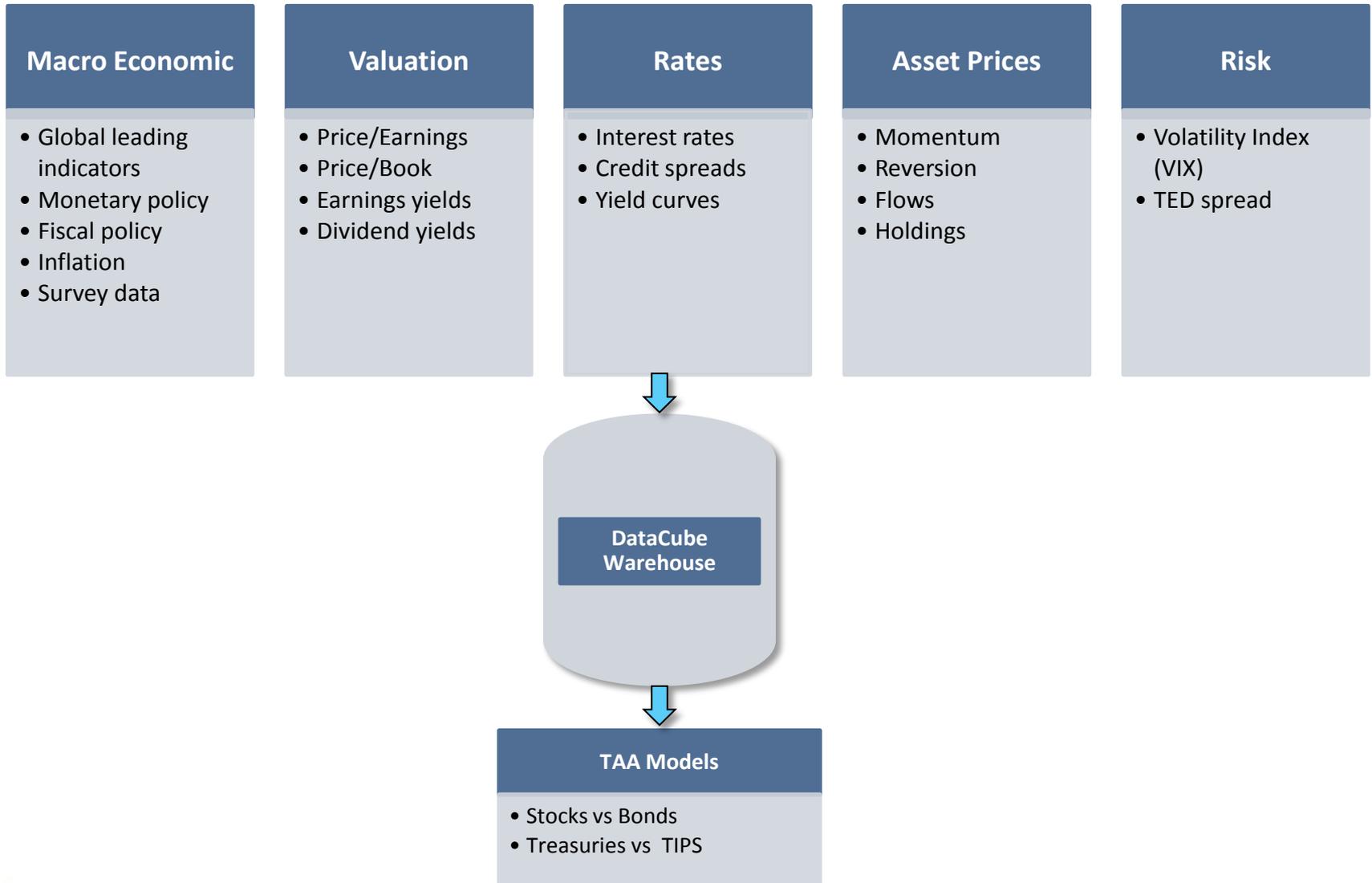
TAA Process and Implementation

- “Classic TAA” Decision Tree Framework

- With 11 asset class pair models
- Factor-based, updated monthly



Factor Classifications



Additional Inputs

Classic TAA Models (85%)

- Relative targets based on in-house models focusing on longer-term relationships

Strategic Partner Positions (10%)

- Relative positions of partners within their own TAA portfolios
- Barclays, BlackRock, JP Morgan, Morgan Stanley, Neuberger Berman

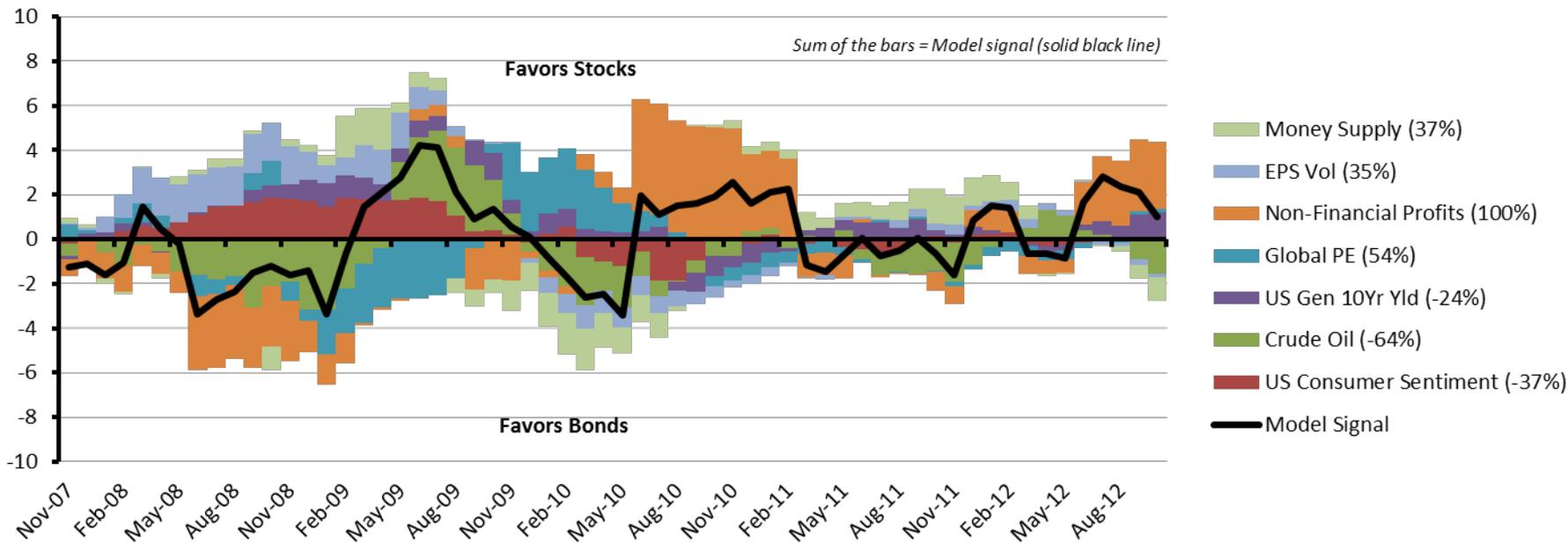
Dynamic Factor (5%)

