



Office of Investments

Joint Annual Meeting

Tim Barrett, CFA - CIO

Tim Bruce, Partner - NEPC

October 2018



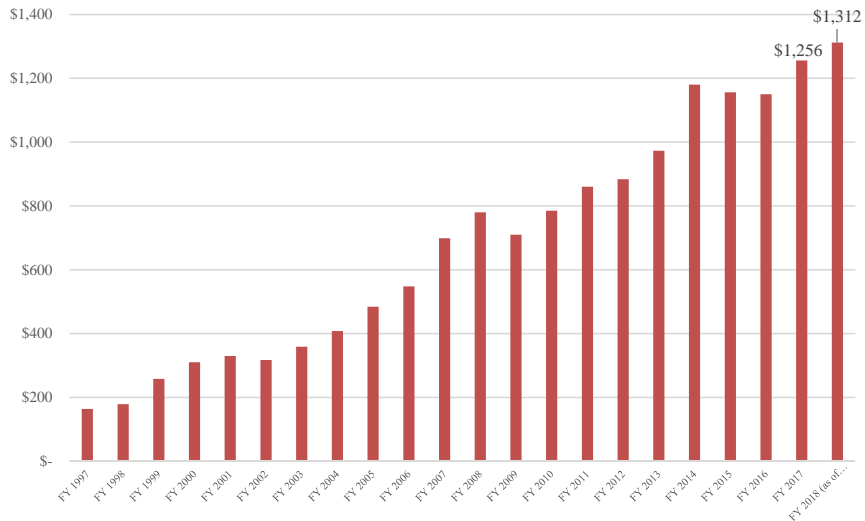
Agenda

1. Endowment Overview
2. LTIF Overview
 - Governance
 - Objective
 - Performance
3. Macro Environment (NEPC)
4. How we invest
 - Overview
 - Two Important Drivers of our Long Term Performance:
 - Overlay Program
 - MCA Program
5. Conclusion and Outlook



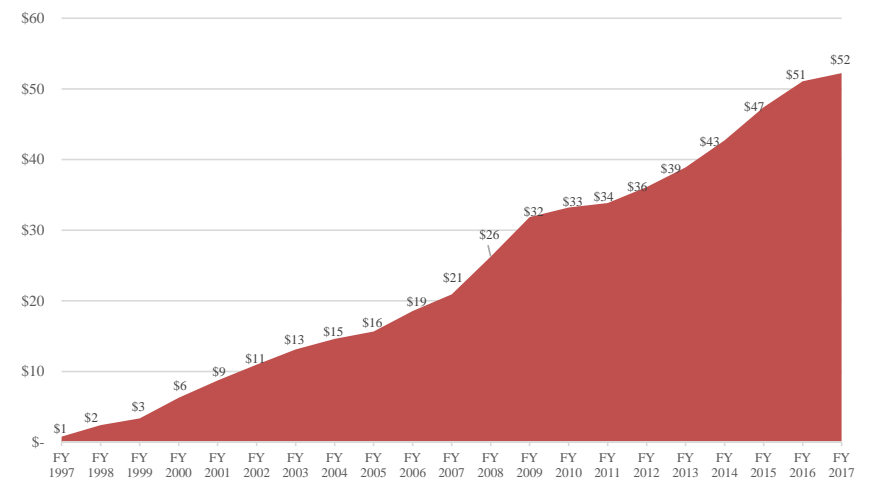
TTUS Total Endowment (in millions)

TTUS Total Endowment



- 700% increase to Total Endowment over the past 20 years
- \$948.66M attributed to generous support from donors and strong investments performance

