



# INVESTMENT MANAGEMENT COMMITTEE



**APRIL 2013**

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**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**

**April 18, 2013 – 9:00 a.m.  
TRS East Building, 5<sup>th</sup> Floor Boardroom**

1. Consider the approval of the proposed minutes of the December 13, 2012 committee meeting – Todd Barth.
2. Receive a review of Internal Public Markets – Chi Chai, Janis Hydak, and Shayne McGuire.
3. Receive a review of the Trading Management Group – Bernie Bozzelli.

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 a quorum of the Board may attend the Committee meeting, the meeting of the Committee is also being posted as a meeting of the Board out of an abundance of caution.

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## Minutes of the Investment Management Committee

December 13, 2012

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on December 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 by telephone conference  
Eric McDonald  
Nanette Sissney

A quorum of the committee was present. Others present:

Karen Charleston, TRS Trustee	Dennis Gold, TRS
Charlotte Clifton, TRS Trustee	Rebecca Merrill, TRS
Chris Moss, TRS Trustee	Mary Chang, TRS
Anita Palmer, TRS Trustee	Noel Sherman, TRS
Brian Guthrie, TRS	Hugh Ohn, TRS
Britt Harris, TRS	Brian Gomolski, TRS
Ken Welch, TRS	Lynn Lau, TRS
Jerry Albright, TRS	Kyle Weigum, TRS
Amy Barrett, TRS	Dan Herron, TRS
Jase Auby, TRS	Philip Mullins
Curt Rogers, TRS	Dr. Keith Brown, Investment Advisor
Rusty Guinn, TRS	Steven Huff, Fiduciary Counsel
Dale West, TRS	Brady O'Connell, Hewitt EnnisKnupp
Janis Hydak, TRS	Steve Voss, Hewitt EnnisKnupp
Eric Lang, TRS	Jim Bauer, Unite Here
James Nield, TRS	Tathata Lohachitkul, Albourne America
Mike Simmons, TRS?	Ann Fickel, Texas Classroom Teachers Association
Mark Telschow, TRS	Ted Melina Raab, Texas American Federation of Teachers
Roxy Becker, TRS	Leroy DeHaven, Texas Retired Teachers Association
David Veal, TRS	Craig teDuits, State Street
Tommy Albright, TRS	Jeff Lambert, State Street
Courtney Villalta, TRS	Owen Davies, Accenture
Sharon Toalson, TRS	Sanjay Menon, Accenture
Scot Leith, TRS	Josh Sanderson, Accenture
Terry Harris, TRS	

Mr. Todd Barth called the meeting to order at 8:17 a.m.

Mr. David Kelly participated in the committee meeting by telephone conference call pursuant to section 551.130 of the Texas Open Meetings Act (chapter 551 of the Texas Government Code), concerning participation by a TRS board member in a public meeting by telephone conference call.

Per Mr. Barth's request, all committee members and staff sitting at the committee table identified themselves, in accordance with the protocol for telephone conferencing.

**1. Consider the approval of the proposed minutes of the September 13, 2012 committee meeting – Todd Barth.**

On a motion by Ms. Nanette Sissney, seconded by Mr. Eric McDonald, the committee approved the minutes of the September 13, 2012 meeting as presented.

**2. Review Strategic Asset Allocation/Stable Value, Tactical Asset Allocation, Risk, and Strategic Partnerships and Opportunistic Investments.**

Mr. Britt Harris provided an overview of the following teams: Strategic Asset Allocation/Stable Value (SAA) led by Mohan Balachandran, Tactical Asset Allocation (TAA) by Curt Rogers, Risk Management by Jase Auby, and Strategic Partnerships and Opportunistic Investments (SPO) Group by Rusty Guinn.

Mr. Rogers provided an overview of the SAA Group. He laid out the organizational structure and mandate of the group. Mr. Harris clarified for Dr. Keith Brown when the credit spread would be managed internally or externally. Mr. Rogers noted that the SAA/Stable Value Portfolio had a narrow tracking error range. He also presented the outlook of the portfolio over the intermediate and long terms. Mr. Kelly asked staff to conduct a study on the probability of realizing different return assumptions. Mr. Auby provided an update on the hedge fund replication strategy and the enhanced commodity alpha strategy. He also provided an overview of the 2013 priorities of the group.

Mr. Rogers profiled the TAA group, including its organization, mandate, process, and 2013 priorities. Mr. Rogers confirmed for Mr. Joe Colonna that staff always complied with the asset allocation before executing a tactical move. Responding to a question from Mr. Kelly regarding the monitoring of derivatives usage, Mr. Rogers stated that the TAA group, Investment Operations, the Investment Risk Group, and Internal Audit monitored it. Mr. Harris noted that TRS' custodian bank, State Street Bank and Trust Company, and TRS' Compliance Officer, Terry Harris, also monitored the use of derivatives. Mr. Auby noted that the Risk Group was independent of the TAA and SAA groups in its monitoring function.

Mr. Auby provided an overview of the Risk Group. He laid out the group's portfolio management and risk monitoring functions. He presented the group's organizational structure and key risk signals. He explained for Mr. McDonald that the absolute return in the last seven years, the Z score, and the change of correlations would determine if there is a potential bubble. He further explained the bubble monitoring and the cumulative sum (CUSUM) processes. Responding to a question from Mr. Colonna on the discrepancy in the performance of the REITS before and after the CUSUM signals, Mr. Auby stated that the price movement would affect the accuracy of the signals. He presented the group's 2012 accomplishments and 2013 priorities. Concerning the contingent hedging program, Dr. Brown and Mr. Kelly discussed whether the program should be considered as a self-insurance tool or an investment decision.

Mr. Guinn provided an update of the SPO Group. He presented the group's organizational structure, mandate, and 2013 goals. He profiled the current strategic partners on the public side: Barclays, BlackRock, JP Morgan, Morgan Stanley, and Neuberger Berman. He also reviewed

their processes and performance. He explained for Dr. Brown the process of re-evaluating a partner's capabilities in different areas. Mr. Guinn also profiled the partnerships with KKR and Apollo on the private market side. Mr. Kelly and Mr. Guinn discussed the allocations and commitments to KKR and Apollo as strategic partners in contrast to their roles in managing individual private investment funds before the creation of the strategic partner network. Mr. Kelly asked staff to clarify up to what level of allocation staff needs to come to the board for approval. Mr. Guinn stated that he would deliver the answer to Mr. Kelly's question after reviewing the data and policy requirements in detail.

Following up on an earlier question from Dr. Brown, Mr. Harris elaborated on Mr. Auby's presentation by reviewing the accomplishments of the Risk Group. The goal, he said, was to allow the Risk Group to be more involved in decision making by integrating their efforts with other investment groups. Mr. Harris also confirmed for Mr. Barth that the SAA, TAA, Risk, and SPO groups added about \$450 million in total value in 2011 and an estimated \$400 to \$500 million in 2012.

The meeting adjourned at 10:37 a.m.



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# Internal Active Equity Portfolio Management

Chi Kit Chai

Senior Managing Director

April 2013

# Overview

## Overview

- TRS IMD Internal Management

## Internal Actively Managed Equity Portfolios

- TRS Investment Division
- Internal Active Portfolios
- Active Equity Management Unit

## Market Update

- Regional Returns Update
- Sector Returns Update
- Correlation Update

## GBI Flagship

- Investment Results
- Competitive Landscape
- Performance Attribution
- Region and Sector Positioning

## GBI Core

- Fundamental Characteristics
- Investment Process
- Security Selection
- Top Holdings and Overweights

## GBI Quant

- Diversification Benefits
- Investment Results
- Investment Process

## GBI US High Quality

- Investment Results
- Rationale

## GBI Gold

- Investment Results
- Rationale

## Accomplishments, Priorities and Collaboration

### IPM 2017 and Trust-wide Initiatives

- Internal Active Timeline
- IPM 2017

## Summary

## Appendix

# TRS IMD Internal Management

## Overview

Internal Management	
<ul style="list-style-type: none"> <li>• \$43 billion managed internally (38% of TRS Portfolio)</li> <li>• 4th largest actively managed global equity fund</li> <li>• \$21 billion managed actively</li> <li>• \$22 billion managed passively</li> </ul>	<ul style="list-style-type: none"> <li>• Experienced investment and trading teams</li> <li>• Well developed investment processes with effective risk management</li> <li>• Annual implied cost savings: \$120 million</li> </ul>

Active Portfolios (managed by Internal Public Markets Team)							
Global Best Ideas (GBI)	AUM (\$M)	ALPHA				Tracking	Information
		1 Yr	3 Yrs	5 Yrs	ITD	Error	Ratio
Core	\$ 19,810	0.7%	0.3%	0.5%	0.6%	1.4%	0.39
Quant	\$ 547	2.5%	0.9%	-	2.1%	2.1%	1.01
Flagship	\$ 20,358	0.7%	0.3%	0.5%	0.6%	1.4%	0.43
Gold	\$ 816	2.3%	1.9%	-	1.8%	2.1%	0.86
US High Quality	\$ 99	1.2%	-	-	0.1%	4.6%	0.02
Total Internal Active	\$ 21,273						

GBI Flagship Portfolio Characteristics		GBI Flagship Factor Exposures	
Characteristics	Data	Factor	% of Risk
Predicted Beta	1.0	Stock Specific	45
Price/Earnings - Trailing	13.5x	Region/Currency	24
Price/Earnings - Forward	12.6x	Volatility	13
Price/Book	1.7x	Sector	10
Dividend Yield	2.7%	Momentum	7
ROE	18.0%	Growth	1
EPS Growth	11.3%	Value	0
Debt/Capital	31.5%	Size	0
Realized Tracking Error	140 bps	Total Factor Exposures	100%

GBI Flagship Key Policies			
<b>Benchmark:</b> MSCI All-Country World		<b>Target Alpha:</b> 50 basis points	
<b>Regions</b>	<b>BM Weight</b>	<b>Risk Ranges</b>	
United States	46%	- <b>Tracking Error:</b> 0 to 200 basis points	
Europe	24%	- <b>Regional Allocation:</b> -3% to +3%	
Asia Ex Japan	10%	- <b>Sector Allocation:</b> -3% to +3%	
Japan	7%		
Latin America & EMEA	5%	<b>Research Portfolios (Unfunded)</b>	
Other	8%	US REIT Long/Short	
	100%		

Passive Portfolios (managed by Stable Value and Risk Teams)			
Passive Portfolios	AUM (\$M)	Research Portfolios (Funded)	AUM (\$M)
Long-Term Treasury Bonds	\$ 12,869	Qualitative Vector Fund (QVF)*	\$ 100
Treasury Inflation-Protected Securities (TIPS)	\$ 5,723	Commodity Alpha Fund*	\$ 100
Hedge Fund Replication	\$ 1,240	Low Volatility with Overlay**	\$ 101
Equity	\$ 2,593	Total Research (Funded)	\$ 301
Total Passive	\$ 22,423		
<b>Other Internal</b>		<b>Research Portfolios (Unfunded)</b>	
Classic Tactical Allocation	Total Trust Overlay	Risk Parity	



\*Notional exposure  
\*\*Co-managed with IPM

# INTERNAL ACTIVELY MANAGED EQUITY PORTFOLIOS

# TRS Investment Management Division



**Britt Harris**  
CIO



**Jerry Albright**  
Deputy CIO

**Stable Value**

**Global Equity**

**Real Return**

**OPERATIONS**  
Sylvia Bell



**STABLE VALUE**  
Mohan Balachandran/  
Bernie Bozzelli

**EXTERNAL PUBLIC**  
Dale West



**PRIVATE EQUITY**  
Rich Hall



**INTERNAL PUBLIC**  
Chi Chai



**REAL ASSETS**  
Eric Lang



**RISK**  
Jase Auby



**TAA**  
Curt Rogers



**NATURAL RESOURCES**  
Vaughn Brock



**TRADING**  
Bernie Bozzelli



**PASSIVE REPLICATION RISK PREMIUM**  
Mohan Balachandran

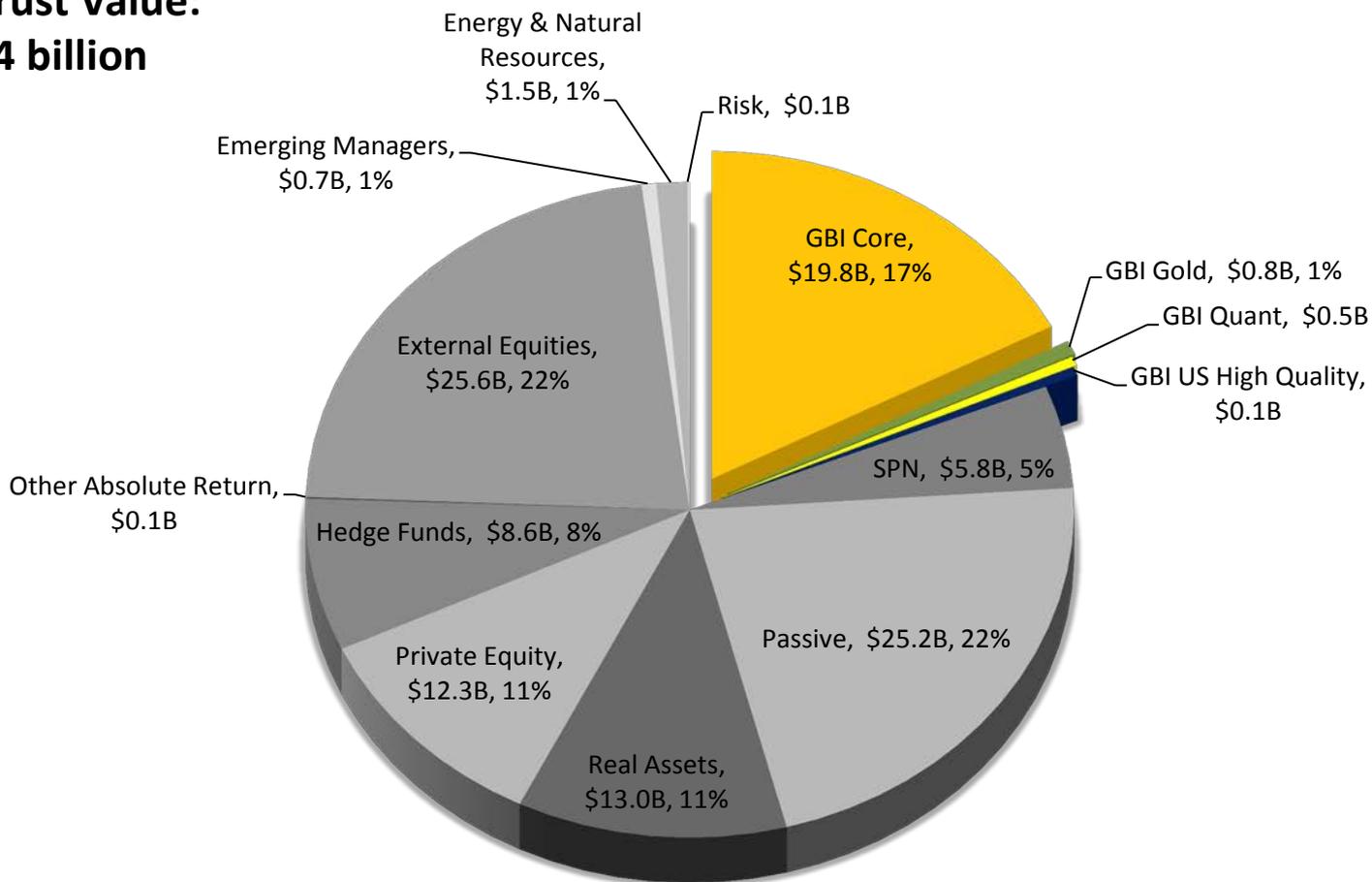


**STRATEGIC PARTNER NETWORK**  
*Public and Private*  
TBD

# Internal Public Markets

*Investment Management Division as of December 31, 2012*

**Total Trust Value:  
\$114 billion**



# Internal Public Markets

## IPM Management Committee



**Chi Kit Chai, CFA**  
**Head of Internal Public Markets**

*BA Virginia Tech, MBA SMU, MA UT  
Joined TRS in 1996*



**Janis Hydak, CFA**  
**Head of Quant Research**

*BA Duke, MAT Wesleyan, MA  
Middlebury College, JD Alabama,  
MBA St. Edward's  
Joined TRS in 1985*