- Relative targets based on in-house models focusing on short-term relationships

Stocks vs. Bonds Example

Last Five Years

Date	Signal	Favors	Signal Trend	Important Model Factors
June 2008 <i>(Pre-Lehman)</i>	-3.4	Bonds	Signal continues to favor bonds until 03/2009	<ul style="list-style-type: none"> Consumer sentiment is a contrarian tailwind High estimate volatility is a tailwind Non-financial profits, valuation and oil are headwinds
March 2009 <i>(Equity Trough)</i>	+1.4	Stocks	Signal increases to +4 (strongly favoring stocks) by June 2009	<ul style="list-style-type: none"> Consumer sentiment still a contrarian tailwind Low rates and high estimate volatility are tailwinds Valuation is a headwind
September 2012 <i>(Present)</i>	+2.1	Stocks	Signal continues to move toward neutral (0)	<ul style="list-style-type: none"> Non-financial profit growth and low rates are tailwinds Money supply and oil are modest headwinds



Implementation, Compliance and Attribution

- Implementation
 - Derivatives-based with any net exposure fully funded
 - Efficient and fully effective
 - Savings-to-date total \$222 million
- Compliance
 - Continual testing by State Street Bank
 - Disclosure reported to Risk Committee of the Board
 - Audited three times by three different groups* with no major findings
- Performance and Attribution
 - Performance independently calculated by State Street Bank
 - Performance and positions reported monthly (in Transparency Report)
 - Performance estimate provided to Management Committee daily

**Huron Consulting and Internal Audit 2008; Internal Audit 2010; IFS 2011*

2013 Priorities (Preliminary)

- Generate \$250-300 million of alpha within risk parameters
- Continue to refine current systems
 - Classic TAA
 - Dynamic Factor
- Expand valuation models
 - Country equities
 - Sovereign debt
 - Currencies
- Continue to improve data inputs
 - Quality, breadth, timing
 - Expand usage of DataCube factor warehouse



Risk

Jase Auby

Managing Director

December 2012

Agenda

- I. Risk Mandate
- II. Risk Group
- III. Key Risk Signals
 - 1. Bubbles
 - 2. Macro Environment
 - 3. CUSUM
- III. 2012 Priorities
 - 1. Risk Parity Portfolio
 - 2. Contingent Hedging
 - 3. Low Volatility with Overlay
- IV. 2013 Priorities (Preliminary)

Risk Mandate

Managing	Signals	<ul style="list-style-type: none">• Identify and monitor key statistical thresholds, which when crossed, will cause specific investigation and action• Bubble Signals and CUSUM Signals are important types of Risk Signals
	Budgeting	<ul style="list-style-type: none">• Manage how Trust allocations and correlations combine to either overweight or underweight the risk of the Trust• Focus upon Tracking Error and Value-at-Risk
	Strategies	<ul style="list-style-type: none">• Investment strategies to improve the return and risk profile of the Trust• Risk Parity, Contingent Hedging, and Low Volatility with Overlay strategies are three examples
Monitoring	Compliance	<ul style="list-style-type: none">• Jointly, with Investment Compliance, monitor and resolve Compliance Issues
	Monitoring	<ul style="list-style-type: none">• Prepare useful Risk Reports• Monitor Trust risks which include Market, Leverage, Liquidity, Concentration, Currency, Counterparty and other risks
	Certification	<ul style="list-style-type: none">• Certify all new External Public investments with respect to Market Factors, Leverage, Drawdown History, Liquidity, Risk Management Systems and Audit History• Review new strategies within External Private investments

Risk Group



Jase Auby, CFA
Managing Director
BS, Electrical Engineering, Harvard University
3 Years TRS
12 Years
Barclays Capital and Goldman Sachs



James Nield, CFA
Sr. Investment Manager
MBA, Finance,
New York University
3 Years TRS
3 Years Ford Motor Co.



Matt Talbert, PhD
Sr. Associate
MS and PhD, Economics,
UT Austin
1 Year TRS

(Joint with Stable Value)



Mark Telschow, CFA
Sr. Associate
BS, Civil Engineering,
UT Austin
2 Years TRS
1 Year Austin Capital
Management



Mike Simmons
Contractor
MPA, Accounting,
UT Austin
1 Year TRS



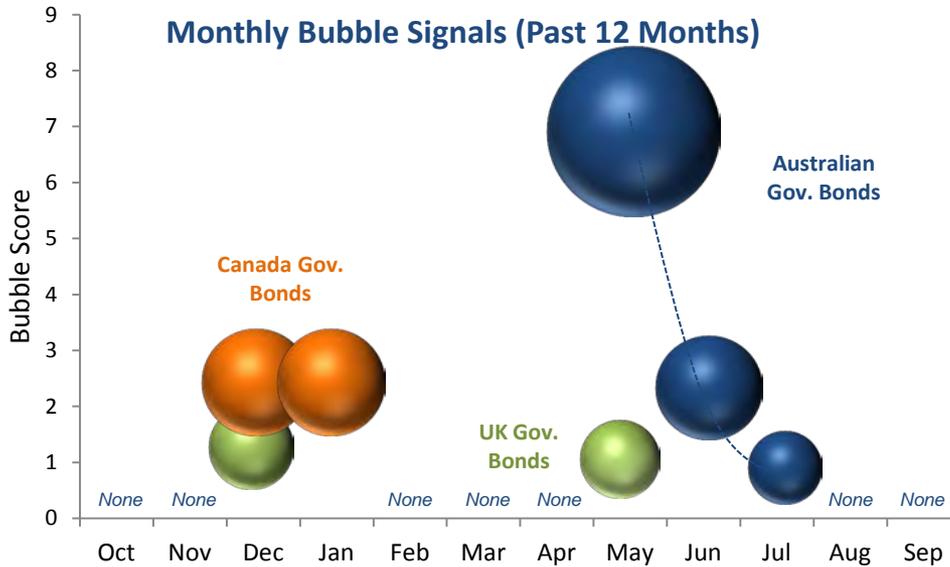
Stephen Kim
State Street Employee
MBA, Finance,
UT Austin



Babette Ruiz
Group Support
2 Years TRS
15 years experience

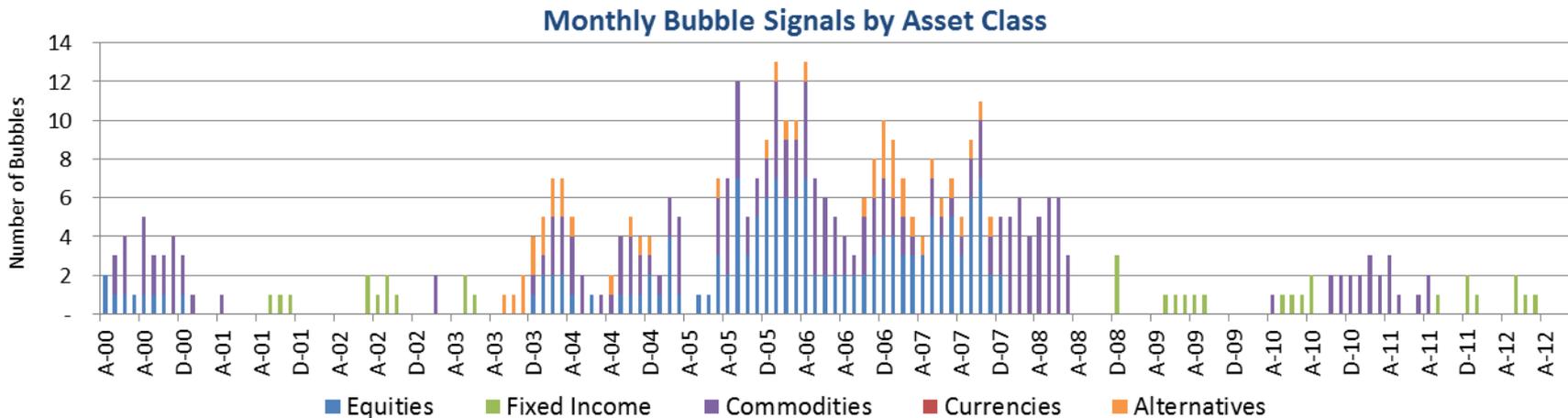
Key Risk Signals

1. Bubbles



- All recent bubble signals are from developed market sovereign bonds

Asset	Bond Yield			
	7 Years Prior	6 Mo. Prior	At Signal	Sep 2012
Canadian Gov. Bonds	4.3%	3.1%	1.9%	1.7%
UK Gov. Bonds	4.5%	3.4%	2.0%	1.7%
Australian Gov. Bonds	5.2%	4.5%	2.9%	3.0%