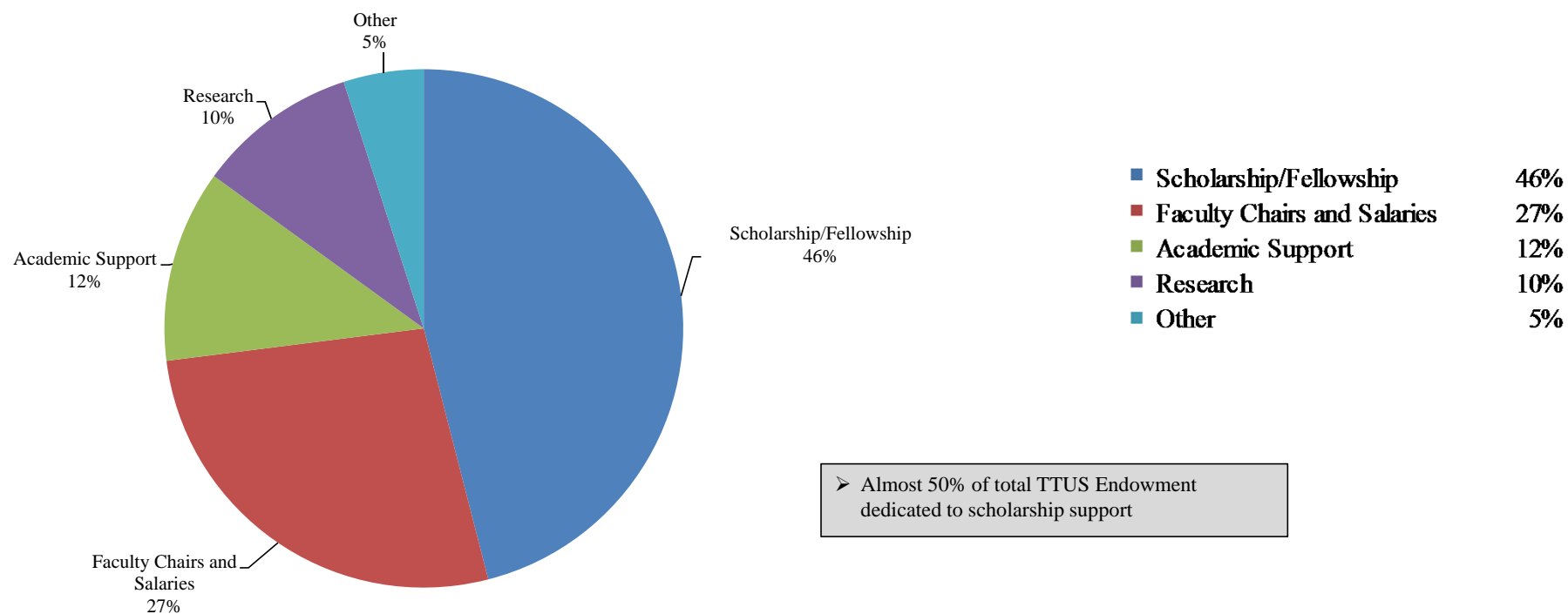
Distributions to TTUS Components



- Over \$509M in total distributions -- >\$52M in FY 2017 alone
- 4.5% Distribution maintained since inception
- Increases in total distributions realized **EVERY** year since inception



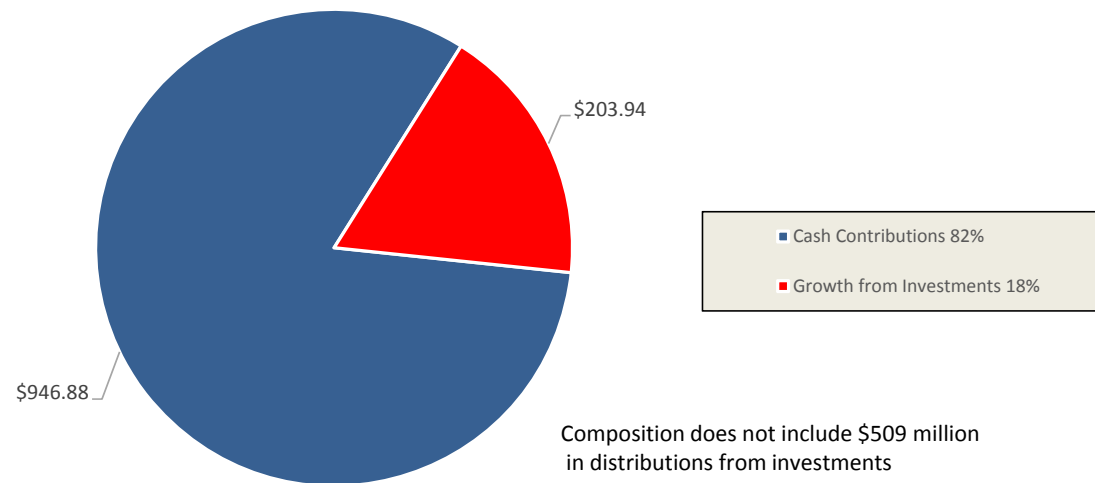
Endowments by Type (as of 8/31/2017)





How Did We Get Here?