**Shayne McGuire**  
**Head of Fundamental Research**

*BA Fordham, MA & MBA UT  
Joined TRS in 2001*



**David DeStefano, CFA**  
**Head of Portfolio  
Management**

*BBA & MBA UT  
Joined TRS in 2001*



**Mark Albert, CFA**  
**Quant Portfolio Manager**

*BA Brandeis, MBA Michigan  
Joined TRS in 1999*



**Patrick Cosgrove, CFA**  
**EAFE Portfolio Manager**

*BA Texas A&M, MBA St. Mary's  
Joined TRS in 1999*

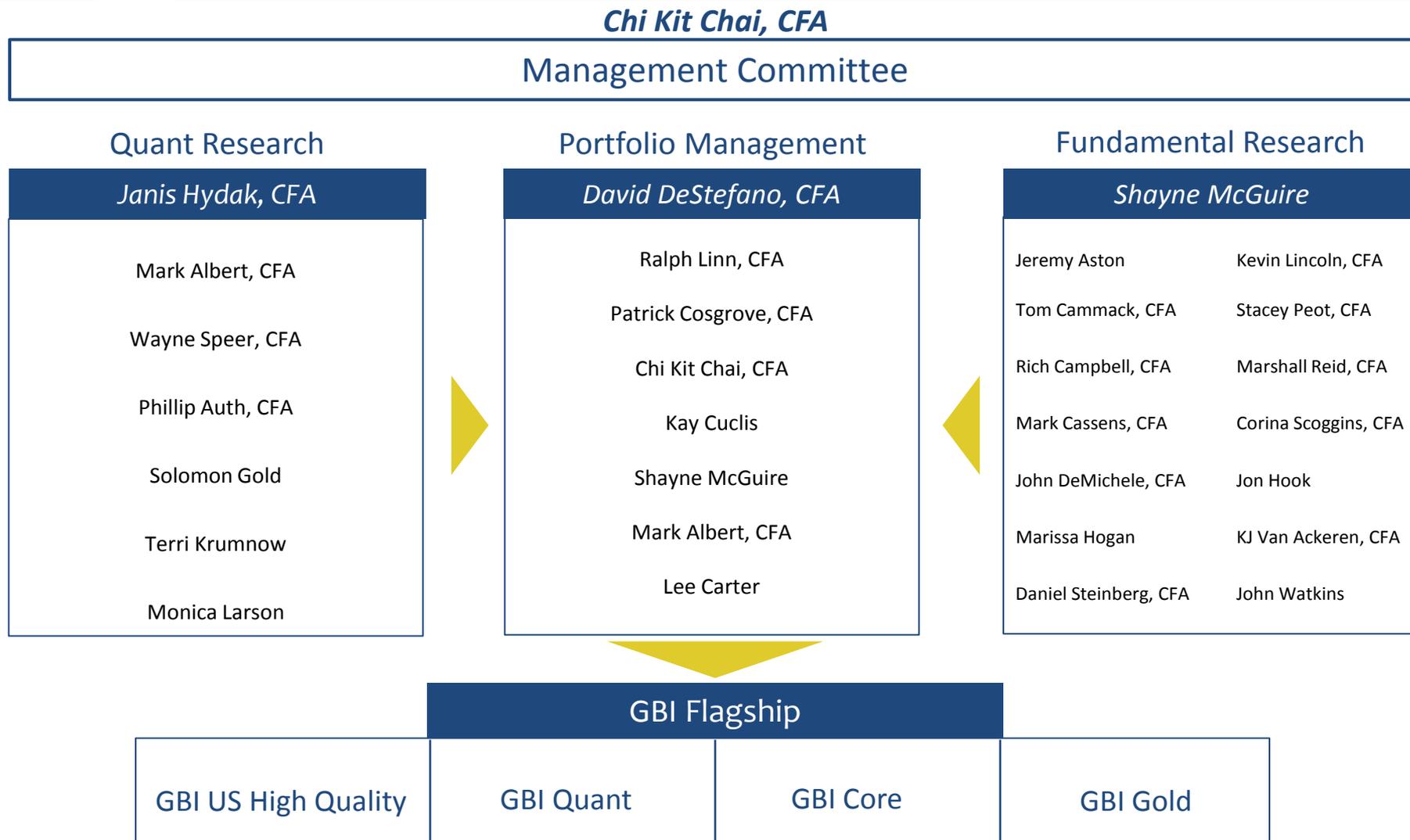


**Ralph Linn, CFA**  
**US Portfolio Manager**

*BS, MBA & JD Tulane  
Joined TRS in 2002*

# Internal Public Markets

## Organizational Chart



- 18 CFA Charterholders
- 15 Average Years of Experience
- 32 MBAs/Other Graduate Degrees

# Global Regional Returns

Rank	Annual						Annualized	
	2012	2011	2010	2009	2008	2007	3 Year	5 Year
1	Asia Ex JP 22%	United States 1%	Canada 20%	EMEA & LA 85%	Japan -29%	Asia Ex JP 40%	United States 10%	Australia 2%
2	Australia 22%	MSCI -7%	Asia Ex JP 20%	Australia 76%	United States -38%	EMEA & LA 37%	Australia 8%	United States 1%
3	Europe 19%	Australia -11%	EMEA & LA 19%	Asia Ex JP 72%	MSCI -42%	Canada 30%	MSCI 7%	Asia Ex JP 0%
4	MSCI 16%	Europe -11%	Japan 15%	Canada 56%	Canada -46%	Australia 28%	Asia Ex JP 7%	Canada 0%
5	United States 15%	Canada -13%	United States 15%	Europe 36%	Europe -46%	Europe 14%	Canada 5%	MSCI -1%
6	EMEA & LA 14%	Japan -14%	Australia 15%	MSCI 35%	Australia -51%	MSCI 12%	Europe 3%	EMEA & LA -1%
7	Canada 9%	Asia Ex JP -17%	MSCI 13%	United States 26%	Asia Ex JP -52%	United States 5%	EMEA & LA 3%	Japan -4%
8	Japan 8%	EMEA & LA -20%	Europe 4%	Japan 6%	EMEA & LA -54%	Japan -4%	Japan 2%	Europe -4%

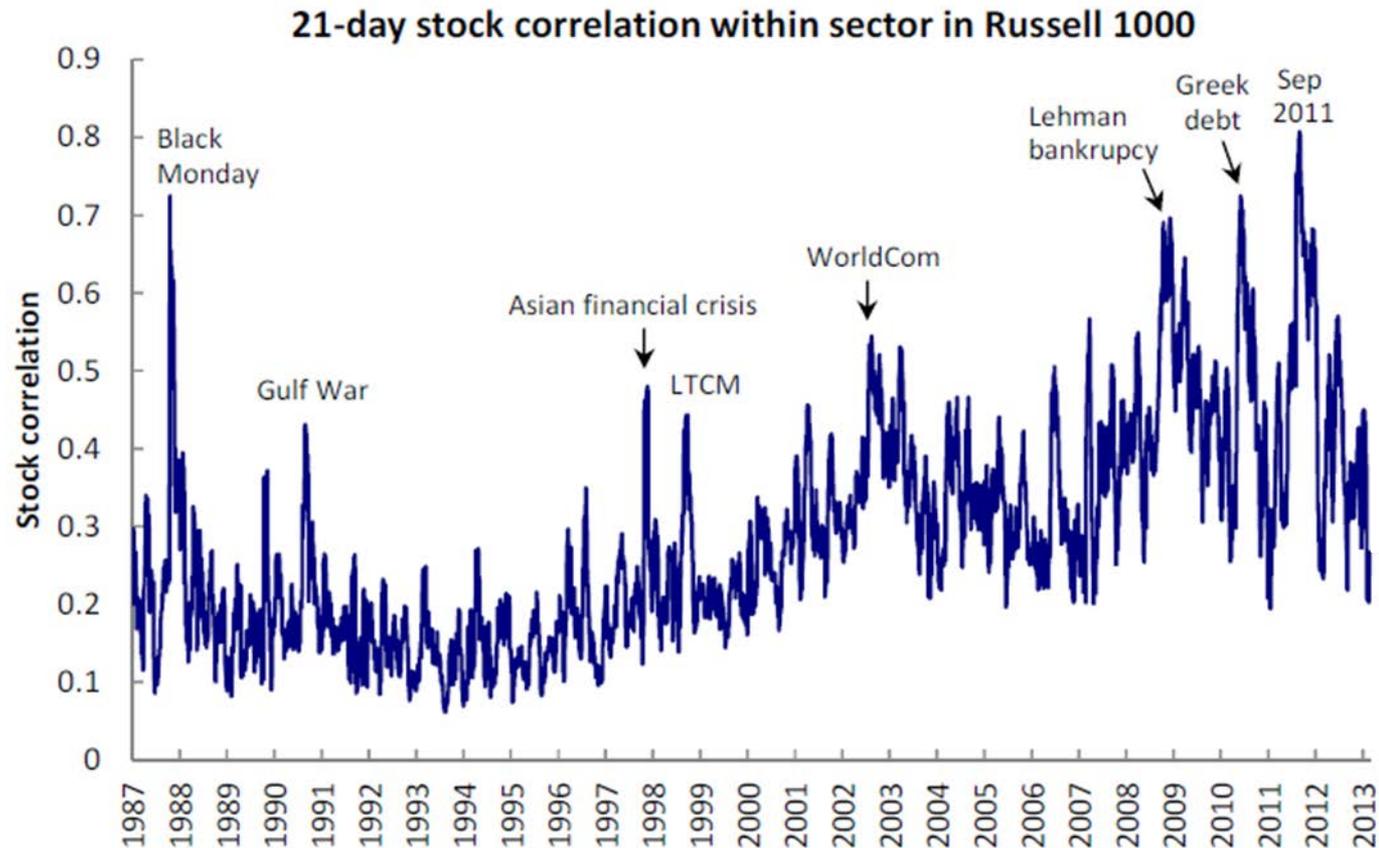
# Global Sector Returns

Rank	Annual						Annualized	
	2012	2011	2010	2009	2008	2007	3 Year	5 Year
1	Financials 29%	Health Care 9%	Discretionary 25%	Materials 70%	Health Care -21%	Materials 38%	Discretionary 14%	Staples 6%
2	Discretionary 23%	Staples 8%	Industrials 24%	Technology 58%	Staples -24%	Energy 34%	Staples 12%	Health Care 4%
3	Health Care 18%	Telecom 0%	Materials 22%	Discretionary 44%	Utilities -30%	Telecom 27%	Health Care 10%	Discretionary 4%
4	MSCI 16%	Energy -3%	Staples 14%	Financials 37%	Telecom -36%	Utilities 23%	Industrials 9%	Technology 1%
5	Industrials 16%	Technology -4%	MSCI 13%	MSCI 35%	MSCI -42%	Staples 19%	Technology 7%	MSCI -1%
6	Technology 15%	Utilities -5%	Energy 12%	Energy 33%	Energy -42%	Industrials 19%	MSCI 7%	Industrials -2%
7	Staples 15%	Discretionary -5%	Technology 11%	Industrials 29%	Discretionary -42%	Technology 14%	Telecom 6%	Telecom -2%
8	Materials 11%	MSCI -7%	Telecom 11%	Staples 24%	Technology -45%	MSCI 12%	Energy 3%	Materials -3%
9	Telecom 8%	Industrials -10%	Financials 6%	Health Care 19%	Industrials -45%	Health Care 4%	Financials 3%	Energy -3%
10	Energy 2%	Financials -19%	Health Care 3%	Telecom 16%	Materials -52%	Discretionary -2%	Materials 2%	Utilities -6%
11	Utilities 2%	Materials -21%	Utilities 0%	Utilities 10%	Financials -54%	Financials -5%	Utilities -1%	Financials -7%



Source: MSCI

# Correlations Are Down



**Note:** Shows 21-day stock correlation within sector, where the averages of all pair-wise stock correlations are calculated within GICS 10 sectors in Russell 1000 universe using 21-day total returns and these correlations are averaged over all GICS 10 sectors. Period of analysis is from 2 January 1987 through 22 February 2013.

# GBI FLAGSHIP

# GBI Flagship (Core Plus Quant)

Performance as of December 31, 2012

Year	AUM (\$ in billions)	Investment Return (%)	Alpha (bps)
2012	\$20.4	16.8	65
2011	\$18.2	-7.3	7
2010	\$19.4	12.8	16
2009	\$16.7	35.4	77
2008	\$12.1	-41.5	72
2007*	\$3.9	2.8	43

Annualized	Investment Return (%)	Alpha (bps)	Risk Metrics		Peer Quartile Rank
			Tracking Error	Information Ratio	Information Ratio
1-Year	16.8	65	0.6%	1.1	1
3-Year	6.9	28	0.9%	0.3	2
5-Year	-0.7	51	1.4%	0.4	2
Since Inception*	-0.1	60	1.4%	0.4	2

**Notes**

Benchmark is MSCI All Country World

\*Inception: GBI Flagship: December 2007

Peer universe is eVestments funds. EVestments peer performance is based on gross returns. Fees are not subtracted.