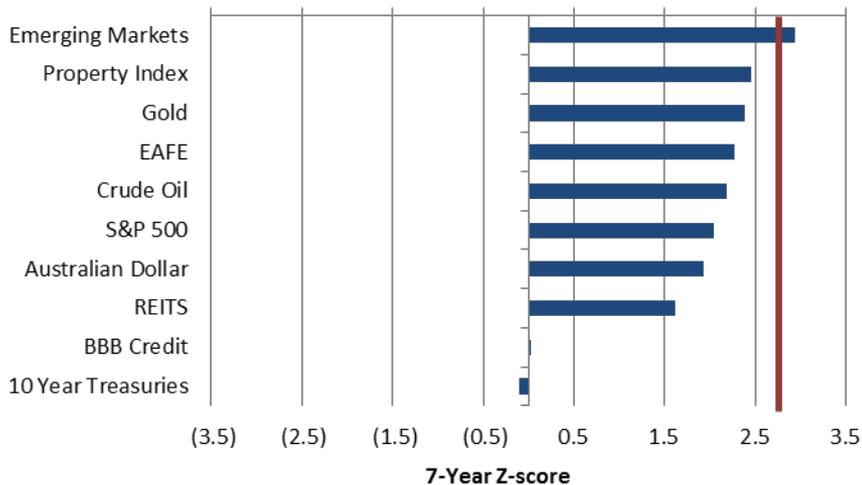


Bubble Monitor signal is based on 3 factors: 1) A rolling 7-year Z-score; 2) Change in correlation to a benchmark; 3) Absolute change in price within the past 7 years