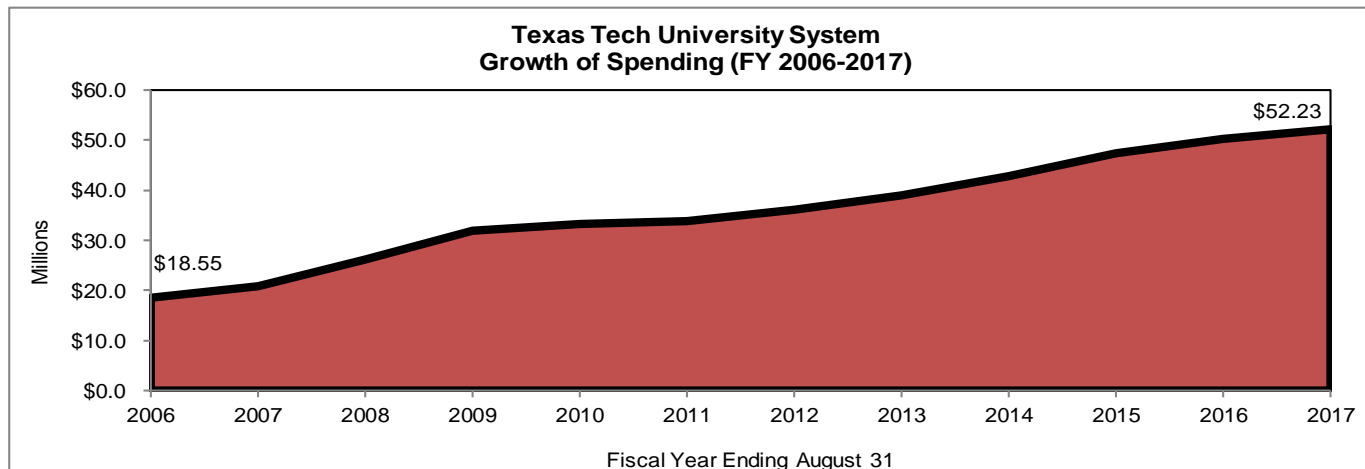
Historical Perspective of Endowment Composition FY 1997-FY 2017 (in millions)





Objective

Provide *consistent, inflation adjusted growth above the spending rate*, resulting in an *increasing revenue stream* for the Regents, Chancellor and Presidents to provide funding for student scholarships and academic chairs.