Tracking Error: annualized standard deviation of monthly excess returns

Information Ratio: annualized excess returns/tracking error



# GBI Core and GBI Quant

Performance as of December 31, 2012

## GBI CORE

Year	AUM (\$ in billions)	Investment Return (%)	Alpha (bps)
2012	\$19.8	16.8	66
2011	\$17.6	-7.1	23
2010	\$19.0	12.8	9
2009	\$16.4	35.3	67
2008	\$12.1	-41.6	59
2007*	\$3.9	2.8	37

## GBI QUANT

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2012	\$547	18.6	245
2011	\$250	-8.4	-101
2010	\$182	14.2	158
2009*	\$170	28.3	502

### Notes

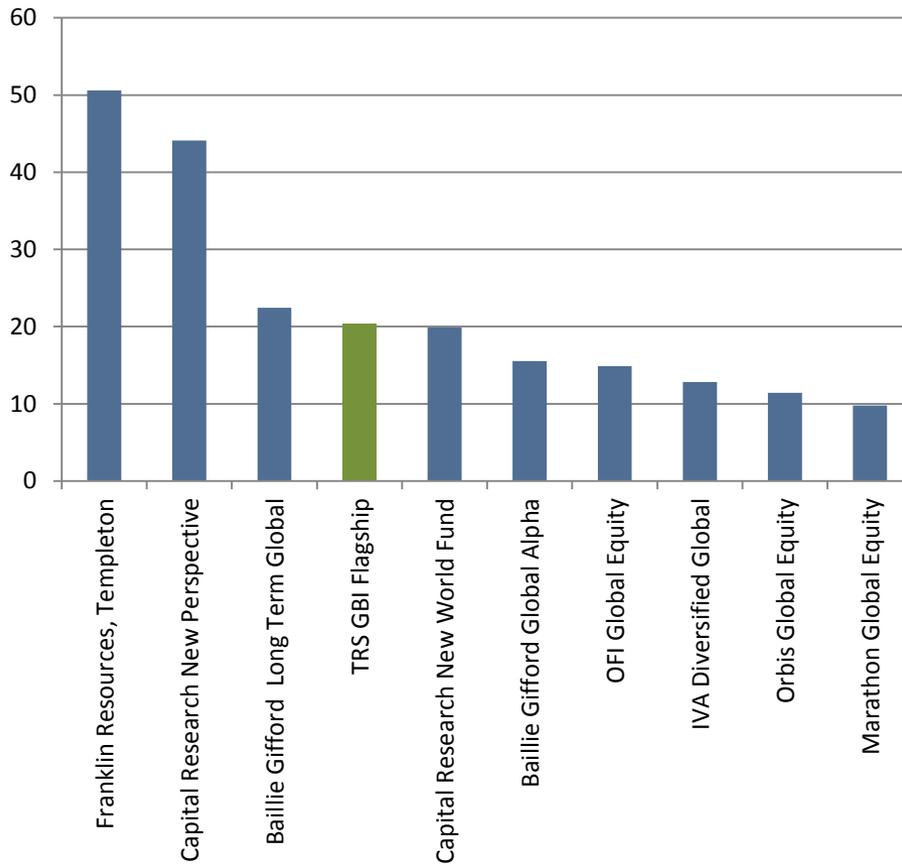
Benchmark is MSCI All Country World

\*Inception: GBI Core: December 2007; GBI Quant: June 2009

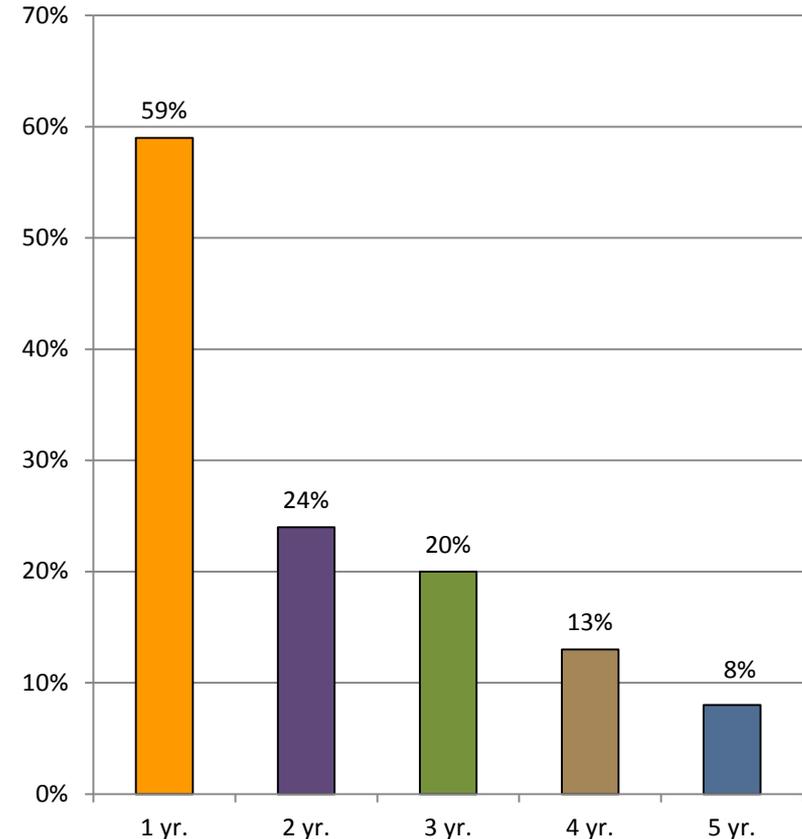


# GBI Flagship Competitive Landscape

Ten Largest Actively Managed Global Funds, AUM (\$ in billions)



Percentage of Funds Beating Benchmark in Consecutive Years



**4<sup>th</sup> Largest Global Fund**

**Only 8% have 5 Years of Consecutive Alpha**



Source: eVestments

# GBI Flagship Attribution

## Performance and Risk

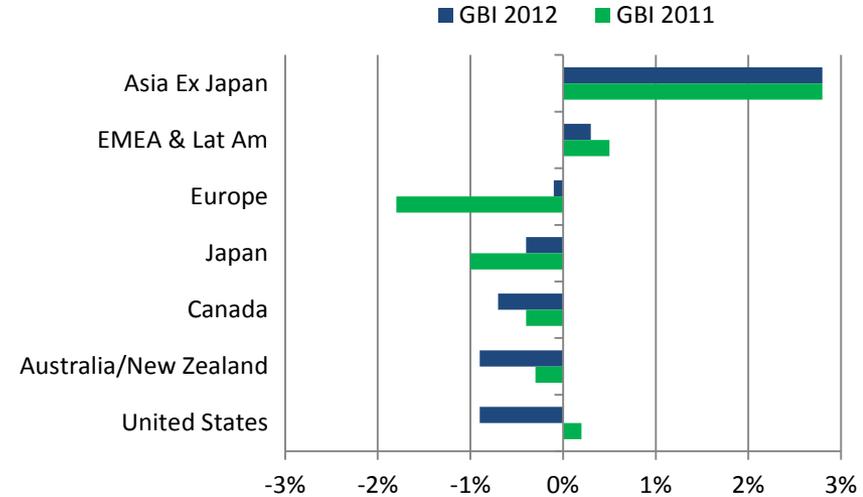
### GBI Relative Performance and Risk

	2012	2011	2010	2009	2008	2007	Cumulative	Annualized	
								3-Year	ITD
<b>Attribution (bps) – Alpha</b>									
Stock	33	(7)	(10)	27	6	41	113	12	23
Region	37	5	21	49	17	1	152	16	31
Sector	(5)	9	5	1	49	1	30	0	6
<b>Total</b>	<b>65</b>	<b>7</b>	<b>16</b>	<b>77</b>	<b>72</b>	<b>43</b>	<b>295</b>	<b>28</b>	<b>60</b>
<b>Risk Factors (%)</b>									
Stock Specific	46%	33%	32%	49%	53%	52%	43%	37%	43%
Region / Currency	31%	34%	34%	14%	5%	7%	24%	33%	24%
Sector	11%	21%	14%	12%	9%	5%	14%	15%	14%
Volatility	4%	7%	12%	7%	2%	7%	6%	8%	6%
Momentum	7%	4%	5%	13%	22%	13%	10%	5%	10%
Growth	1%	0%	2%	3%	2%	3%	2%	1%	2%
Value	-1%	0%	0%	0%	3%	6%	1%	0%	1%
Size	0%	0%	0%	0%	1%	0%	0%	0%	0%
Leverage	1%	0%	0%	2%	3%	5%	1%	1%	1%
Liquidity	1%	0%	1%	0%	0%	1%	0%	1%	0%
<b>Total</b>	<b>100%</b>								

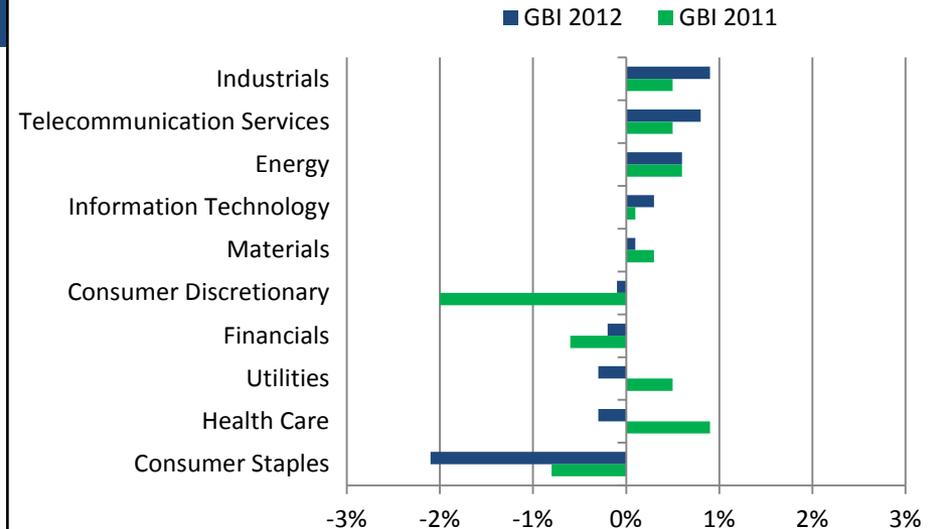
# GBI Flagship

## Positioning

Regions	GBI		Over/Under	
	2012	2011	2012	2011
Asia Ex Japan	12.6%	11.9%	2.8%	2.8%
EMEA & Lat Am	5.7%	5.9%	0.3%	0.5%
Europe	24.1%	22.0%	-0.1%	-1.8%
Japan	7.0%	7.0%	-0.4%	-1.0%
Canada	3.5%	4.1%	-0.7%	-0.4%
Australia/New Zealand	2.5%	2.9%	-0.9%	-0.3%
United States	44.7%	46.2%	-0.9%	0.2%



Sectors	GBI		Over/Under	
	2012	2011	2012	2011
Industrials	11.3%	11.0%	0.9%	0.5%
Telecommunication Svcs.	5.1%	5.4%	0.8%	0.5%
Energy	11.2%	12.7%	0.6%	0.6%
Information Technology	12.4%	12.3%	0.3%	0.1%
Materials	7.7%	8.3%	0.1%	0.3%
Consumer Discretionary	10.6%	8.0%	-0.1%	-2.0%
Financials	21.0%	17.9%	-0.2%	-0.6%
Utilities	3.2%	4.4%	-0.3%	0.5%
Health Care	9.0%	10.2%	-0.3%	0.9%
Consumer Staples	8.3%	9.9%	-2.1%	-0.8%



# GBI Core

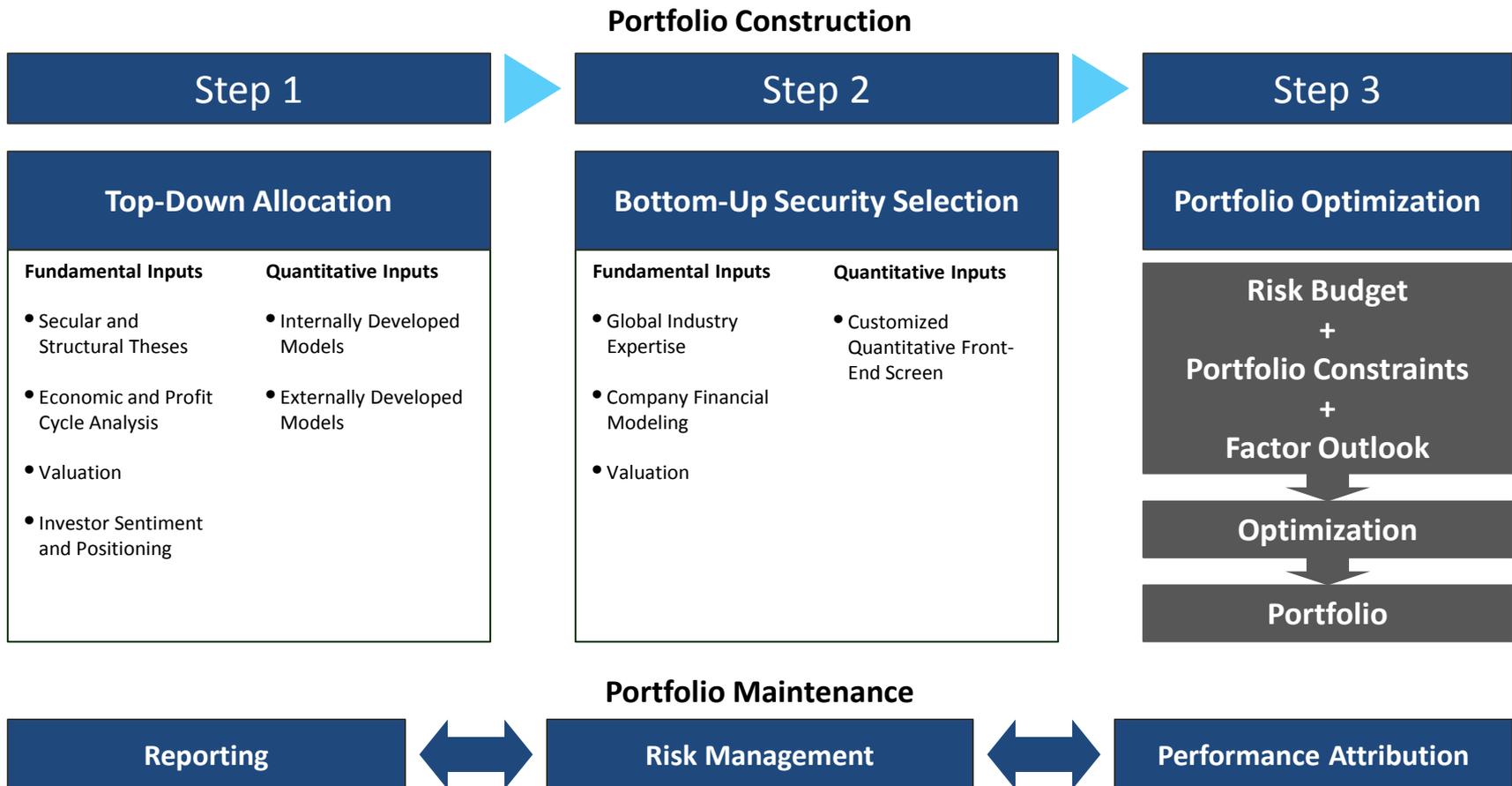
*Portfolio Characteristics as of December 31, 2012*