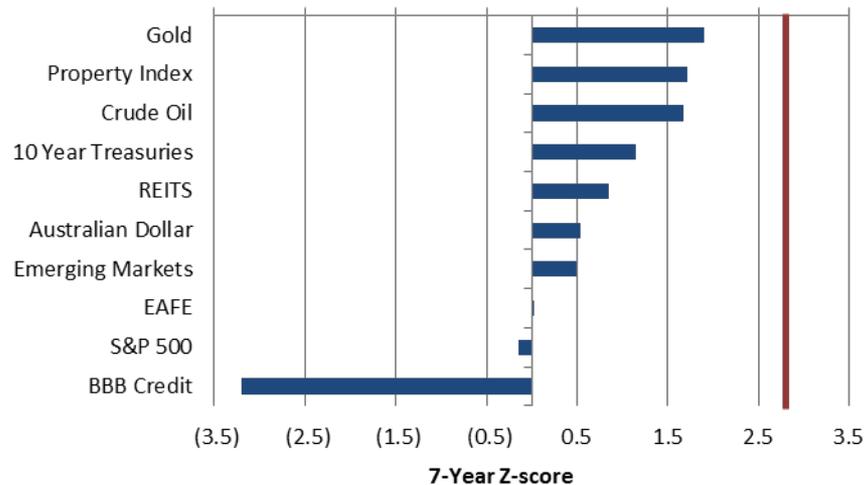
Key Risk Signals

1. Bubbles

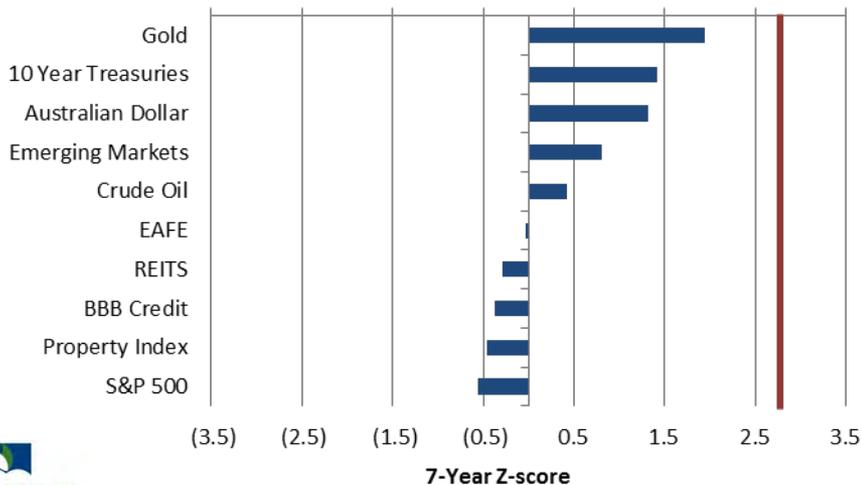
Bubble Level Monitor: September 2007



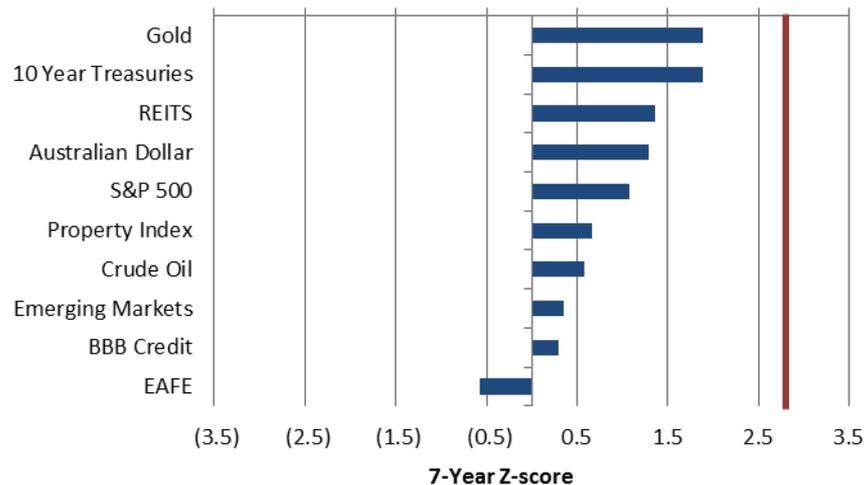
Bubble Level Monitor: September 2008



Bubble Level Monitor: September 2009



Bubble Level Monitor: September 2012

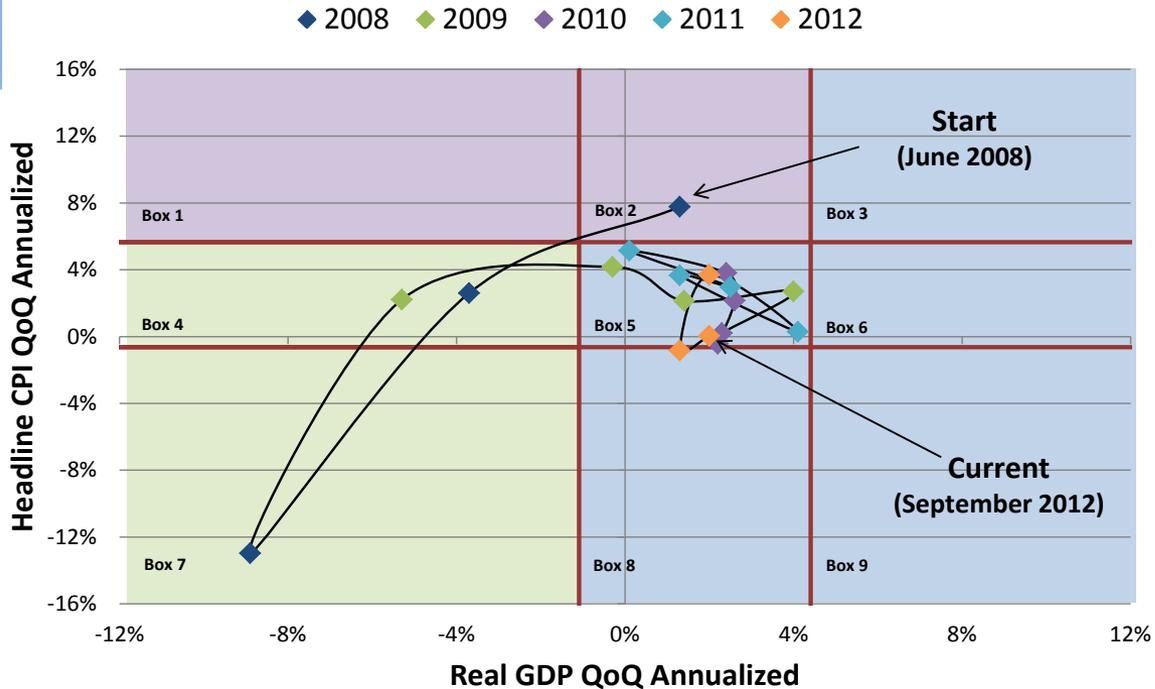


Key Risk Signals

2. Macro Environment

Real Return	Global Equity
Stable Value	

US Macro Environment



- US is currently in Box 5

Global Macro Environment

Region	Q4 2011	Q1 2012	Q2 2012	Q3 2012
US	Box 5	Box 5	Box 8	Box 5
Non-US G7 ex-Japan	Box 5	Box 5	Box 5	Box 5
Japan	Box 2	Box 2	Box 5	Box 5
EM ex-China	Box 5	Box 5	Box 5	Box 5
China	Box 5	Box 4	Box 4	Box 4

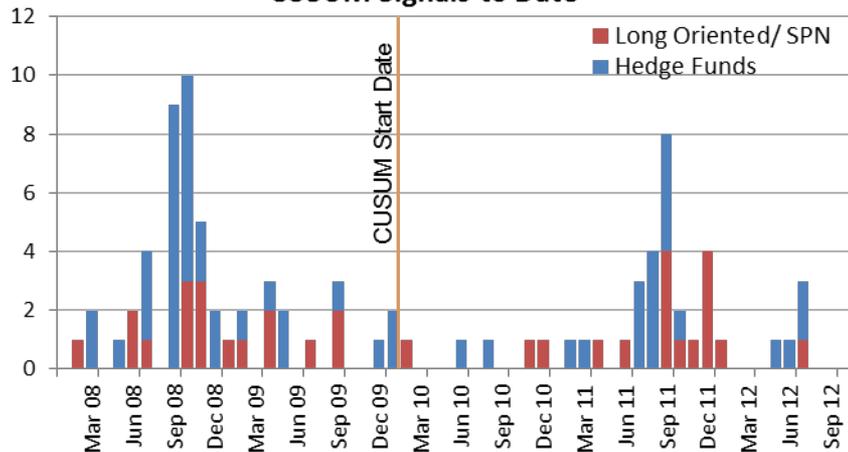
- Most of the world is also in Box 5

Key Risk Signals

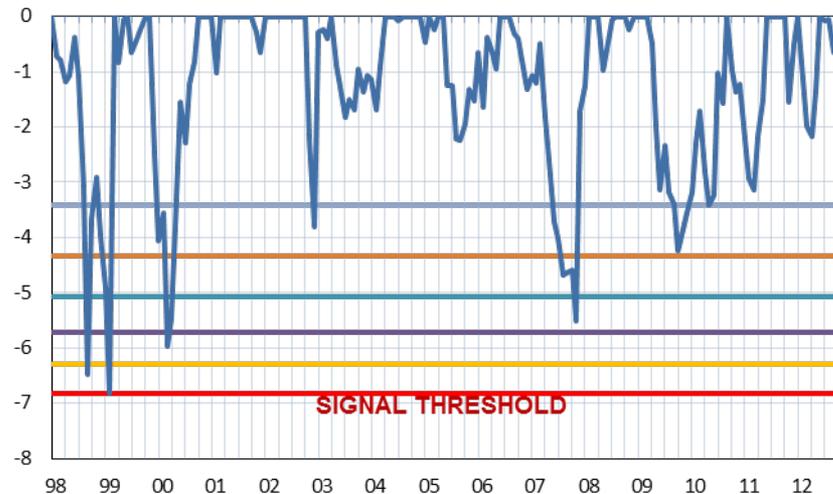
3. CUSUM: External TRS Portfolios

- **CUSUM Signal:** a tool designed to identify patterns of persistent underperformance within portfolios; signal initiates a buy/sell decision
- CUSUM Signals program launched in January 2010

CUSUM Signals to Date



Example: CUSUM Information Ratio Signal



- 37 Portfolio CUSUM Signals to date: 22 Buy Decisions and 10 Sell Decisions (5 in progress)
- **Results are encouraging:**
 - Managers that received a “Buy” rating performed in line with the benchmark on average over the next 12 months
 - Managers that received a “Sell” rating underperformed the benchmark by -7.8% on average over the next 12 months

Key Risk Signals

3. CUSUM: Asset Class Benchmarks *(as of September 30, 2012)*

- Asset class benchmark signals are also used to monitor divergence between asset classes

#	Asset	Benchmark	Latest Signal Date	Return Prior to Signal			Return Following Signal		
				-3M	-6M	-12M	3M	6M	12M
1	Global Stocks	Global Bonds	Sep-11	-18.4%	-21.9%	-10.2%	7.7%	20.6%	17.5%
2	Global Stocks	Cash	Jan-09	-11.6%	-39.8%	-44.0%	9.1%	29.8%	40.7%
3	Global Bonds	Cash	Oct-08	-7.2%	-8.6%	-1.7%	6.2%	5.7%	19.0%
4	Value Stocks	Growth Stocks	Oct-11	-1.4%	-5.9%	-2.6%	-0.6%	-3.3%	NA
5	Large Cap	Small Cap	Apr-10	-8.3%	-13.2%	-12.2%	1.5%	1.3%	-6.4%
6	US Stocks	EAFE Stocks	Jul-07	-2.3%	-7.0%	-7.7%	-1.5%	2.6%	0.4%
7	US Stocks	Emerging Markets	May-09	-30.7%	-43.8%	1.7%	2.2%	-4.2%	-1.4%
8	Emerging Markets	EAFE Stocks	Nov-08	-8.7%	-10.6%	-9.2%	9.4%	32.3%	46.6%
9	Long UST	Credit	Jul-09	-11.4%	-14.0%	-0.6%	-1.7%	-5.3%	-1.2%
10	Long UST	Cash	Jul-09	-1.5%	-3.2%	7.4%	2.4%	0.9%	11.3%
11	Long UST	TIPS	Jul-09	-8.6%	-9.6%	2.5%	-2.7%	-1.5%	7.2%
12	REITS	US Small Cap	Mar-10	-8.9%	-12.6%	-54.8%	13.7%	5.3%	-19.2%
13	GSCI	Long UST	Sep-11	-23.8%	-25.4%	-4.7%	2.5%	11.6%	6.6%
14	Gold	GSCI	Jul-12	-3.0%	-2.7%	-6.3%	NA	NA	NA
Average				-10.4%	-15.6%	-10.2%	3.7%	7.4%	10.1%
Median				-8.6%	-11.6%	-5.5%	2.4%	2.6%	6.9%