Cumulative spending since inception of \$509 million

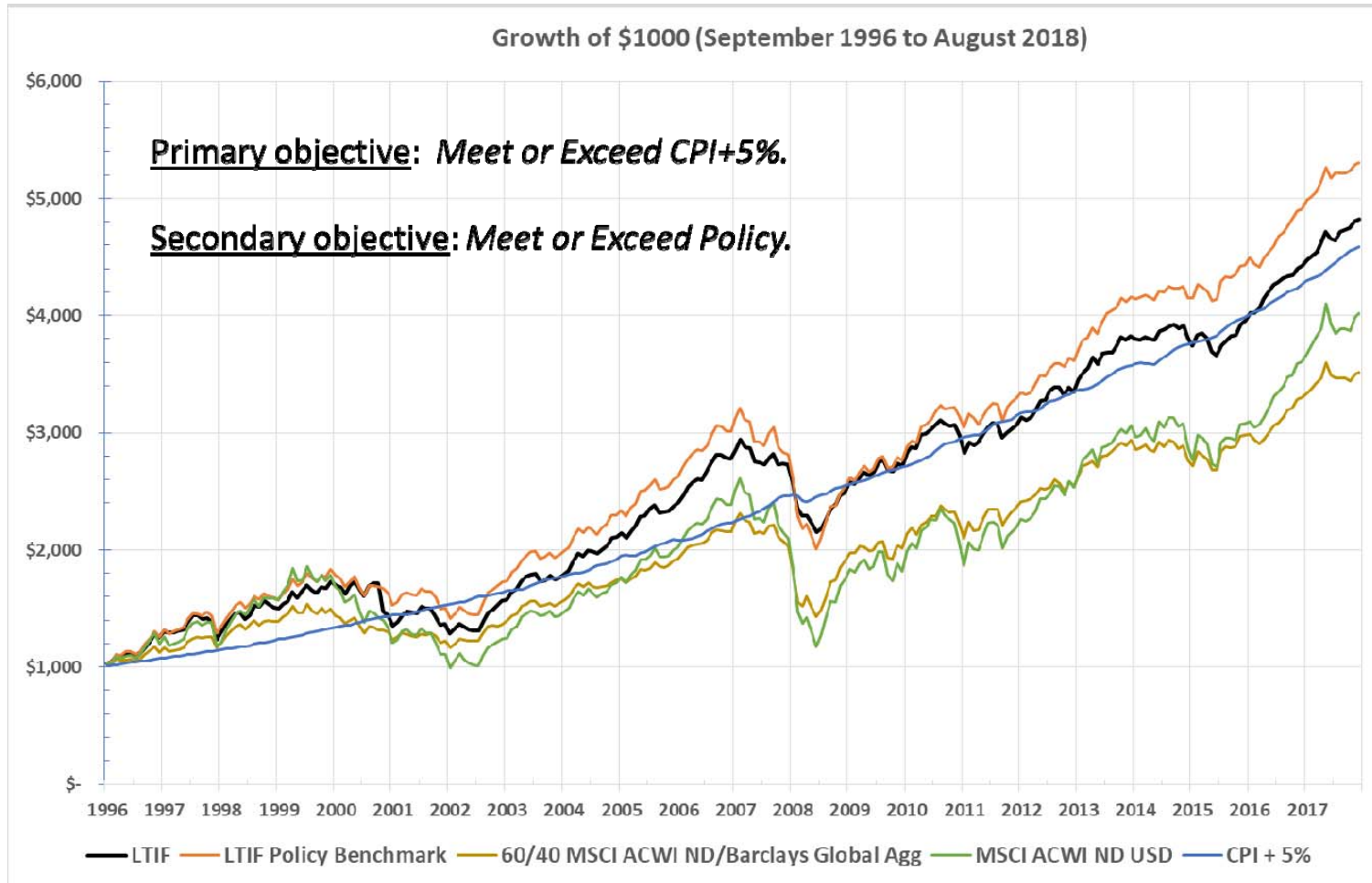


Governance

For Approval of:	CIO	IAC	Board of Regents
Investment Policy Ranges/Targets:	Recommend	Recommend	Approve
Tactical Allocation Ranges/Targets:	Recommend	Approve	Review
Asset Class Structures:	Recommend	Approve	---
Manager Selection & Redemption:	Approve	Review	---



Performance to August 31, 2018





Public Equity Performance

Asset Class	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Public Equity	0.94%	4.12%	4.15%	13.47%	4.12%	13.47%	12.02%	10.11%
Policy: MSCI ACWI	0.83%	3.90%	3.72%	12.00%	3.90%	12.00%	12.08%	9.84%

Period ending August 31, 2018

Key Stats

Public Equity

Number of Managers:	5
Number of Strategies:	6
% Actively Managed	26%
% Overlay	74%



Public Debt Performance

Asset Class	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Public Debt	-0.51%	0.00%	6.81%	7.42%	0.00%	7.42%	10.05%	8.46%
Policy: Barclays Global Agg	0.10%	-0.06%	-1.52%	-1.36%	-0.06%	-1.36%	2.44%	1.34%

Period ending August 31, 2018

Key Stats

Public Debt

Number of Managers:	8
Number of Strategies:	13
% Actively Managed	100%
% Overlay	0%



Public Diversifying Assets Performance

Asset Class	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Diversifying Assets	0.52%	1.54%	4.60%	7.59%	1.54%	7.59%	3.32%	0.44%
Policy: HFRXGL	0.45%	0.30%	-0.55%	1.54%	0.30%	1.54%	4.33%	4.28%

Period ending August 31, 2018

Key Stats

Public Diversifying

Number of Managers:	8
Number of Strategies:	8
% Actively Managed	74%
% Overlay	26%



Private Asset Performance (less liquid)

Portfolio	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Private Investments	0.00%	0.11%	3.70%	8.24%	0.11%	8.24%	6.35%	7.82%
Private Composite	0.00%	2.85%	7.88%	15.60%	0.00%	15.60%	11.75%	12.80%

Portfolio	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Private Equity	0.05%	-0.15%	3.45%	6.60%	-0.15%	6.60%	3.98%	7.38%
Private Credit	0.02%	0.20%	6.14%	9.74%	0.20%	9.74%	7.22%	7.85%
Private Diversifying Assets	-0.08%	0.28%	1.81%	8.35%	0.28%	8.35%	6.94%	7.76%

Period ending August 31, 2018

Key Stats	Private Equity	Private Debt	Private Diversifying
Number of Managers:	15	10	12
Number of Strategies:	19	17	20
% Actively Managed	100%	100%	100%



Total LTIF Performance

Portfolio	MTD	3 Month	Calendar YTD	Fiscal YTD	Nacubo YTD	1 Year	3 Year	5 Year
Total LTIF	0.34%	1.59%	4.45%	9.06%	1.59%	9.06%	8.30%	7.69%
Policy Composite	0.34%	1.20%	3.05%	8.08%	1.20%	8.08%	8.52%	7.99%

Period ending August 31, 2018

Key Stats	Total LTIF
Number of Managers:	59
Number of Strategies:	102
% Actively Managed	75%
% Overlay	25%



Market Returns – Aug 2018

- In the previous section you saw the strong performance of the LTIF
- TTUS benefited by maintaining exposure to undervalued areas like non-US equity

	2010	2011	2012	2013	2014	2015	2016	2017	Q1	Q2	July	Aug	YTD
US Large Cap	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-0.8%	3.4%	3.7%	3.3%	9.9%
US Small/Mid Cap	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-0.2%	5.7%	1.9%	4.3%	12.1%
Int'l Developed Equity	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-1.5%	-1.2%	2.5%	-1.9%	-2.3%
Emerging Market Equity	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	1.4%	-8.0%	2.2%	-2.7%	-7.2%
US Aggregate	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	-1.5%	-0.2%	0.0%	0.6%	-1.0%
US High Yield	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-0.9%	1.0%	1.1%	0.7%	2.0%
US Long Treasuries	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-3.3%	0.3%	-1.5%	1.6%	-2.9%
EM Local Credit	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	4.4%	-10.4%	1.9%	-6.1%	-10.5%
Global Credit	-5.3%	-5.3%	-4.1%	2.7%	-0.6%	3.3%	2.1%	7.4%	1.4%	-2.8%	-0.2%	0.1%	-1.5%
Commodities	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-0.4%	0.4%	-2.1%	-1.8%	-3.9%