	Portfolio Characteristics	GBI Core		MSCI ACWI	
		2012	2011	2012	2011
<b>Valuation Metrics</b>	Market Capitalization	\$77.3B	\$68.6B	\$74.9B	\$64.8B
	Price/Earnings – Trailing	13.5x	11.8x	13.9x	12.1x
	Price/Earnings – Forward	12.6x	11.0x	13.1x	11.4x
	Price/Book	1.7x	2.0x	1.7x	2.0x
	Dividend Yield	2.7%	2.6%	2.8%	2.4%
<b>Quality Metrics</b>	Estimated 3-5 Year EPS Growth	11.3%	10.7%	10.6%	10.7%
	Return on Equity	18.0%	18.8%	17.6%	18.6%
	Long-Term Debt/Capital	31.5%	30.3%	32.6%	31.2%
<b>Risk Metrics</b>	Beta	1.0	1.0	1.0	1.0

# GBI Core

## Investment Process

- Top-down allocation and bottom-up security selection
- Quantitative screen, fundamental analysis, and portfolio optimization



# GBI Core

## Bottom-Up Security Selection

### Investable Universe

- MSCI All-Country Index
- Non-Index Names

2,500+

### Quant-Screened Universe

- Customized Proprietary Screen
- Dynamic Factor Model
- 8 – 10 Diversified Factor Groupings

1,500

### Fundamental Research List

- Liquidity
- Industry Dynamics
- Valuation

450

### High Conviction Stocks

- High Conviction Overweights
- Roughly 40% of the Portfolio

150

#### Optimized Portfolio

High  
Conviction  
150

Risk  
Control  
650

# GBI Core

## Top Ten Holdings as of December 31, 2012

Company	Market Value (\$ in millions)	GBI (%)	Benchmark (%)	Difference
Apple	362.7	1.8	1.7	0.1
Exxon Mobil	228.0	1.2	1.4	-0.2
Microsoft	172.2	0.9	0.7	0.2
Chevron	169.5	0.9	0.7	0.2
Royal Dutch Shell	162.2	0.8	0.8	0.1
Samsung Electronics	160.5	0.8	0.6	0.2
Pfizer	158.7	0.8	0.6	0.2
Nestle	153.5	0.8	0.7	0.1
AT&T	150.2	0.8	0.7	0.0
Philip Morris International	147.1	0.7	0.5	0.2
<b>Total</b>	<b>\$1,864.6</b>	<b>9.5</b>	<b>8.4</b>	<b>1.1</b>

# GBI Core

## Top Overweights and Underweights as of December 31, 2012

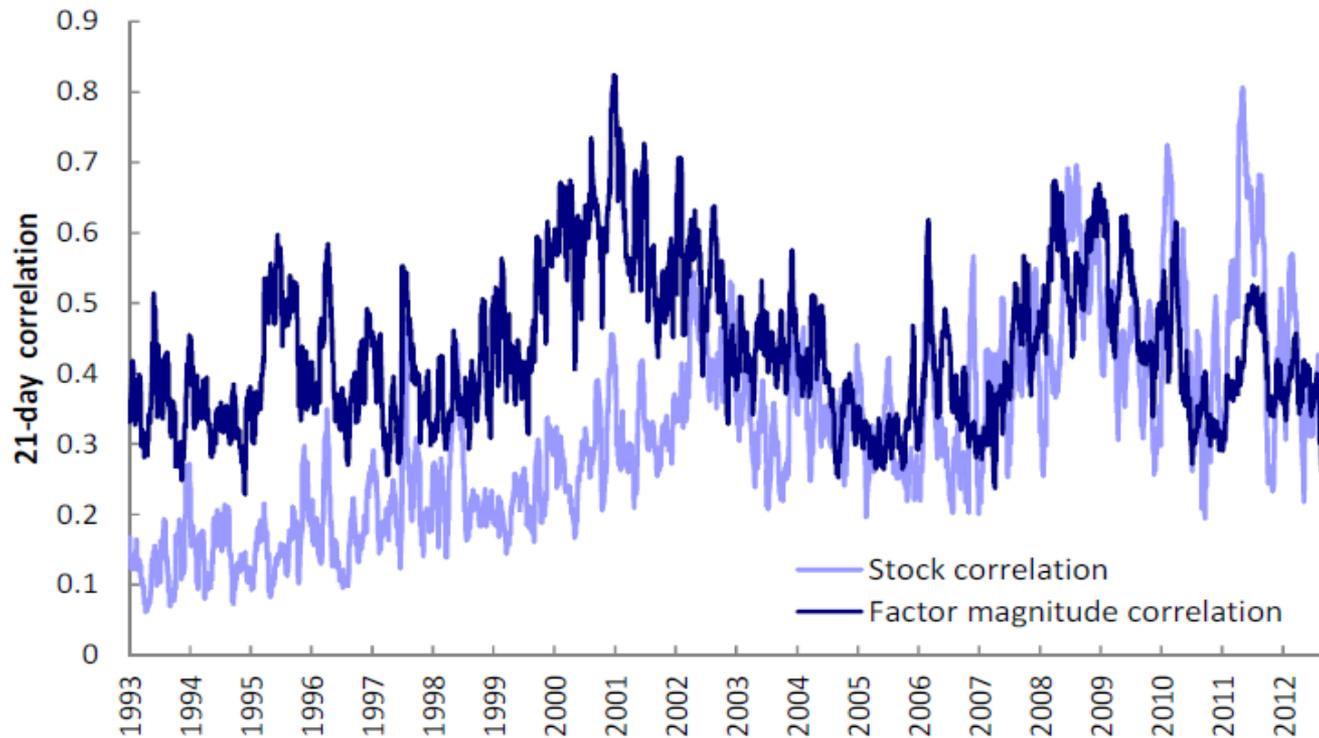
Overweights			Underweights		
Company	Market Value (\$ in millions)	Overweight (%)	Company	Market Value (\$ in millions)	Underweight (%)
ACE	94.0	0.4	Siemens	0.0	-0.3
LyondellBasell Industries	80.7	0.3	Bank of America	35.7	-0.2
iShares FTSE A50 China Index ETF	66.6	0.3	ConocoPhillips	0.0	-0.2
China Construction Bank	105.4	0.3	U.S. Bancorp	0.0	-0.2
Valeo	59.4	0.3	ExxonMobil	228.0	-0.2
Ameriprise Financial	67.6	0.3	UBS	0.0	-0.2
Covanta	57.7	0.3	Bristol-Meyers Squibb	0.0	-0.2
CenturyLink	73.3	0.3	United Parcel Service	0.0	-0.2
American Express	96.1	0.3	Abbott Laboratories	33.6	-0.2
Altria Group	98.0	0.3	Eli Lilly	0.0	-0.2
<b>Total</b>	<b>\$798.8</b>	<b>3.1</b>	<b>Total</b>	<b>\$297.3</b>	<b>-2.1</b>

# GBI QUANT

# GBI Quant

## *Diversification Benefits*

- Quantitative strategies add diversification benefits to fundamental strategies
- Alpha correlation between GBI Core and GBI Quant is 0.17



Source: Instinet

# GBI Quant

Performance as of December 31, 2012

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2012	547	18.6	245
2011	250	-8.4	-101
2010	182	14.2	158
2009*	170	28.3	502

Annualized	Investment Return (%)	Alpha (bps)	Tracking Error	Information Ratio
1-Year	18.6	245	1.2%	2.0
3-Year	7.5	85	1.6%	0.5
Since Inception	14.2	206	2.1%	1.0

Lead Investment Manager: Mark Albert

Notes

Benchmark is MSCI All Country World

\*Inception: June 2009

Tracking Error: annualized standard deviation of monthly excess returns

Information Ratio: annualized excess returns/tracking error

# GBI Quant Attribution

## Performance and Risk

### GBI Quant Relative Performance and Risk

	2012	2011	2010	2009	Cumulative	Annualized	
						3-Year	ITD
<b>Attribution (bps) – Alpha</b>							
Stock	232	(91)	158	520	946	86	198
Region	7	(13)	(10)	(17)	(13)	(7)	(3)
Sector	6	3	10	(1)	52	6	11
<b>Total</b>	<b>245</b>	<b>(101)</b>	<b>158</b>	<b>502</b>	<b>985</b>	<b>85</b>	<b>206</b>
<b>Risk Factors (%)</b>							
Stock Specific	47%	35%	45%	61%	43%	42%	43%
Region / Currency	20%	18%	15%	9%	16%	18%	16%
Sector	2%	5%	8%	3%	5%	5%	5%
Leverage	0%	1%	1%	2%	1%	1%	1%
Momentum	6%	-2%	0%	1%	1%	2%	1%
Size	15%	6%	13%	10%	11%	11%	11%
Value	5%	13%	9%	4%	8%	9%	8%
Volatility	3%	23%	5%	7%	10%	10%	10%
Growth	0%	0%	0%	1%	0%	1%	1%
Size Nonlinearity	1%	1%	2%	2%	2%	1%	2%
Liquidity	1%	2%	1%	0%	1%	1%	0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

# GBI Quant

## Investment Process

Three Distinct Strategies		
Strategic	Dynamic	Macro Distance
\$222 Million 41%	\$194 Million 35%	\$131 Million 24%
50 Models Long-term Static Factors & Equal Weights	48 Models Dynamic Flexible Factors & Weights	48 Models Macro Regimes Flexible Factors & Weights
Developed Markets <ul style="list-style-type: none"> <li>Region / Sector Models</li> </ul> Emerging Markets <ul style="list-style-type: none"> <li>Country Models</li> </ul>	Country Models	Country Models
Launched June 2009	Launched September 2009	Launched March 2012

Quantitative Platform Alpha Correlation				
		2012		
		Quant Strategic	Quant Dynamic	Quant Macro Distance
Inception To-Date	Quant Strategic	1.00	0.57	-0.52
	Quant Dynamic	0.43	1.00	-0.03
	Quant Macro Distance	-0.52	-0.03	1.00

# GBI US HIGH QUALITY

# The TRS Definition of Quality

- Return on Equity (ROE)
- Gross margin
- Intangible assets as a percent of total assets (proxy for franchise value)
- Beta to bond spread returns (Core – High Yield)

	US High Quality		MSCI USA	
	Average	Z-Score	Average	Z-Score
ROE Factor	31.6	3.0	21.9	0.9
Gross Margin	59.3	2.9	44.0	0.9
Intangible Assets to Total Assets	34.5	2.6	23.8	0.8
Beta to Bond Spread	-68.1	2.6	-115.8	0.8

# GBI US High Quality

*Portfolio Characteristics as of December 31, 2012*

Portfolio Characteristics		GBI US High Quality		MSCI USA	
		2012	2011	2012	2011
<b>Valuation Metrics</b>	Market Capitalization	\$105.1B	\$126.8B	\$100.1B	\$91.2B
	Price/Earnings – Trailing	17.5x	15.2x	15.3x	13.3x
	Price/Earnings – Forward	14.3x	13.3x	13.8x	12.7x
	Price/Book	3.6x	3.3x	2.1x	2.0x
	Dividend Yield	2.7%	2.5%	2.2%	2.1%
<b>Quality Metrics</b>	Estimated 3-5 Year EPS Growth	9.9%	9.6%	10.6%	11.3%
	Return on Equity	25.1%	27.9%	19.0%	20.6%
	Long-Term Debt/Capital	37.7%	29.6%	34.2%	31.9%
<b>Risk Metric</b>	Beta	0.8	0.8	1.0	1.0

# GBI US High Quality

Performance as of December 31, 2012

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2012	99	17.3	117
2011*	100	-4.8	-86

Annualized	Investment Return (%)	Alpha (bps)	Tracking Error	Information Ratio
1-Year	17.3	117	4.0%	0.3
Since Inception	7.6	8	4.6%	0.0

Notes

Benchmark is MSCI USA Index

\*Inception: July 2011

Purposes: Semi-passive Portfolio

Strategic Positioning/Flexibility

Tracking Error: annualized standard deviation of monthly excess returns

Information Ratio: annualized excess returns/tracking error

# GBI US High Quality

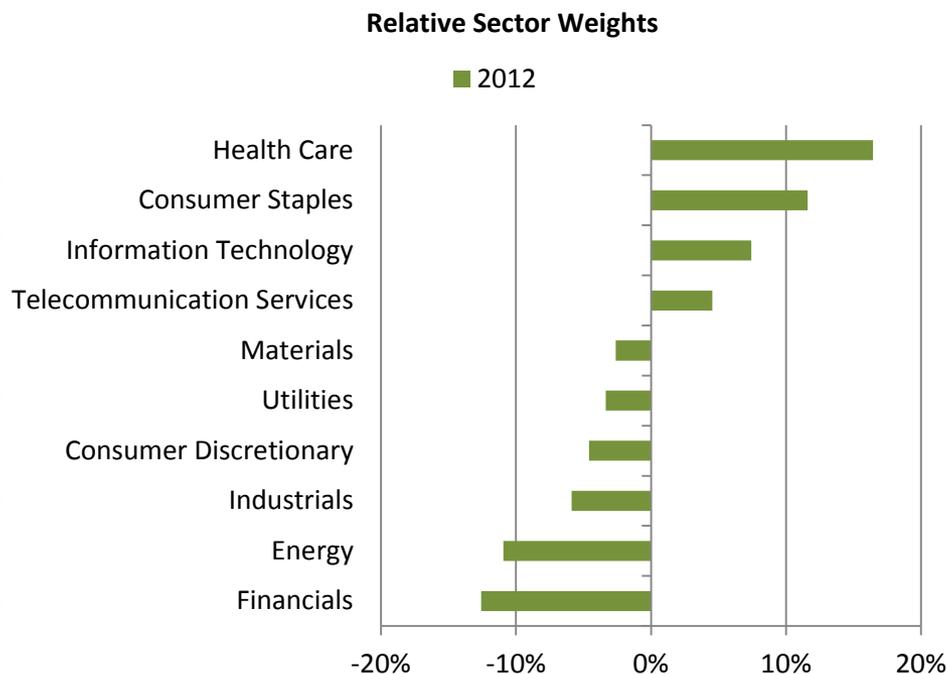
*Top Ten Holdings as of December 31, 2012*

Company	GBI US High			
	Market Value (\$ in millions)	Quality (%)	Benchmark (%)	Difference
Microsoft	5.2	5.2	1.5	3.7
International Business Machines	5.0	5.0	1.5	3.5
Johnson & Johnson	4.5	4.5	1.4	3.1
AT&T	4.4	4.5	1.4	3.0
Proctor & Gamble	4.3	4.3	1.4	2.9
Pfizer	4.3	4.3	1.4	2.9
Coca-Cola	3.8	3.8	1.1	2.7
Oracle	3.7	3.7	1.0	2.8
Philip Morris International	3.3	3.3	1.0	2.2
Merck	2.9	2.9	0.9	2.0
<b>Total</b>	<b>\$41.4</b>	<b>41.5</b>	<b>12.6</b>	<b>28.8</b>