- The most recent signal for each asset class pair shows mean-reverting positive performance

2012 Priorities

#	Priority	Result
1	Risk Parity	<ul style="list-style-type: none"> Invested \$500 million with two external managers Created internal research portfolio
2	Contingent Hedging	<ul style="list-style-type: none"> Developed the TRS Global Risk Indicator Created research portfolio that will be tracked and enhanced in 2013
3	Low Volatility with Overlay	<ul style="list-style-type: none"> Created internal research portfolio
4	Trust Liquidity Report	<ul style="list-style-type: none"> Presented report to Board Risk Committee in June Added to Board Risk Report
5	Risk Budgeting Report	<ul style="list-style-type: none"> Incorporated into monthly Management Committee meetings
6	Improved Private Equity and Real Assets Risk Proxies	<ul style="list-style-type: none"> Better modeling of Private Equity and Real Assets risk Plan to add to risk analytics in 2013
7	Trend Deviation Signals	<ul style="list-style-type: none"> Presented research findings to Management Committee Added to Risk Signals process

Items in **bold** will be discussed further on the following slides

2012 Priorities

1. Risk Parity Portfolio

• Objective

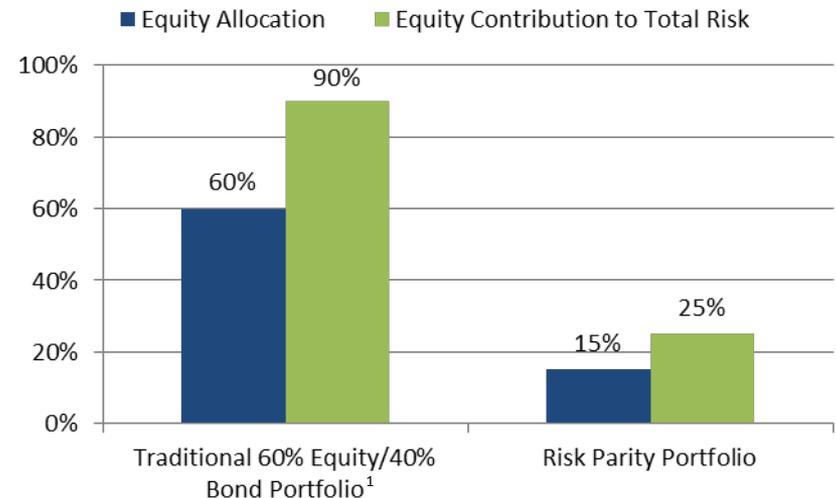
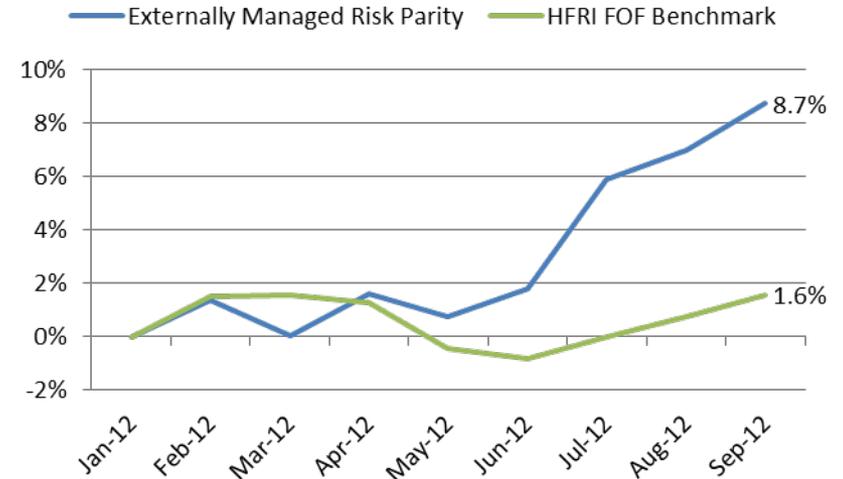
- Better understand this alternative approach to strategic asset allocation
 - Correlation to TRS SAA is 0.7
- Invest \$500 million with two external managers
- Develop internal research portfolio

• Key Risk Parity Concepts

- **Obtain balanced diversification**
- Target equal risk contribution from different asset categories

Portfolio Risk Contribution

Rising Growth (Equities) 25% of Risk	Rising Inflation (Commodities) 25% of Risk
Falling Growth (Bonds) 25% of Risk	Falling Inflation (Bonds/Equities) 25% of Risk



¹MSCI US and Long Treasuries over past 10 years

2012 Priorities

2. Contingent Hedging

- Objective
 - Research a total Trust risk hedging program
- Key Concept
 - Hedges that are “always on” are typically too expensive

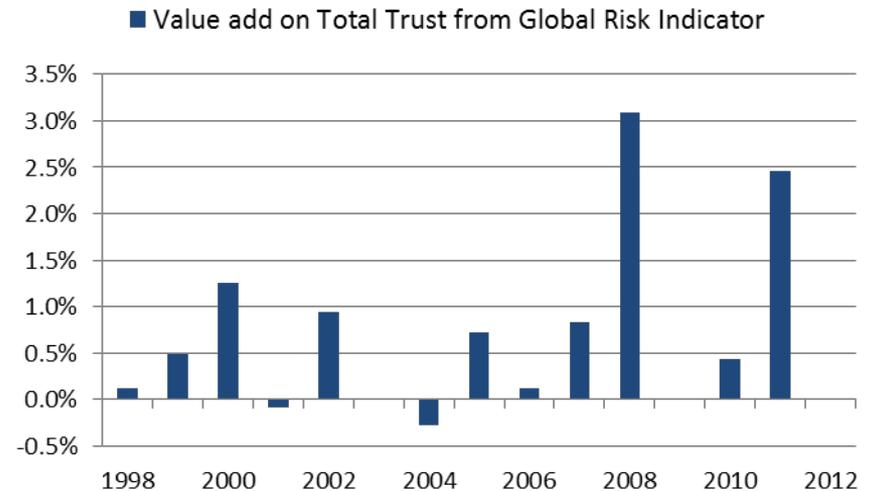
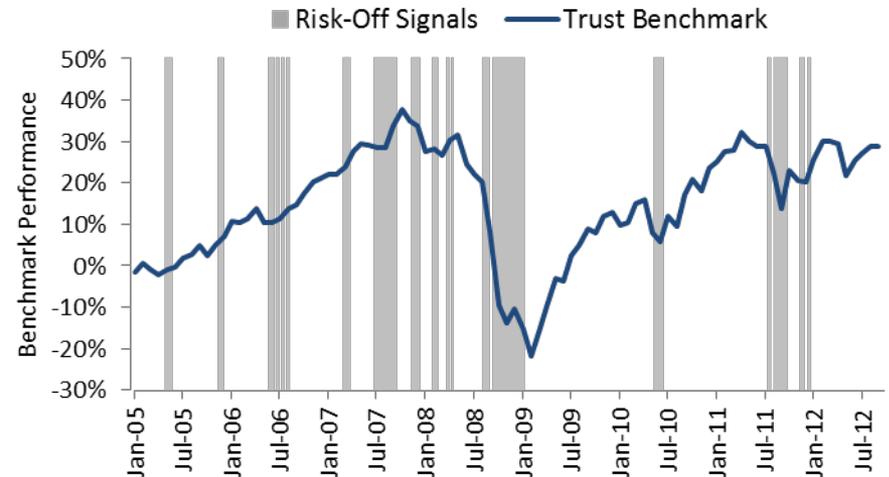