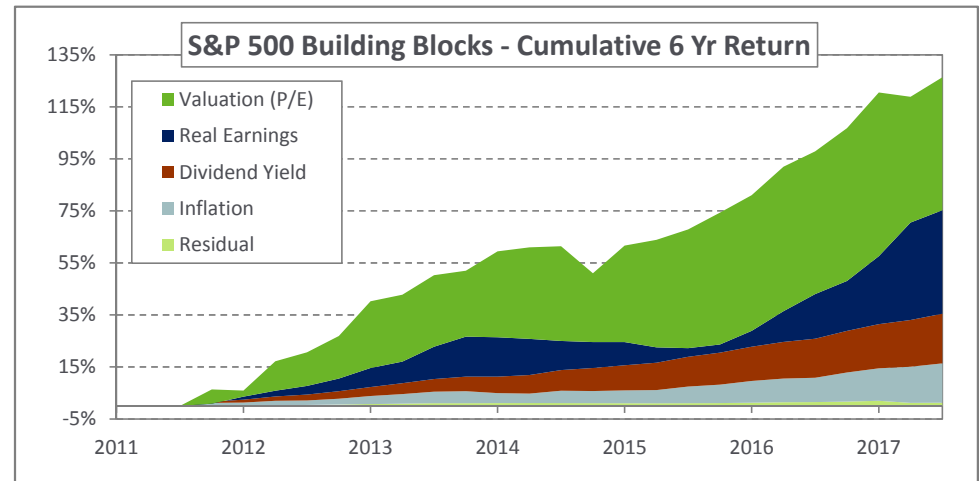
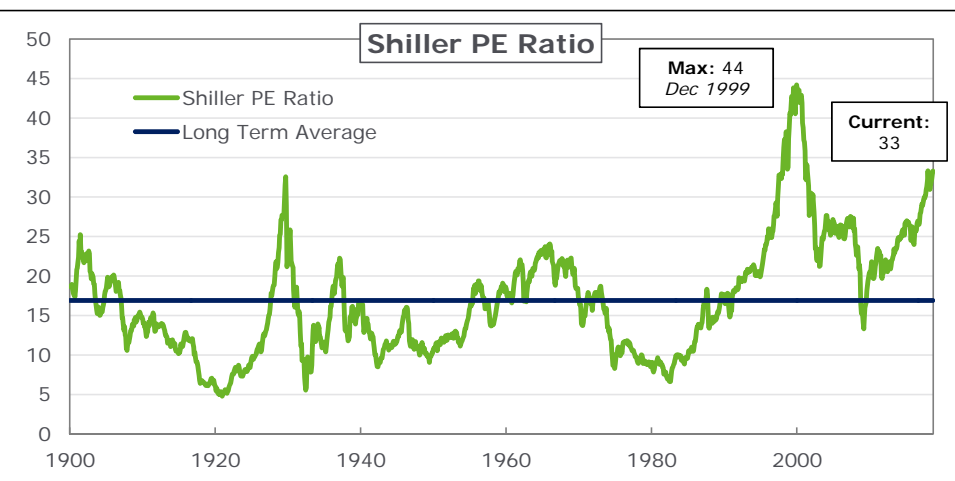
S&P 500 = US Large Cap
 Russell 2500 = US Small/Mid Cap
 MSCI EAFE = International Developed Equity
 MSCI EM = Emerging Market Equity
 Barclays Aggregate = US Aggregate
 Barclays Long Treasury = US Long Treasuries
 Barclays High Yield = US HY
 Barclays Global Aggregate = Global Credit
 GBI-EM Global Diversified = EM Local Credit
 Bloomberg Commodity = Commodities