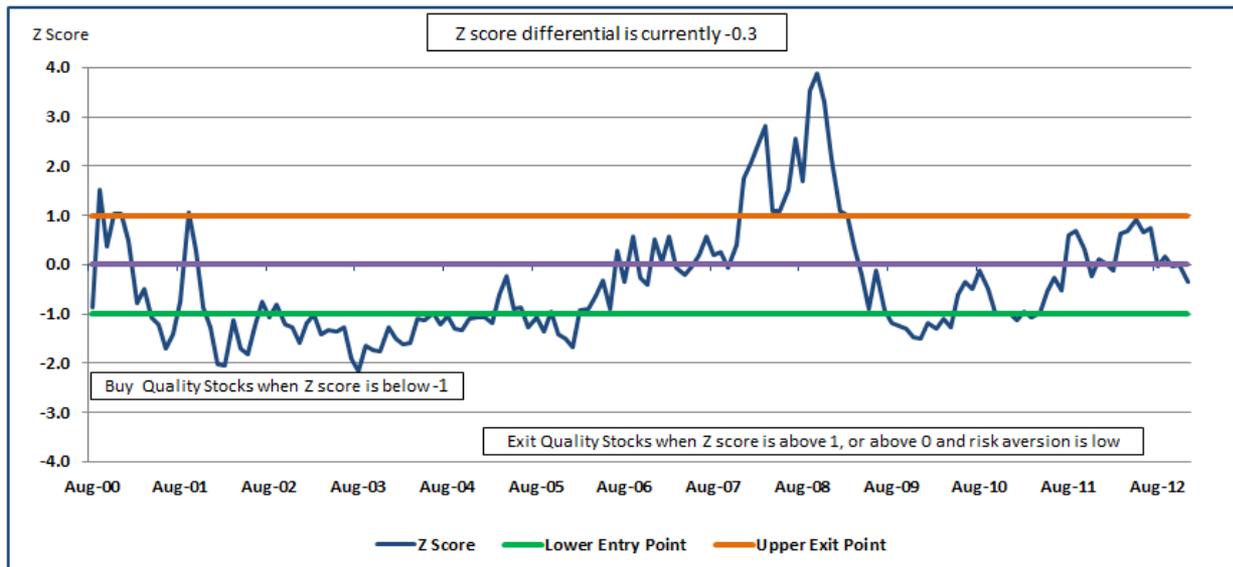
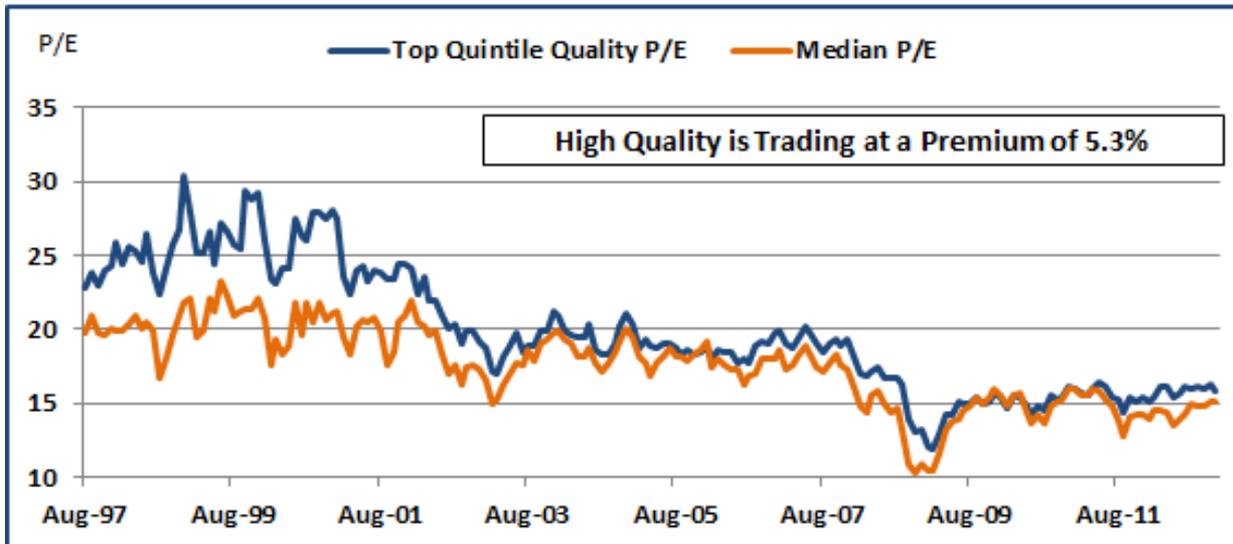
# GBI US High Quality

*Positioning as of December 31, 2012*

Sectors	GBI US High Quality	Over/Under
Health Care	28.3%	16.4%
Consumer Staples	22.1%	11.6%
Information Technology	26.4%	7.4%
Telecommunication Services	7.6%	4.3%
Materials	1.0%	-2.6%
Utilities	0.0%	-3.4%
Consumer Discretionary	7.5%	-4.6%
Industrials	4.2%	-5.9%
Energy	0.0%	-10.9%
Financials	2.9%	-12.4%



# Relative Attractiveness of High vs. Low Quality



GBI GOLD

# GBI Gold

*Performance as of December 31, 2012*

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2012	816	2.0	233
2011	705	-5.8	248
2010	491	35.3	57
2009*	266	5.2	-3

Annualized	Investment Return (%)	Alpha (bps)	Tracking Error	Information Ratio
1-Year	2.0	233	2.5%	0.9
3-Year	9.1	195	2.2%	0.9
Since Inception	10.1	181	2.1%	0.9

Notes

Benchmark: 35% Gold ETF (GLD), 15% Silver ETF (SLV), and 50% Precious Metals Equities Index (based on XAU Index)

\*Inception: October 2009

# GBI Gold

## *Rationale*

---

- Diversification against systemic risk and unexpected rise in inflation
- Part of IMD Real Return Portfolio
- Unique expertise within the IMD
  - Portfolio Manager is author of three books on precious metals investing
- Portfolio custom benchmark
  - Precious Metals (via ETFs): 35% Gold, 15% Silver
  - Mining Companies: 50%

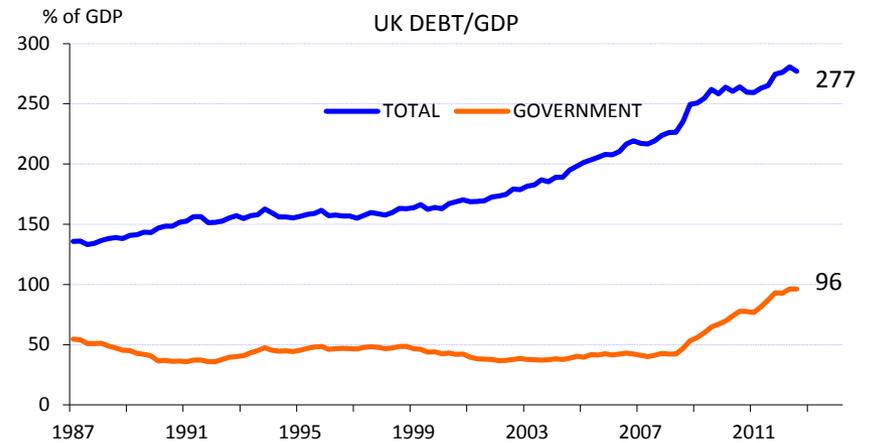
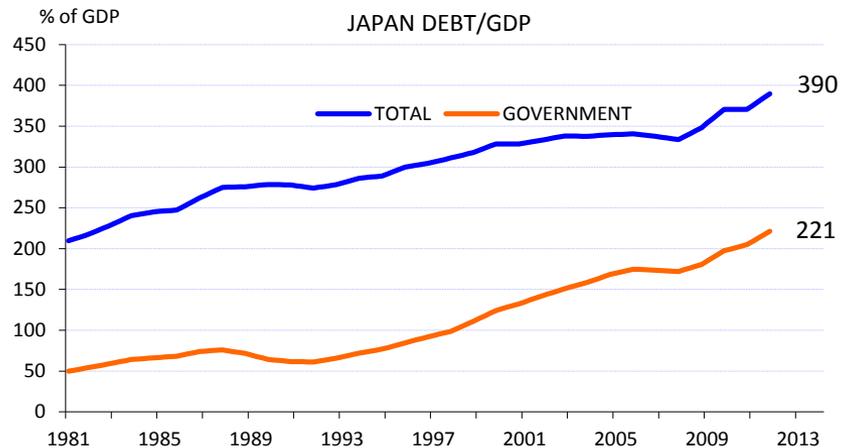
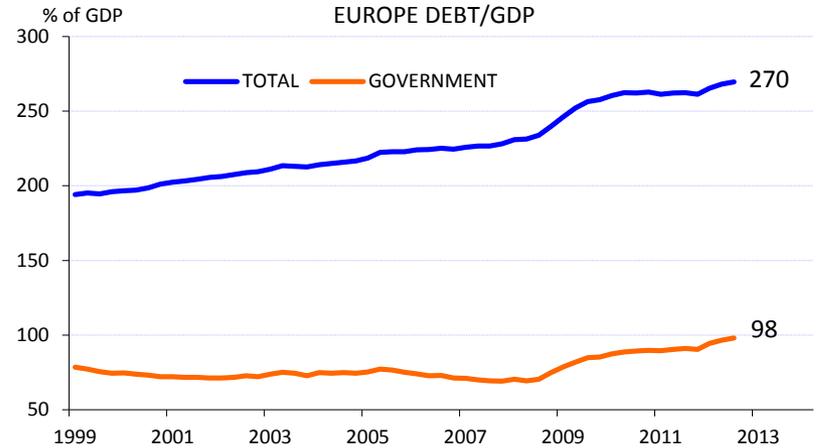
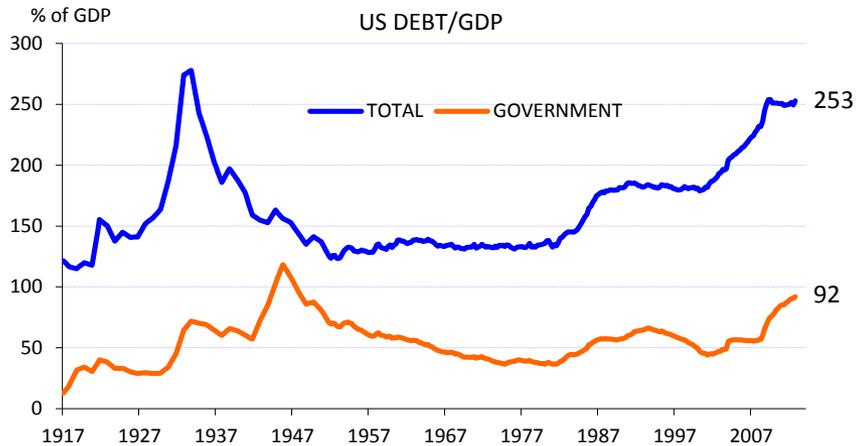
# GBI Gold

## *Positioning as of December 31, 2012*

- TRS is the 14<sup>th</sup> largest institutional holder of GLD
- TRS is the largest institutional holder of SLV

Company	Market Value (\$ in millions)	GBI Gold Fund (%)	Benchmark (%)	Difference
SPDR Gold Trust ETF	290.6	35.6	35.0	0.6
iShares Silver Trust ETF	121.2	14.9	15.0	-0.2
GoldCorp	46.8	5.7	3.9	1.9
New Gold	34.0	4.2	2.1	2.0
Silver Wheaton	33.9	4.2	2.0	2.1
Randgold Resources	25.1	3.1	1.9	1.2
Allied Nevada Gold	22.3	2.7	1.3	1.5
Detour Gold	21.6	2.6	0.0	2.6
Gold Fields	18.7	2.3	1.6	0.8
First Majestic Silver	16.9	2.1	0.0	2.1
<b>Total</b>	<b>\$631.1</b>	<b>77.3</b>	<b>62.7</b>	<b>14.6</b>

# Debt to GDP Continues to Rise Globally



Source: Morgan Stanley



# ACCOMPLISHMENTS, PRIORITIES & COLLABORATION

# IPM Accomplishments and Priorities

## 2012 Accomplishments

- Integrated Trust TAA models into GBI Process
- Communicated the GBI investment philosophy and framework to the IMD Management Committee
- Completed a factor exposure review for GBI relative exposure to high quality, value, small cap, and momentum
- Implemented an external manager signal report for US stocks

## 2013 Priorities

- Develop a road map for the GBI 2017 vision
- Expand the Quant platform
- Develop and implement the process for a GBI Alpha Opportunity platform
- Partner with State Street on the evaluation of flow indicators

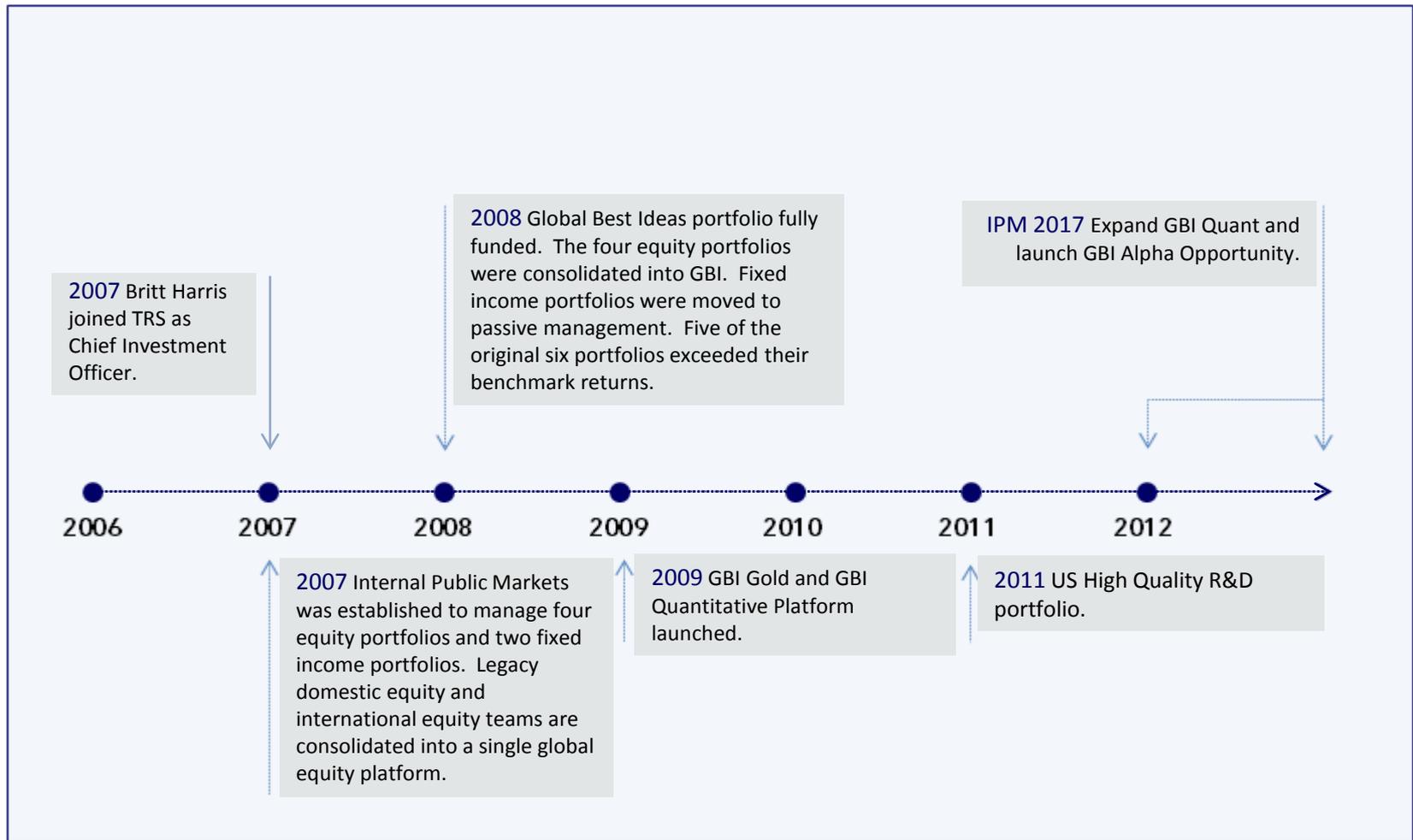
# Trust-Wide Collaboration

---

- Performed valuation and industry analysis for 19 investment opportunities with the Private Equity and Real Assets groups
- Provided global industry analysis for other areas of the Trust
- Designed quantitative factor portfolios
- Developed the *European Crisis Monitor*
- Participated in investment task forces
  - Europe
  - Hard assets
  - Residential housing
- Hosted IPM global industry investment symposia bringing in the best and the brightest to discuss
  - US Financials
  - Global Energy
  - Global Technology
  - Emerging Market Consumer
  - Gold