- To be successful, hedging programs cannot be “always on” and instead need to be **contingent** on identifying the riskiest times

2012 Priorities

2. Contingent Hedging Portfolio

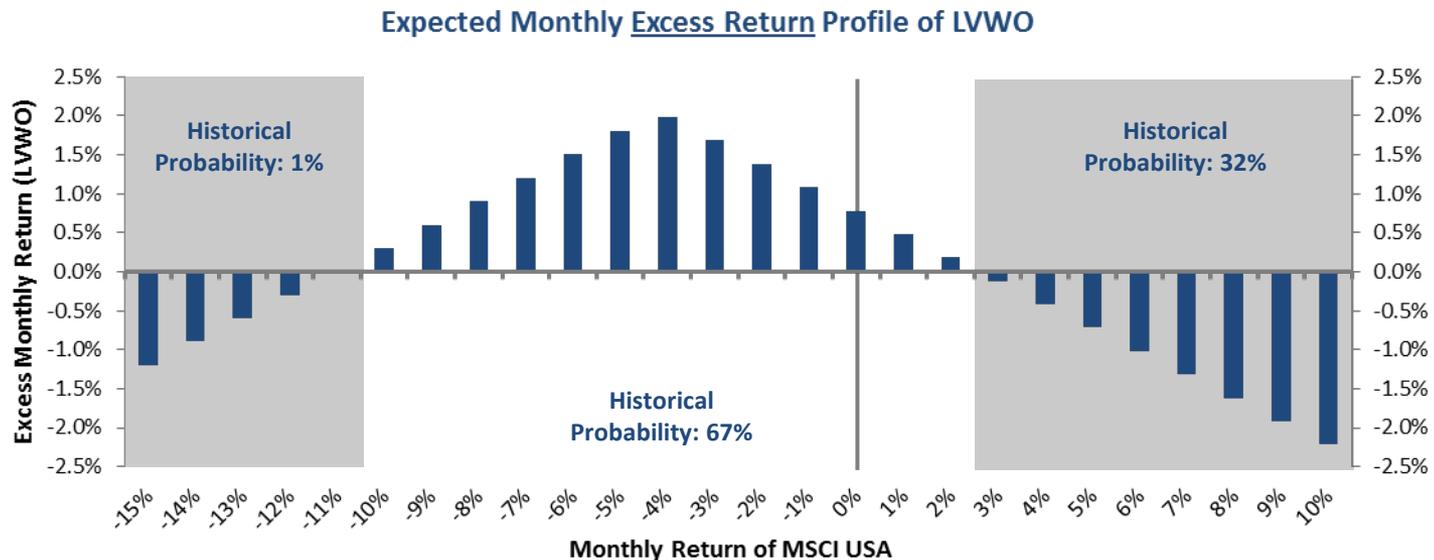
- Our research focused on building a **Global Risk Indicator** to help predict periods of increased volatility
 - Indicator components include select third-party risk indicators, economic surprise indices, and volatility data
 - Risk-off signal occurs approximately 10% of the time
- Results
 - Research portfolio developed to track effectiveness of signal
 - Both VIX futures and US Treasuries appear attractive as hedging instruments
 - Back-tested results are shown in the graph on the right with the tactical hedge sized at 5% of Trust assets



2012 Priorities

3. Low Volatility with Overlay

- Objective:
 - Capitalize on persistent risk premia created by market imbalances
 - Create a research portfolio
- Key Concepts:
 - Buy low volatility stocks which have shown to be generally undervalued relative to high volatility stocks (**Low Volatility**)
 - Because the resulting portfolio is underweight equity beta versus its benchmark, supplemental equity beta is added to the portfolio by selling put options (**Overlay**)



2013 Priorities (Preliminary)

#	Priority	Objective
1	Contingent Hedging Research Portfolio	<ul style="list-style-type: none"> Refine contingent hedging methodology Monitor, enhance, and improve research portfolio
2	Systematic Identification of Market Risks	<ul style="list-style-type: none"> Develop a systematic methodology to calculate the market impact of perceived market risks
3	Measure Hedge Fund Manager Skill	<ul style="list-style-type: none"> Create additional tools and metrics to identify hedge funds that exhibit persistent value add capabilities
4	Risk Certification Update	<ul style="list-style-type: none"> Develop risk factors to better identify manager and portfolio biases
5	Reinsurance	<ul style="list-style-type: none"> Investigate this asset class Work with External Public Markets to determine if an investment is warranted within the Hedge Fund portfolio
6	TRS Add-In	<ul style="list-style-type: none"> Develop an “add-in” library available to the IMD that will provide standardized spreadsheet investment analysis tools
7	Low Volatility with Overlay	<ul style="list-style-type: none"> Improve research portfolio and consider funding a small allocation



Strategic Partnerships and Opportunistic Investments

Rusty Guinn

Director

December 2012

Agenda

- I. Strategic Partnerships and Opportunistic Investments (SPO) Group
- II. Mandates and Organizational Update
- III. Public Strategic Partner Update
- IV. Private Strategic Partner Update
- V. Other Initiatives
- VI. Opportunistic Investment Evaluation
- VII. 2013 Priorities (Preliminary)

Strategic Partnership Group



Rusty Guinn
Director

BS, Economics, Wharton

Background:

- TRS External Public Markets
- Private Equity & Hedge Funds
- Investment Banking



Courtney Villalta
Sr. Investment Manager

BS, Finance, St. Edwards

Private Equity and Real Assets

Background:

- TRS External Private Markets
- Private Equity
- Investment Banking



Grant Birdwell
Investment Manager

BS, Finance, Texas A&M

Public Markets

Background:

- TRS Tactical Asset Allocation
- Fixed Income Trading
- Institutional Advisory



Roxy Becker
Team Support



Mandates

Public Investments

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

Private Investments

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

Opportunistic Investments

- Use close external partnerships to identify **unique, dislocated and special investment** opportunities that exceed TRS return targets

Information Clearinghouse

- Use and disseminate views and positioning data from partners that **provide leverage to other groups in IMD**