Source: Bloomberg, Barclays, S&P, Russell, MSCI, JP Morgan, Credit Suisse



Where to Invest: Equities

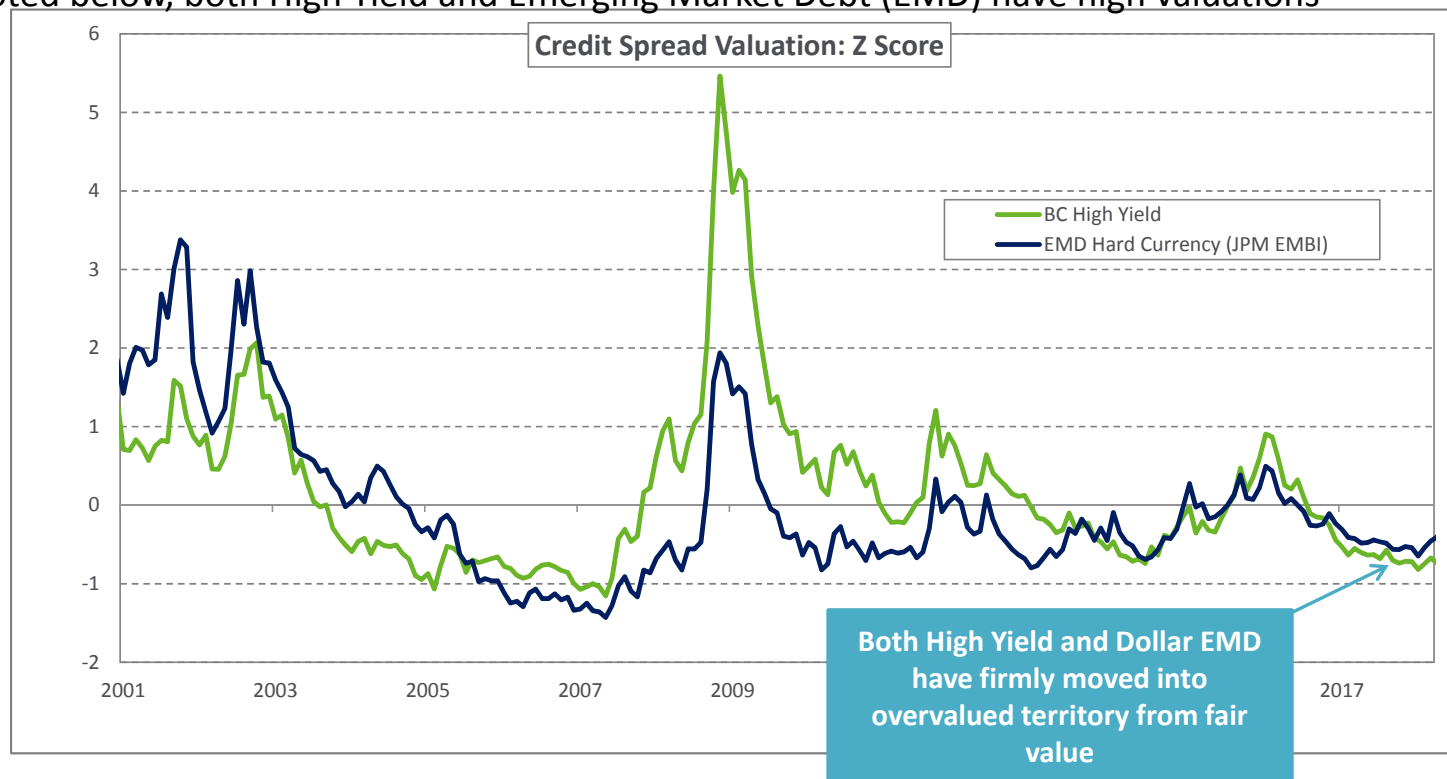
- With equity markets up across the board and the US on its 9th year of a bull market there are few cheap areas for investment
- We show the Shiller PE below as well as the composition of the returns for the S&P 500 over the past 6 years





Where to Invest: Credit

- Equities are not the only asset class that seems expensive
- As noted below, both High Yield and Emerging Market Debt (EMD) have high valuations