# IPM 2017 AND TRUST-WIDE INITIATIVES

# IPM Timeline



# IPM 2017

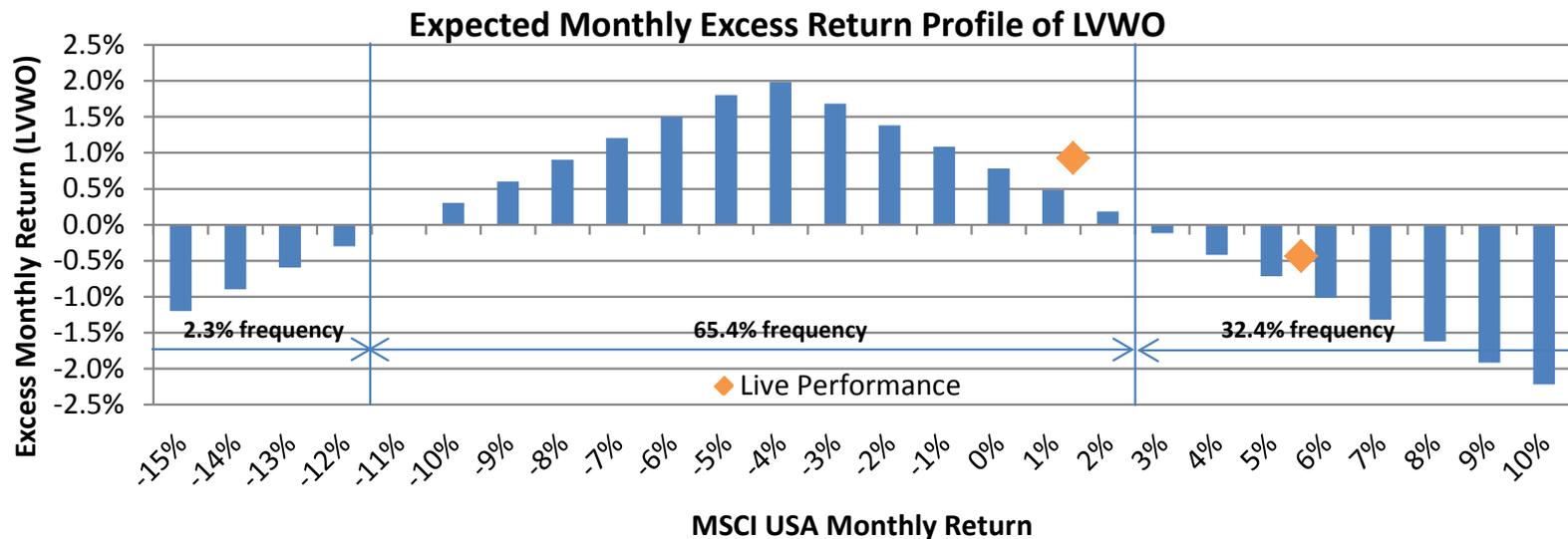
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- Expanding Quantitative Platform within GBI Flagship
  - Positive Alpha Contribution
  - Low Correlation
  - Better Long-term Diversification
- Collaborate with other IMD Units
  - Low Vol with Overlay (Risk Group)
  - GBI Alpha Opportunity (Private Markets and External Public)

# Trust-wide Portfolios and Initiatives

## Low Vol with Overlay

- Launched January 1, 2013 at \$100 million
- Collaborative project with the Risk Group
- Benchmark: MSCI USA
- Combines Low Vol Factor Portfolio with Put Selling Risk Premium



Assumptions: Equity beta of 0.70 (long-term beta assumption), option premium of 103bps, 4.2% strike (historical average since 2006), 2% annualized expected low volatility risk premium. Historical frequencies using S&P 500 monthly returns since 1928.

# GBI Alpha Opportunity

## *Representative Due Diligence*

---

- Pre-IPO Commitments
  - Investment in companies prior to their initial public offering
  - Harvest illiquidity premium through negotiated discount
- PIPE Transactions
  - Private investment in public equity
  - Capture discount to current market price because company avoids costs of the public offering process

# SUMMARY

# Summary

## *Internal Active Equity Portfolio Management*

---

- GBI is performing above targets
  - Fulfilling its role in the Trust's overall strategy
  - Expanding size of quantitative portfolios
- Other Internal Portfolios are meeting Trust goals
  - Gold: Alpha and diversification
  - US High Quality: Tactical and diversifying
- Collaboration across the IMD is effective and increasing
- 2017 plans are being developed
  - Risk premium strategies, e.g., Low Vol with Overlay (jointly managed with Risk Group)
  - GBI Alpha Opportunity (with External Public and Private Equity Teams)

# APPENDIX

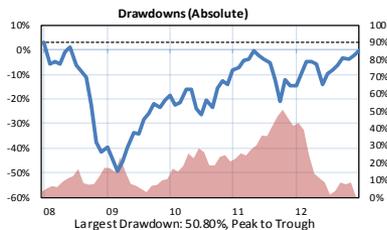
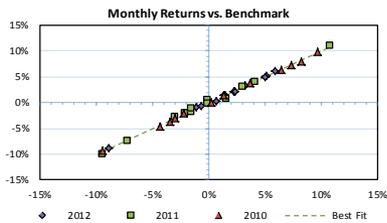
# GBI Flagship STAR Report



## GBI Flagship vs. MS ACWI FREE (NET)

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 12/07 to 12/12



Period	Portfolio	B'mark	VFB	T.E.	I.R.
3-month	2.92%	2.88%	0.04%		
YTD	16.78%	16.13%	0.65%		
1-year	16.78%	16.13%	0.65%	0.59%	1.10
2-year	4.06%	3.73%	0.33%	1.05%	0.32
3-year	6.91%	6.63%	0.28%	0.94%	0.30
5-year	(0.65%)	(1.16%)	0.51%	1.41%	0.36
10-year	N/A	N/A	N/A	N/A	N/A
Inception	(0.09%)	(0.68%)	0.59%	1.41%	0.42

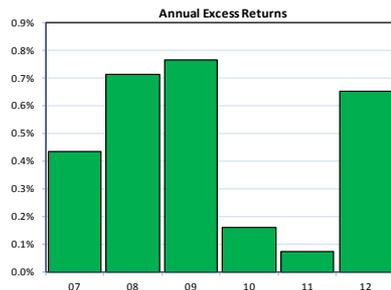
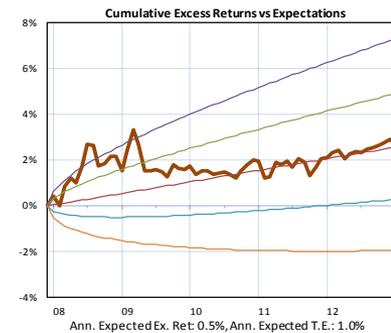
Year	Portfolio	B'mark	Excess
Start Date: 2007	2.82%	2.39%	0.43%
12/31/07	(41.49%)	(42.21%)	0.72%
2009	35.40%	34.63%	0.77%
End Date: 2010	12.83%	12.67%	0.16%
12/31/12	(7.27%)	(7.35%)	0.07%
2012	16.78%	16.13%	0.65%

Valuation Model	
Overall Performance (Since Inception 12/19/07)	

Cumulative Performance:			
Portfolio	(0.5%)	Periods	61
Benchmark	(3.4%)	R-Squared	99.6%
Excess Return	2.9%	Tracking Error	1.4%

Annualized Performance:					
Portfolio	B'mark	Diff	Ex. Ret.	Risk Free	
Return	(0.09%)	(0.68%)	0.59%	0.52%	0.49%
St. Dev.	21.17%	21.44%	(0.27%)	1.41%	0.26%
Best Month	11.10%	11.80%	(0.71%)	0.95%	0.38%
Worst Month	(19.47%)	(19.82%)	0.35%	(1.14%)	(0.01%)
Skew	(0.62)	(0.61)		-0.22	
Kurtosis	0.70	0.74		0.98	
Best 12 Mths	55.62%	58.12%			
Worst 12 Mths	(46.77%)	(48.21%)			
Up Capture	69.00%	68.99%			
Down Capture	(46.23%)	(46.92%)			

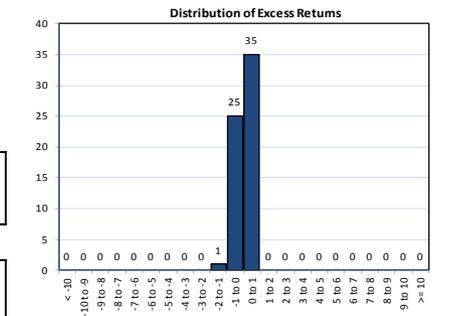
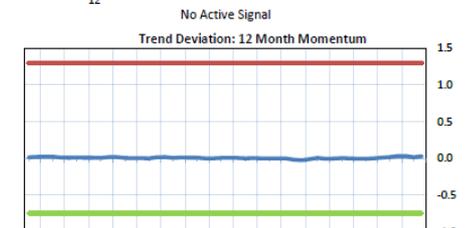
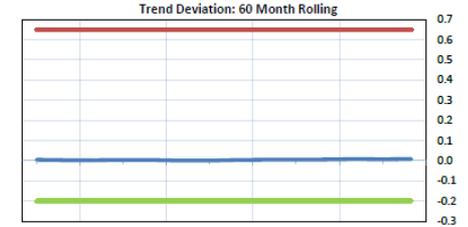
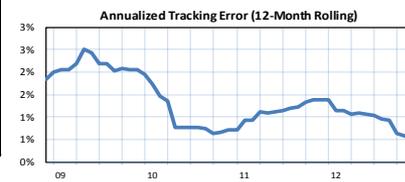
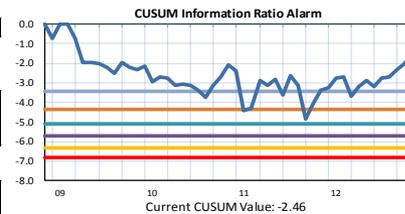
Risk Summary:					
Info. Ratio	0.42	Sharpe	(0.03)	Hit Rt Up	52%
M2 Premium	-0.10%	Treynor	(0.01)	Hit Rt Dn	64%
Beta	0.99	Sortino	0.36	Hit Rt Tot	57%
Jensen's alpha	0.57%	5% hVar	(0.64%)		



## GBI Flagship vs. MS ACWI FREE (NET)

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 12/07 to 12/12



Hit Rate Analysis:			
	Periods	Hit Rate	Avg Ex Ret
Benchmark Up	33	51.5%	(0.00%)
Benchmark Down	28	64.3%	0.10%
All Periods	61	57.4%	0.04%

Hit Rate During Various Environments:			
Value / Growth	Value	Neutral	Growth
	Outperf.		Outperf.
Periods	17	28	16
Hit Rate	23.5%	57.1%	93.8%
Avg Ex Ret	(0.25%)	0.02%	0.40%
Sm Value / Sm Grow	Value	Neutral	Growth
	Outperf.		Outperf.
Periods	13	37	11
Hit Rate	38.5%	56.8%	81.8%
Avg Ex Ret	(0.15%)	(0.02%)	0.49%
Equity Size	Large	Neutral	Small
	Outperf.		Outperf.
Periods	12	29	20
Hit Rate	33.3%	69.0%	55.0%
Avg Ex Ret	(0.03%)	0.08%	0.04%
Core / High Yield	Core	Neutral	High
	Outperf.		Yield
Periods	14	19	28
Hit Rate	57.1%	63.2%	53.6%
Avg Ex Ret	0.16%	0.04%	(0.01%)

US / Intl Bonds	US	Neutral	Global
	Outperf.		Outperf.
Periods	16	27	18
Hit Rate	62.5%	55.6%	55.6%
Avg Ex Ret	0.06%	0.03%	0.05%
Stocks / Bonds	Stocks	Neutral	Bonds
	Outperf.		Outperf.
Periods	29	8	24
Hit Rate	51.7%	75.0%	58.3%
Avg Ex Ret	(0.02%)	0.05%	0.12%
US / Intl Stocks	US	Neutral	Intl
	Outperf.		Outperf.
Periods	21	20	20
Hit Rate	52.4%	75.0%	45.0%
Avg Ex Ret	(0.08%)	0.26%	(0.03%)



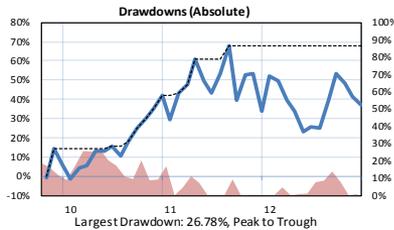
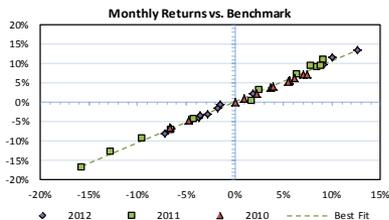
# GBI Gold Fund STAR Report



## Gold Fund vs. Gold Fund Benchmark

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 10/09 to 12/12



**Performance by Period (Inception: 10/31/09)**

Period	Portfolio	B'mark	VFB	T.E.	I.R.
3-month	(10.71%)	(10.47%)	(0.24%)		
YTD	1.99%	(0.33%)	2.33%		
1-year	1.99%	(0.33%)	2.33%	2.46%	0.94
2-year	(1.97%)	(4.38%)	2.41%	2.81%	0.86
3-year	9.14%	7.19%	1.95%	2.32%	0.84
5-year	N/A	N/A	N/A	N/A	N/A
10-year	N/A	N/A	N/A	N/A	N/A
Inception	10.11%	8.30%	1.81%	2.23%	0.81