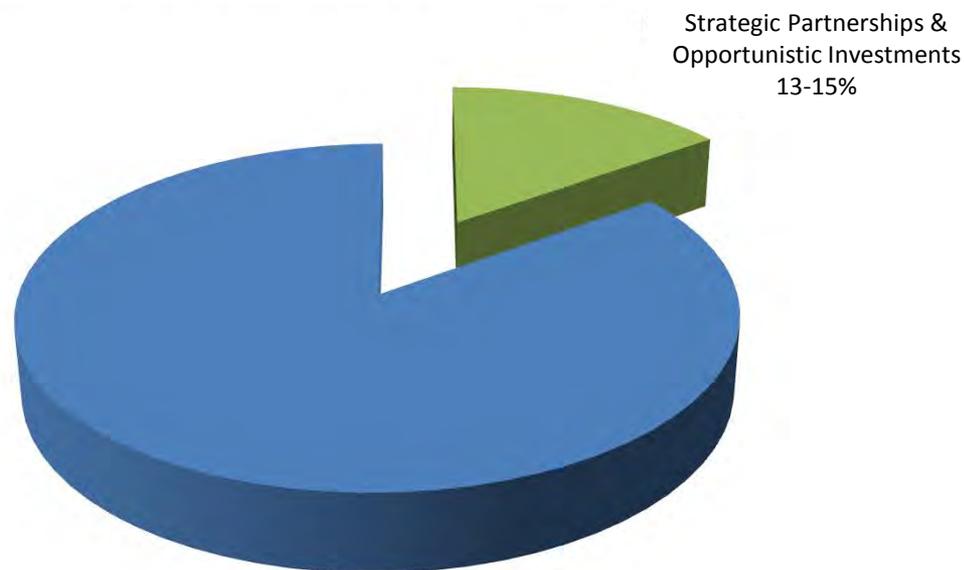
Research Center

- Work with heavily resourced partners to **customize timely investment research** to the needs of the IMD

SPO Group Organizational Update

- IMD established the Strategic Partnerships and Opportunistic Investments Group (SPO) on October 1, 2012
- Part of larger IMD plan to focus resources on areas with biggest impact
 - IMD expects SPO Group to be the **number two contributor** to Trust investment returns over the next 10 years¹

Expected Contribution to Trust Investment Returns Over 10 Years



¹The External Public Long Global Equities portfolio has the largest expected impact

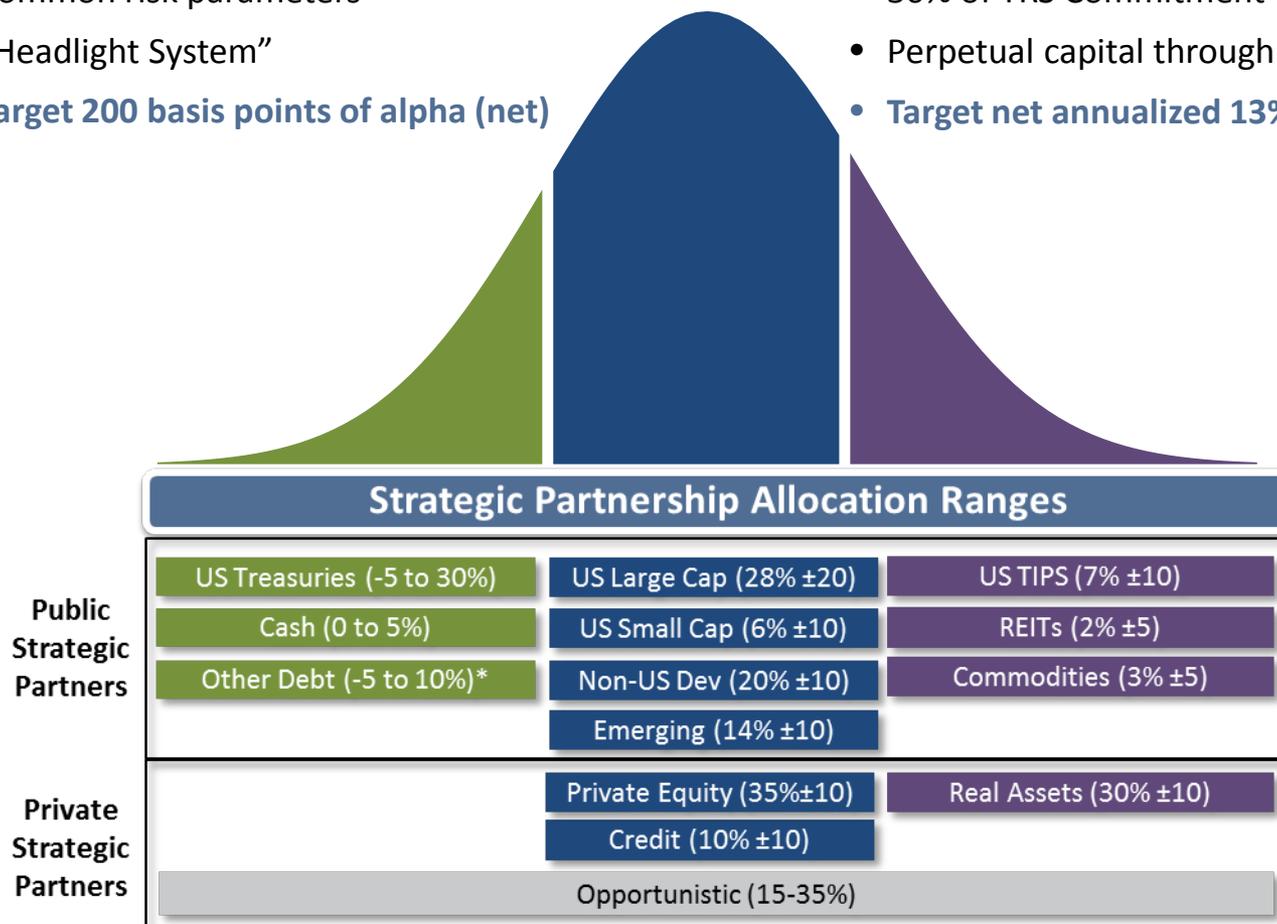
Key Features of Strategic Partnerships

Public SPN Features

- \$5.7 billion among five global firms
- Global Tactical Asset Allocation mandate
- Common risk parameters
- “Headlight System”
- **Target 200 basis points of alpha (net)**

Private SPN Features

- Two \$3 billion partnerships
- Invested over five years
- 30% of TRS Commitment to PE/RA
- Perpetual capital through Year 10
- **Target net annualized 13% return**



* Each type of other debt (EM Debt, Non-US Sovereign Debt, High Yield Debt and Structured Credit) may have a -5 to 10% weight

Public Strategic Partnership Performance

As of September 30, 2012

PUBLIC STRATEGIC PARTNERSHIP PERFORMANCE																
Program	Assets		Annualized Return %			Annualized Alpha %			Tracking Error			Information Ratio			TUCS Peer Quartile	
	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.	1-Year	3-Year
Barclays	542	0.5	20.0	N/A	6.5*	0.9	N/A	-0.9	0.7	N/A	1.3	1.3	N/A	-0.7	Top	N/A
BlackRock	1,257	1.1	17.9	9.6	5.2	-1.2	-0.6	0.6	1.5	1.6	2.1	-0.8	-0.4	0.3	Top	Top
JP Morgan	1,302	1.2	21.3	10.4	5.9	2.2	0.2	1.3	2.4	2.8	2.6	0.9	0.1	0.5	Top	Top
Morgan Stanley	1,257	1.1	21.0	10.9	5.3	1.9	0.7	0.6	1.9	1.3	1.4	1.0	0.5	0.5	Top	Top
Neuberger Berman	1,312	1.2	19.1	10.8	6.0	0.0	0.5	1.4	1.7	2.0	2.4	0.0	0.3	0.6	Top	Top
Total Public SPN	5,671	5.0	19.8	10.4	5.6	0.8	0.2	1.0	1.1	1.4	1.5	0.7	0.2	0.7	Top	Top