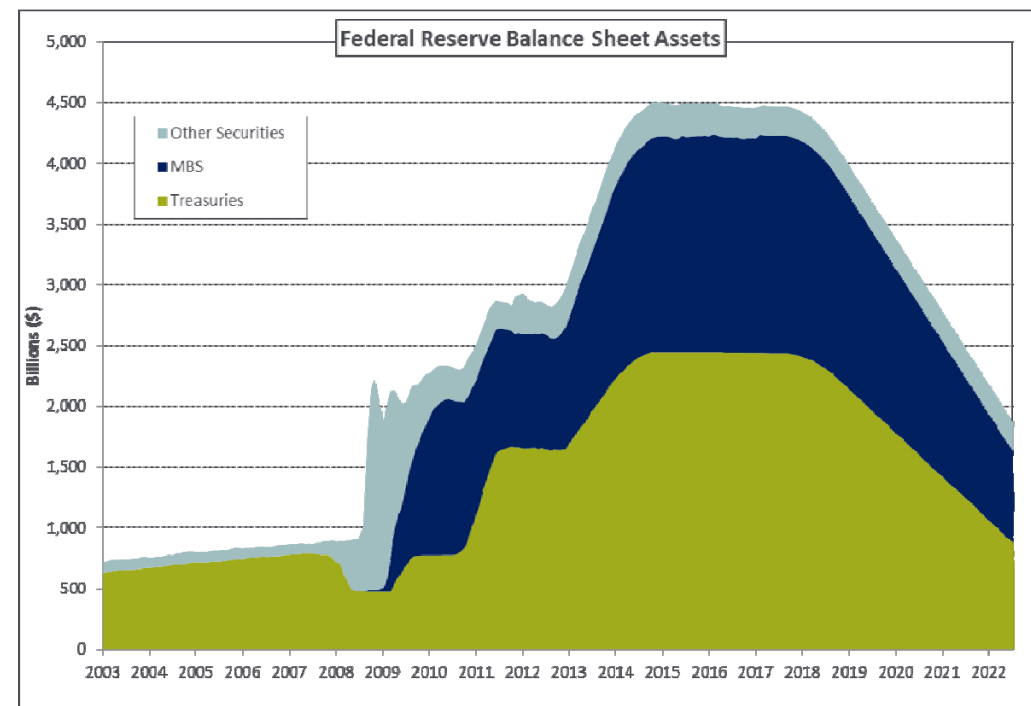
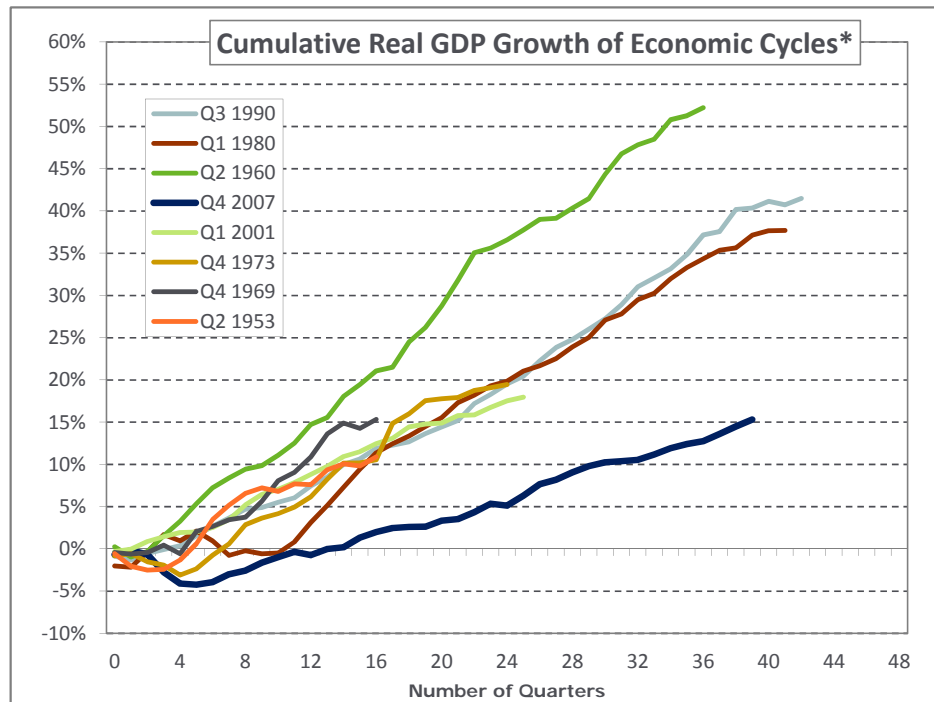


Source: Bloomberg, NEPC



Central Bank Stimulus

- Economic conditions have improved and certainly have helped drive growth
- However, Central Bank stimulus has been a large supporter of returns for risk assets





Looking Forward

- With strong returns over the past number of years, forward looking expectations are lower for most asset classes

5-7 Year Forward Looking Expected Returns	
Asset Class	2018
Cash	2.00%
Treasuries	2.25%
IG Corp Credit	3.50%
Core Bonds	2.75%
TIPS	3.25%
Municipal Bonds	2.50%
High-Yield Bonds	3.75%
Bank Loans	4.50%
Global Bonds (Unhedged)	1.17%
EMD External	4.25%
EMD Local Currency	6.00%
Large Cap Equities	5.25%
Small/Mid Cap Equities	5.75%
Int'l Equities (Unhedged)	7.50%
Emerging Int'l Equities	9.00%
Core Real Estate	5.75%
Commodities	4.75%