**Performance by Year:**

Year	Portfolio	B'mark	Excess	
Start Date: 2009	5.19%	5.21%	(0.03%)	
10/31/09	2010	35.30%	34.73%	0.57%
2011	(5.79%)	(8.27%)	2.48%	
End Date: 2012	1.99%	(0.33%)	2.33%	

**Valuation Model**  
Overall Performance (Since Inception 10/31/09)

**Cumulative Performance:**

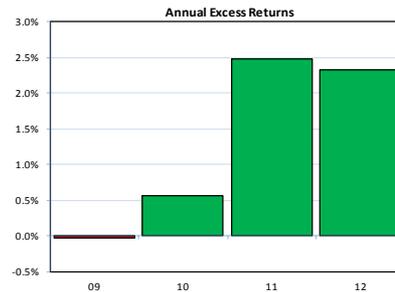
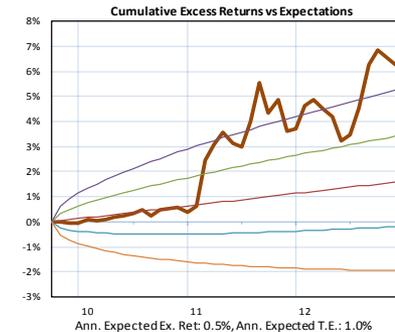
Portfolio	B'mark	Periods	39
Portfolio	36.8%	Periods	39
Benchmark	29.6%	R-Squared	99.5%
Excess Return	7.2%	Tracking Error	2.2%

**Annualized Performance:**

Portfolio	B'mark	Diff	Ex. Ret.	Risk Free	
Return	10.11%	8.30%	1.81%	1.97%	0.09%
St. Dev.	26.19%	24.93%	1.26%	2.23%	0.02%
Best Month	15.00%	15.03%	(0.04%)	1.81%	0.02%
Worst Month	(16.88%)	(15.71%)	(1.16%)	(1.21%)	(0.01%)
Skew	(0.21)	(0.22)		0.52	
Kurtosis	(0.53)	(0.54)		1.20	
Best 12 Mths	42.51%	38.08%			
Worst 12 Mths	(18.67%)	(18.67%)			
Up Capture	112.59%	104.18%			
Down Capture	(53.00%)	(52.33%)			

**Risk Summary:**

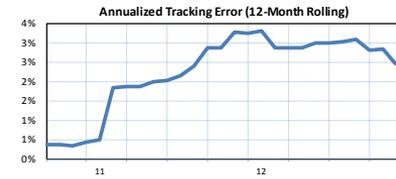
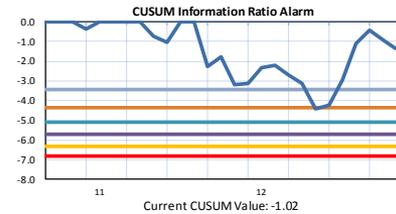
Info. Ratio	0.81	Sharpe	0.38	Hit Rt Up	77%
Info. Ratio	0.81	Sharpe	0.38	Hit Rt Up	77%
M2 Premium	9.63%	Treynor	0.10	Hit Rt Dn	47%
Beta	1.05	Sortino	0.33	Hit Rt Tot	64%
Jensen's alpha	1.41%	5% hVar	(0.92%)		



## Gold Fund vs. Gold Fund Benchmark

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 10/09 to 12/12

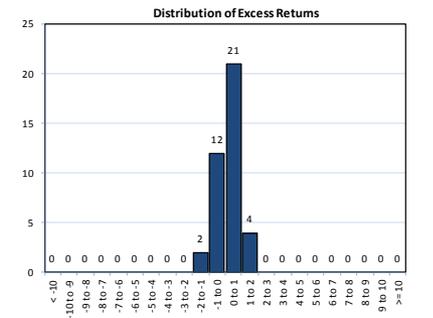
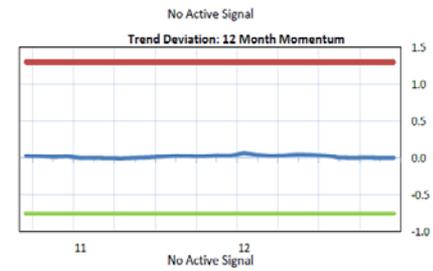
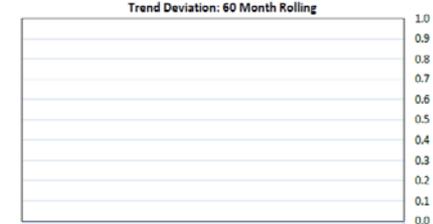


**Hit Rate Analysis:**

Periods	Hit Rate	Avg Ex Ret	
Benchmark Up	22	77.3%	0.37%
Benchmark Down	17	47.1%	(0.10%)
All Periods	39	64.1%	0.16%

**Hit Rate During Various Environments:**

Value/ Growth	Value	Neutral	Growth
Value/ Growth	Value	Neutral	Growth
Outperf.	Outperf.	Outperf.	Outperf.
Periods	8	21	10
Hit Rate	62.5%	66.7%	60.0%
Avg Ex Ret	(0.09%)	0.24%	0.21%
Sm Value/ Sm Grow	Value	Neutral	Growth
Outperf.	Outperf.	Outperf.	Outperf.
Periods	3	31	5
Hit Rate	66.7%	61.3%	80.0%
Avg Ex Ret	0.04%	0.16%	0.28%
Equity Size	Large	Neutral	Small
Outperf.	Outperf.	Outperf.	Outperf.
Periods	7	21	11
Hit Rate	57.1%	52.4%	90.9%
Avg Ex Ret	0.26%	0.04%	0.34%
Core/ High Yield	Core	Neutral	High
Outperf.	Outperf.	Outperf.	Yield
Periods	6	15	18
Hit Rate	33.3%	46.7%	88.9%
Avg Ex Ret	(0.32%)	0.10%	0.38%



**US/Int'l Bonds**

	US	Neutral	Global
US/Int'l Bonds	US	Neutral	Global
Outperf.	Outperf.	Outperf.	Outperf.
Periods	10	19	10
Hit Rate	60.0%	57.9%	80.0%
Avg Ex Ret	(0.33%)	0.29%	0.42%

**Stocks/ Bonds**

	Stocks	Neutral	Bonds
Stocks/ Bonds	Stocks	Neutral	Bonds
Outperf.	Outperf.	Outperf.	Outperf.
Periods	21	5	13
Hit Rate	76.2%	80.0%	38.5%
Avg Ex Ret	0.31%	0.31%	(0.13%)

**US/Int'l Stocks**

	US	Neutral	Int'l
US/Int'l Stocks	US	Neutral	Int'l
Outperf.	Outperf.	Outperf.	Outperf.
Periods	14	13	12
Hit Rate	50.0%	76.9%	66.7%
Avg Ex Ret	(0.14%)	0.50%	0.16%





# Trading Annual Review

Bernie Bozzelli

Senior Director for Trading

# Agenda

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- Mandate
- Team Profile
- Who We Serve
- Trading Partner Network
- Broker Certification
- Equity Trading Performance
- Transition Management
- Foreign Exchange
- Passive Portfolio Management
  - Strategic Beta
- 2012 Priorities Update
- 2013 Priorities
- Appendix

# Trading Mandate

## Implementation

- Global execution across multiple asset classes including equities, futures, forwards, options, treasuries, TIPS, and foreign exchange
  - Manage a global network of 44 brokerage firms
  - Monitor key variables that contribute to trading include volatility, liquidity, and market structure
  - Multi-asset execution totaled \$285 billion for 2012 (Futures and forwards monthly/quarterly roll process is biggest contributor)
  - Outperformed the median equity trading desk by eight basis points in 2012, retaining \$29.3 million of TRS alpha which placed TRS in the first quartile versus our peer universe. TRS trading has placed in the first quartile in four of the last five years
- 

## Index Management

- Passive Management
    - Long Treasuries – \$13.2 billion
    - US TIPS – \$5.7 billion
    - Approximately \$2 billion in LCV, LCG, SC, EAFE+Can, and Emerging Markets
  - Benchmark indices are fully replicated in the portfolio in real-time to achieve tight tracking error and in-line performance
- 

## Market Intelligence

- Collaborate across the division to provide implementation solutions. Work with SAA, TAA, IPM and EPU to develop optimal implementation strategies
  - Examples include assessing the market impact of a trade, transition management between external managers, short-term technical model to aid in the timing of execution, Foreign Exchange (FX) hedging analysis and Options Analysis
-

# Trading Team



**Bernie Bozzelli, CFA**  
**Senior Director**  
*MPA, Accounting, UT Austin*  
*18 years TRS*



**Jaime Llano**  
**US Equity, Futures and Currency**  
*BS, Finance, UT Austin*  
*MBA, Finance, St. Edwards*  
*8 years TRS*  
*14 years experience*



**Demetrius Pope**  
**Global Equity - Europe**  
*BBA, Sam Houston*  
*6 years TRS*  
*12 years experience*



**Pat Barker**  
**Trading Analyst**  
*24 years TRS*  
*36 years experience*



**Scott Moore**  
**Global Equity - Asia**  
*MBA, Thunderbird University*  
*9 years TRS*  
*35 years experience*



**Komson Silapachai, CFA**  
**US Equity, LATAM, Canada and Fixed Income**  
*BS, Finance, Texas A&M*  
*6 years TRS*  
*6 years experience*



**Babette Ruiz**  
**Team Support**  
*2 years TRS*  
*15 years experience*



**Steve Peterson**  
**US Equity and Fixed Income**  
*MBA, California Lutheran University*  
*5 years TRS*  
*18 years experience*

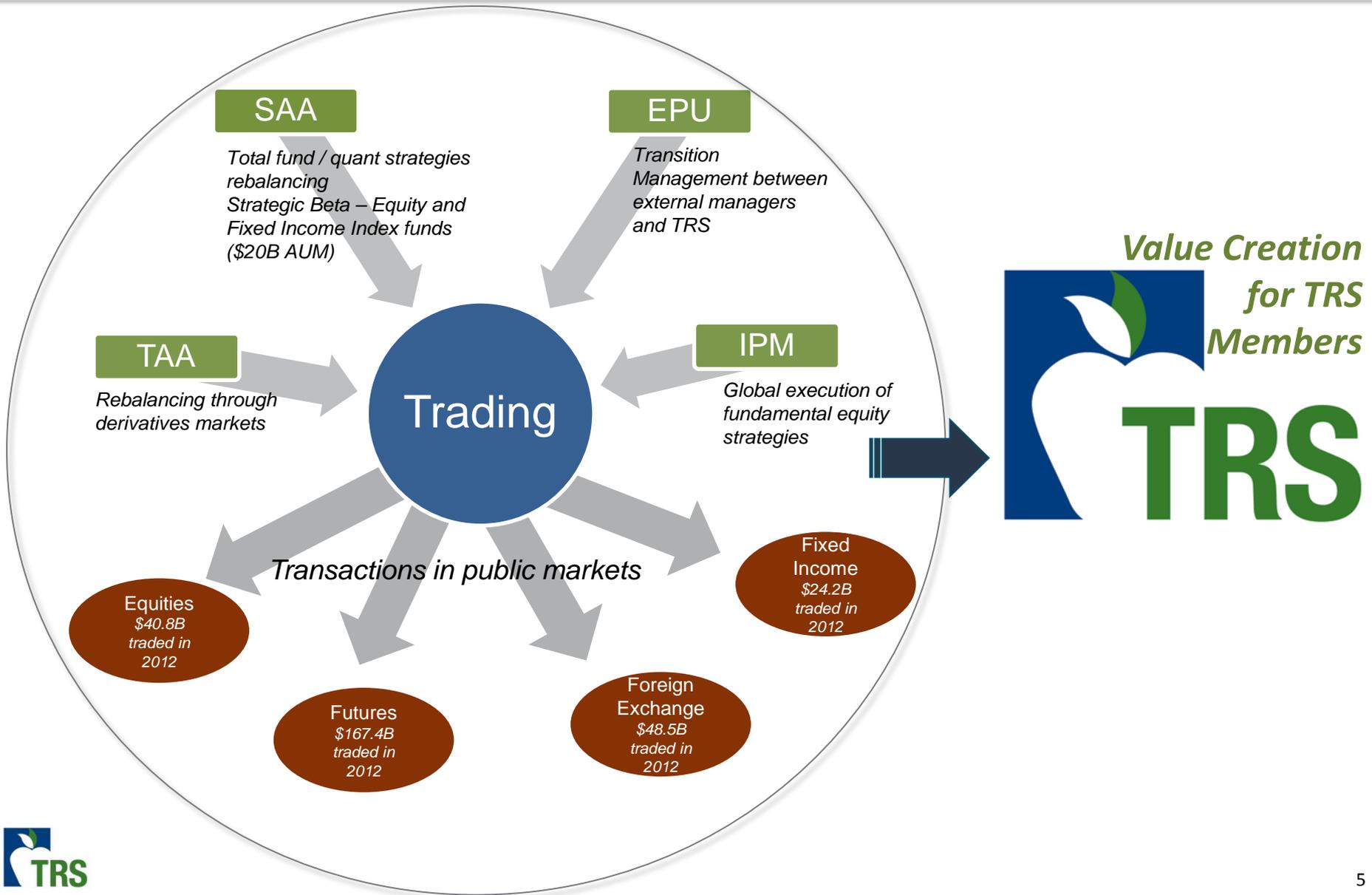


**Jared Morris, CFA**  
**US Equity and Futures**  
*BBA, Accounting, Texas A&M*  
*MS, Finance, Texas A&M*  
*2 years TRS*  
*7 years experience*