PUBLIC STRATEGIC PARTNERSHIP RESEARCH PROJECTS										
Program	2008	2009 1H	2009 2H	2010 1H	2010 2H	2011 1H	2011 2H	2012 1H	2012 2H	
Barclays						Risk Budgeting	Alternative Risk Premia	Risk Based Asset Allocation	Hedge Fund Alpha Persistence	Hedge Fund Risk Premia
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	
JP Morgan	Currency Hedging	Downside Risk	Inflation and GDP Regimes	Regimes and Asset Classes		Regime Change	Tail Risk	Factor Rotation	Europe Country Switching	
Morgan Stanley	Currency Hedging	Inflation Regimes	Liquidity	Sentiment	Volatility Reduction	Earnings Forecasting		Gold vs. Cash Switching	Europe Country Switching	
Neuberger Berman	Currency Hedging	Regime Analysis	Tactical Credit Allocation	Risk Based Asset Allocation		Risk Parity		Spanning Tree Analysis	Implications of Low Rates	

*Barclays inception date is June 2011; all other partners' inceptions were in July 2008
Source: State Street Bank



Public Strategic Partnership “Fearless Forecasts” for 2012

- Each year the Strategic Partners provide one-year forecasts to TRS on everything from asset class returns to economic data
- Partners expected modest positive returns for this year, flat to negative returns for Long Treasury bonds, and for TIPS to outperform Treasury bonds
 - Quantitative easing in the US and better-than-expected progress on European sovereign debt issues led to healthy returns for most financial assets

STRATEGIC PARTNER “FEARLESS FORECASTS” For 2012						
Program	<-10%	-10% to -5%	-5% to 0%	0 to 5%	5 to 10%	> 10%
US Large Cap Equity					BAR /BR / MS / NB	JP
US Small Cap Equity					BAR /BR / MS / NB	JP
EAFE Equity				BR	BAR / MS / NB	JP
Emerging Markets Equity					MS / NB	BAR / BR / JP
US Long Treasuries		NB	BAR / BR / MS	JP		
US TIPS			BR / MS	BAR / JP / NB		

Public Strategic Partnership “Fearless Forecasts” for 2013

- Strategic Partners continue to have modest expectations for investment returns for next year

STRATEGIC PARTNER “FEARLESS FORECASTS” FOR 2013 – ASSET CLASS RETURNS						
Program	<-10%	-10% to -5%	-5% to 0%	0 to 5%	5 to 10%	> 10%
US Large Cap Equity				MS	BAR / BR / JP / NB	
US Small Cap Equity				MS	BR / JP / NB	BAR
EAFE Equity				BR / JP / NB	BAR / MS	
Emerging Markets Equity				MS	BAR / BR / NB	JP
US Long Treasuries			BR / MS / NB	BAR / JP		
US TIPS			MS	BAR / BR / JP / NB		

STRATEGIC PARTNER “FEARLESS FORECASTS” FOR 2013 – ECONOMIC FORECASTS					
Program	Significantly Lower	Moderately Lower	About the Same	Moderately Higher	Significantly Higher
US Inflation			BR / JP / MS	NB	
US Unemployment		BR / JP / NB	MS		
US GDP Growth		MS	BR / NB	JP	
S&P 500 EPS Growth		MS	BAR / JP / NB	BR	
Effective Fed Funds Rate		NB	BAR / BR / JP / MS		

Private Strategic Partnership Commitments

As of September 30, 2012

PRIVATE STRATEGIC PARTNERSHIP COMMITMENTS				
(\$ in millions)	Total	Capital Committed	Capital Called	Commitment Remaining
KKR	\$3,000	\$2,100	\$373	\$1,727
Apollo	\$3,000	\$ 650	\$ 60	\$ 590
Total	\$6,000	\$2,750	\$433	\$2,317

KKR Commitments To-Date			Apollo Commitments To-Date		
(\$ in millions)	Year	Capital Committed		Year	Capital Committed
KNR Natural Resources Partnership	2011	\$750	Apollo Natural Resources Fund	2012	\$200
KKR North American Fund XI	2012	\$500	Apollo Global Real Estate – US	2012	\$150
KKR Asian Fund II	2012	\$300	Apollo Global Real Estate – Asia	2012	\$100
KKR Mezzanine Partners I	2011	\$250	Apollo European Principal Finance II	2012	\$100
KKR Special Situations Fund I	2012	\$200	Apollo India Credit Fund	2012	\$100
Global Infrastructure Fund	2012	\$100			
Total		\$2,100	Total		\$650

EXPECTED PRIVATE STRATEGIC PARTNERSHIP COMMITMENT SCHEDULE							
(\$ in millions)	2011	2012	2013	2014	2015	2016	Total
KKR	\$1,000	\$1,100	\$550	\$150	\$200	-	\$3,000
Apollo	-	\$1,125	\$1,025	\$175	\$575	\$100	\$3,000
Total	\$1,000	\$2,225	\$1,575	\$325	\$775	\$100	\$6,000

Other Strategic Partnership Initiatives

1. Strategic Partnership Exchange/Training

- IMD professionals work alongside Strategic Partners for up to three months
- Co-developed with IMD Professional Development Group
- Four TRS Investment Professionals participated in 2012



Ashley Baum

Grant Birdwell

Jon Hook

Ross Willmann

2. Research

- Two value-add research projects per calendar year from each partner
- Research based on IMD needs and Partner expertise

3. Strategic Partner Summits

- Held three times per year (once in New York, twice in Texas)
- Discuss and debate topical investment themes
- First joint Public/Private Summit in 2013

Opportunistic Investment Evaluation

- Organize evaluation of and response to dislocated markets
 - Example: European bank distress, 2007/2008 credit dislocation
- Pursue investments with strong return potential (i.e. greater than 10%), but imperfect fit with current investment units
 - Example: Credit opportunities or private deals with mid-teens returns that might involve multiple areas of capital structure
- Coordinate with Private SPN on generation of attractive “one-off” investments

2013 Priorities (Preliminary)

#	Priority	Objective
1	Fully Implement New Investment Unit	<ul style="list-style-type: none"> • Codify core investment, monitoring and reporting process • Integrate private and public markets processes
2	Integrate Public and Private Strategic Partnerships	<ul style="list-style-type: none"> • Joint summit to discuss full spectrum of opportunities • Unified performance reporting and opportunity assessment
3	Expand Information Exchange with SPN (Common Language Project)	<ul style="list-style-type: none"> • Create unified framework to measure external partner risk • Facilitate better flow of information by unifying language
4	Expand Exchange with IMD Units	<ul style="list-style-type: none"> • Improve IMD access to strategic partner resources • Align reports and opportunity assessment with other units
5	Launch Sponsored Research	<ul style="list-style-type: none"> • Improve and expand use of partner research in IMD • Match projects with sponsors around IMD
6	Develop Opportunistic Mandate	<ul style="list-style-type: none"> • Formalize process for sourcing, evaluating and investing in one-off opportunities that leverage our Network