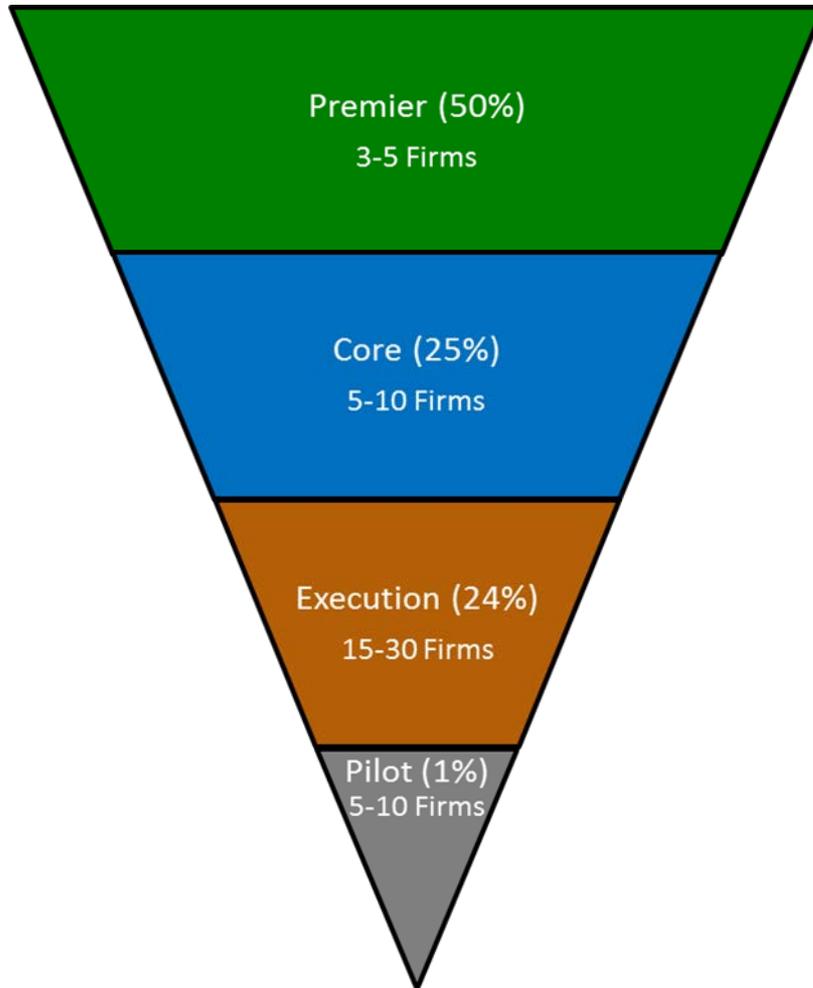
**3 MBA's**  
**3 CFA's**  
**1 Masters of Accounting**  
**1 MS, Finance**  
**16 Years Average Experience**

# Who We Serve

## Cross-Divisional Collaboration



# Trading Partner Network



## 4 Firms

- Deliver focused and high capacity relationships globally and across all asset classes
- Highly integrated with TRS trading, risk management, administrative systems, etc.
- Leading providers of investment services – TRS is a preferred client, receiving the highest level of service available

## 6 Firms

- Well established firms with overall world class global services capabilities
- World renowned for research and technology
- Best-of-breed product process development

## 27 Firms

- Includes firms who have a specialty in finding liquidity for hard-to-trade names or firms who have a niche in electronic trading
- Firms who have a core competency of trading internationally in particular regions are also included

## 7 Firms

- All newly approved firms doing business with TRS

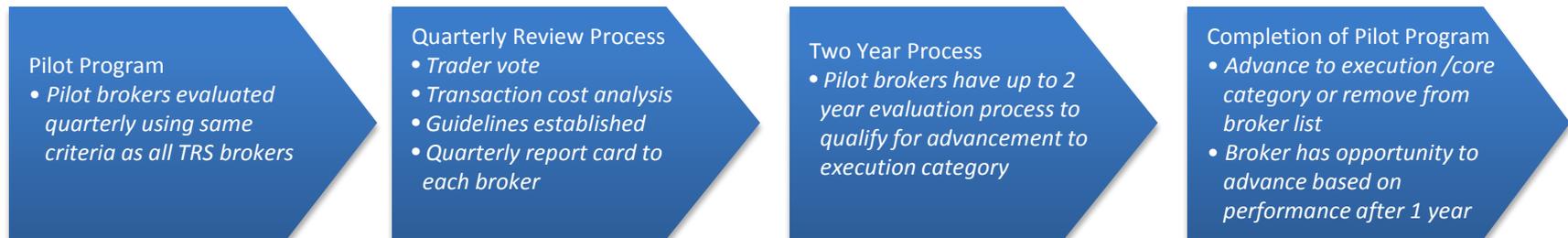
# Broker Certification Process

## Phase 1 - Certification Process for New Firms



*If acceptable, then ...*

## Phase 2 - Broker added to Pilot Program



# Equity Trading Performance

	1Q12	2Q12	3Q12	4Q12	2012	2011
TRS Performance vs. Post Trade Ace (bps)	9	6	4	2	5	2
Median Desk Performance vs. Post Trade Ace (bps)	-2	-3	-3	-2	-3	-1
TRS vs. Median Desk (bps)	11	9	7	4	8	3
TRS vs. Median Desk (\$ in millions)	\$10.4	\$8.9	\$6.7	\$3.3	\$29.3	\$15.4
1st Quartile Desk Performance vs. Post Trade Ace (bps)	4	3	3	4	3	3
TRS vs. 1st Quartile Desk (bps)	5	3	1	-2	2	-1
TRS Quartile Placement	1st	1st	1st	2nd	1st	2nd

*\*Source: ITG/Plexus*

- The total Equity trading cost for 2012 includes \$51.5 million in market impact (14 bps) and \$35.6 million in commissions and fees (9 bps)
- How is trading measured?
  - Consistently outperformed the peer median and has placed in the first quartile in four of the last five years
  - Every order is measured versus the order arrival price and adjusted by ITG/Plexus' Post Trade Ace benchmark in order to account for current market conditions
  - Trade Management Group's benchmark-adjusted performance is then compared to the benchmark-adjusted performance of its peers



*\*ITG/Plexus is the leading independent transaction cost provider. Their client base entails the largest peer universe compared to their competitors.*

# Transition Management Process



# Foreign Currency Execution Process

Why does TRS trade currencies?

- Equity Settlements
- Repatriation
- Hedging within TAA



How Trading adds value:



# Portfolio Management: Strategic Beta

## Treasuries and TIPS

- “Strategic Beta” mandate – Manage to a minimum tracking error/maximize information ratio objective
- Treasuries and TIPS portfolios are actively managed along with the Strategic Asset Allocation (SAA) team with low tracking error

### How Trading adds value:



	Percent of Trust	2012 Return	Value Added	Tracking Error	Information Ratio
Long Treasuries	12%	4.2%	0.6%	0.2%	2.7
TIPS	5%	7.1%	0.2%	0.3%	0.8

# 2012 Priorities Update

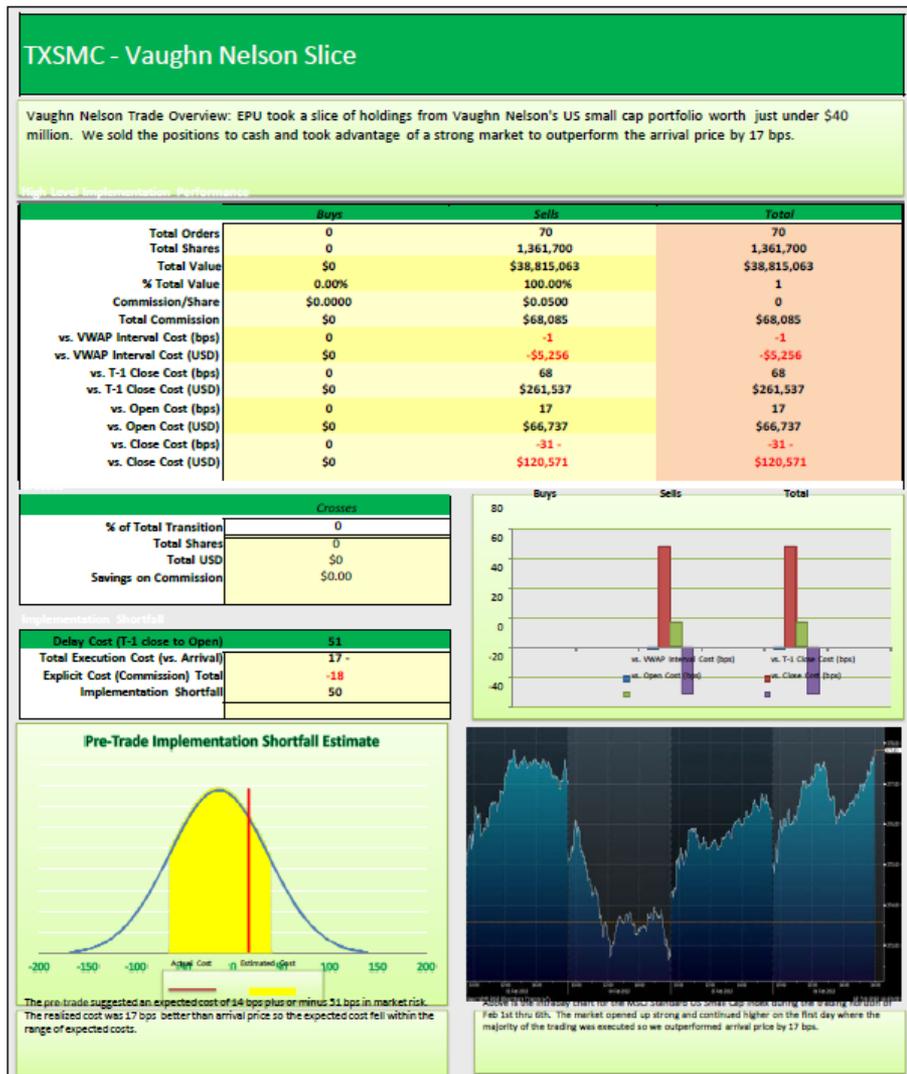
#	Priority	Results
1	<b><i>Enhanced Counterparty Communication</i></b>	<ul style="list-style-type: none"> <li>Internally developed and implemented a TRS-specific quarterly evaluation template</li> <li>Features a combined review of Equities, Futures, Fixed Income and Foreign Exchange</li> <li>Improved communication with trading partners via web portal</li> </ul>
2	<b><i>Training &amp; Best Practices</i></b>	<ul style="list-style-type: none"> <li>Completed approximately 400 hours of comprehensive training with an emphasis on Futures and Foreign Exchange through courses held at TRS, external formal classes and meetings. Formal classes included:               <ul style="list-style-type: none"> <li>Advanced Initiatives in Fixed Income Trading</li> <li>Chicago Mercantile Exchange (CME) School of Futures</li> <li>Trade Tech in New York and Europe</li> <li>International Trader Forum</li> </ul> </li> </ul>
3	<b><i>CSA on Futures</i></b>	<ul style="list-style-type: none"> <li>Investment policy approved to apply Commission Sharing Arrangement (CSA)</li> <li>Collaborated with Investment Operations to implement processes and technology</li> <li>Generated an estimated \$3.5 million CSA</li> </ul>
4	<b><i>Trade Strategy Development</i></b>	<ul style="list-style-type: none"> <li><b>Equities</b> – Implemented equity trading strategies unique to manager style based on momentum, timeframe and order size</li> <li><b>Futures</b> – Trading style customized for each account to minimize performance gaps that occur due to monthly rebalancing. In addition, we developed “queue position” and “flow analysis” strategies to achieve best execution</li> <li><b>Passive</b> – Improved execution strategies for Market On Close “MOC” type orders. Enhanced relative index performance through increased monitoring of corporate actions</li> </ul>

# 2013 Priorities

#	Priority	Objective
1	<b><i>Commission Restructure</i></b>	<ul style="list-style-type: none"> <li>• Enhance commission restructure throughout trading operation, focusing on futures and related products, Market On Close “MOC” orders, and algorithmic trading to lower cost</li> <li>• Optimize commission schedule to reduce costs while generating appropriate levels of CSA to meet obligations</li> </ul>
2	<b><i>Advance Electronic Futures &amp; FX Trading</i></b>	<ul style="list-style-type: none"> <li>• Implement Bloomberg Tradebook platform to enhance the level of direct market interaction over futures trades</li> <li>• Execute at a lower overall commission rate</li> </ul>
3	<b><i>Enhance Management of Treasuries/TIPS Index Fund</i></b>	<ul style="list-style-type: none"> <li>• Develop a “Texas Way” analytic system for risk management, valuation and monitoring of Long Treasuries and TIPS</li> <li>• Leverage TRS’ network of investors to enhance internal fixed income capabilities</li> </ul>
4	<b><i>Re-Branding</i></b>	<ul style="list-style-type: none"> <li>• Expand understanding of the role and functions of the Trading group across the IMD through enhanced reporting and quarterly “Lunch &amp; Learns”</li> </ul>

# APPENDIX

# Transition Post Trade Analysis



- Executed \$3.8 billion in transitions
- Traded 601 million shares related to transition activity
- Crossed 21.8% of shares requested by external managers internally
- In-kind transfers resulted in commission savings of \$1.6 million (14% of all estimated commissions)
- Funded 11 managers
- Took distribution from 6 managers
- Terminated 1 manager

# Market Intelligence

## Technical Analysis

### Technical Analysis by Scott Moore

#### CHART OF THE WEEK



The S&P500 had a wild oscillating week from highs to lows, but ended the week down only about 6 points. Note in the matrix below the number of ETF's getting daily sell signals, but only two, Materials and Crude Oil had weekly signals to stand aside until their next weekly buys or more important monthly trend change sells. Only one ETF, Utilities, has now signaled a trend change to the upside with daily, weekly and monthly all on buys. The S&P would require a move below 1495.02 to signal a weekly sell to step aside and a number of ETF's are beginning to approach weekly sells should the market sell much lower.

#### SCOTT'S SIGNALS

Asset Class	ETF	Daily	Weekly	Monthly
Large Cap Value	IWD	Sell	Buy	Buy
	Level for Signal Change	79.58	77.31	68.24
Large Cap Growth	IWF	Sell	Buy	Buy
	Level for Signal Change	69.54	68.08	62.14
US Smallcap	IWM	Sell	Buy	Buy
	Level for Signal Change	92.08	89.15	76.13
EAFE + CAD	VEA	Sell	Sell	Buy
	Level for Signal Change	36.8	36.8	31.98
EM	EEM	Sell	Sell	Buy
	Level for Signal Change	44.28	44.28	30.91
Treasuries	TLT	Buy	Sell	Sell
	Level for Signal Change	115.57	117.50	127.19
High Yield	HYG	Buy	Sell	Buy
	Level for Signal Change	93.3	93.75	90.09
TIPS	TIP	Buy	Sell	Sell
	Level for Signal Change	119.89	121.03	123.44
Oil	USO	Sell	Sell	Buy
	Level for Signal Change	35.04	35.49	31
Gold	GLD	Sell	Sell	Sell
	Level for Signal Change	153.93	162.95	170.01
REITs	VNQ	Sell	Buy	Buy
	Level for Signal Change	70.07	68.03	61.66

Sector	ETF	Daily	Weekly	Monthly
Consumer Discretionary	XLY	Sell	Sell	Buy
	Level for Signal Change	51.23	51.23	44.66
Consumer Staples	XLP	Buy	Buy	Buy
	Level for Signal Change	37.8	36.79	33.56
Energy	XLE	Sell	Buy	Buy
	Level for Signal Change	79.34	76.58	67.77
Financials	XLF	Sell	Buy	Buy
	Level for Signal Change	17.93	17.37	15.06
Healthcare	XLV	Sell	Buy	Buy
	Level for Signal Change	43.74	42.74	38.48
Industrials	XLI	Sell	Buy	Buy
	Level for Signal Change	41.42	40.07	35.19
Info Tech	XLK	Sell	Buy	Buy
	Level for Signal Change	29.99	29.23	27.21
Materials	XLB	Sell	Sell	Buy
	Level for Signal Change	39.12	39.6	34.44
Utilities	XLU	Buy	Buy	Buy
	Level for Signal Change	36.78	36.3	33.85