Source: NEPC



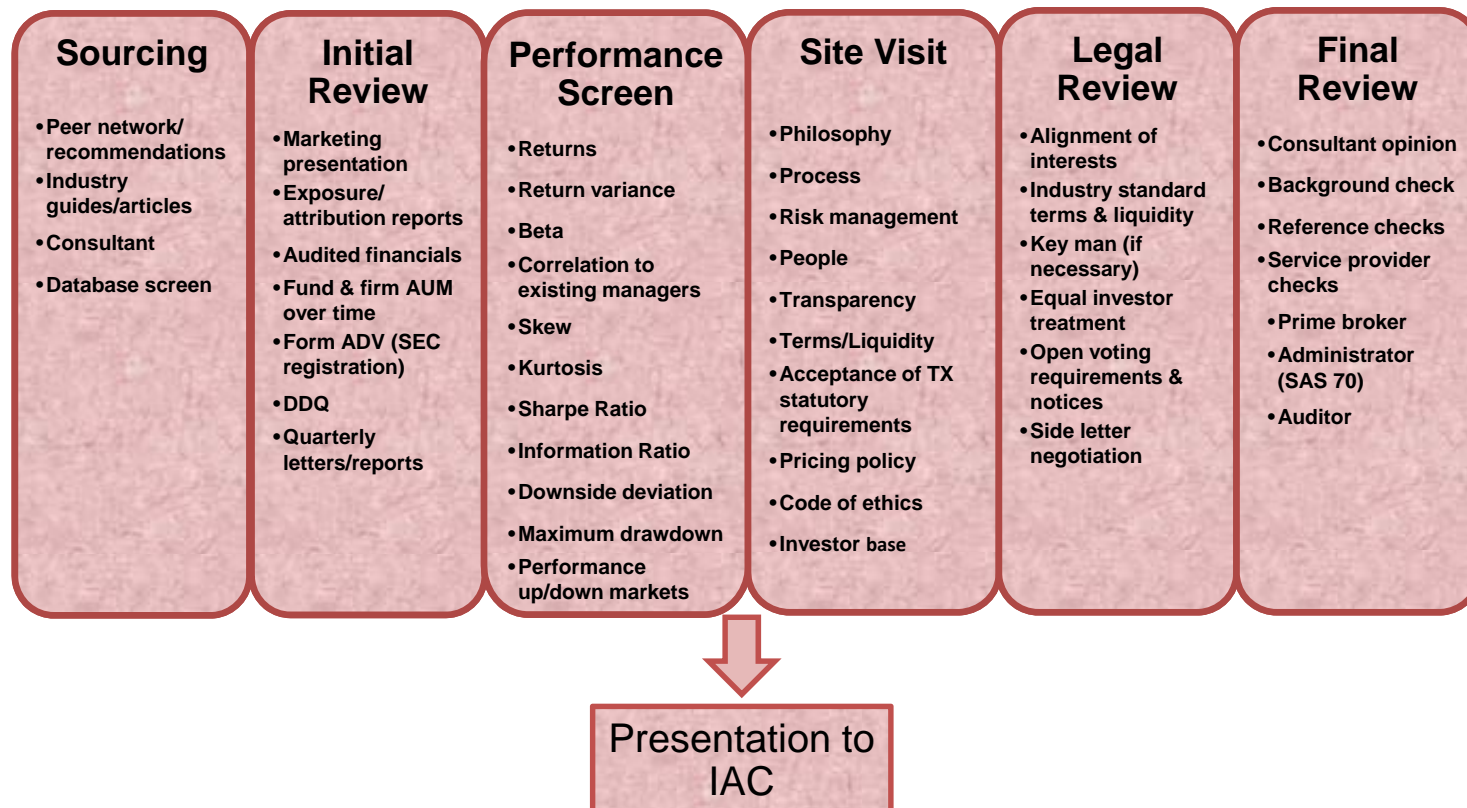
Asset Allocation

The Foundation of Portfolio Construction

	<u>Public (liquid)</u>	<u>Private (less liquid)</u>
Equity	30%	10%
Debt	25%	10%
Diversifying Assets	15%	10%
	25% Alpha Pool	



Due Diligence Flow Chart





Program Drivers

There are two drivers that set the LTIF apart from our peers and have allowed us to consistently improve performance over the last four years.

- Overlay Program: comprises 25% of Assets.
- Master Custody Accounts: comprises 30% of Assets.



Overlay Program

The Beta Overlay and Alpha Pool program, at 25% of the LTIF assets, have consistently added value to our broad market exposures in public equities, public debt and public diversifying assets.

How it works:

1. Purchase S&P 500 Futures Contract giving the LTIF \$10 million of exposure (note: costless transaction).
2. Invest \$8 million in the Alpha Pool.
3. Hold \$2 million in Cash.

The Futures contract gives you the return of the S&P 500.

The Alpha Pool is expected to produce a return of 3-10% annually.

Cash is held to settle daily fluctuations in the futures contract.

Result: Equity market return with a substantially more diversified alpha component than traditional active equity managers relying solely on stock selection skill. Additional ability to add downside protection.



Non US Emerging Markets Overlay Program (May-2014 to Aug-2018)

Over the inception to date, our Non US Emerging Markets Overlay generated a 8.68% return. Adding on the collateral, or alpha pool, that return increases to 12.17% which provides 10.12% in excess return over the MSCI EM benchmark.

Trade/Benchmark	3 Months	1 Year	ITD-Ann.	ITD-Cum.
LTIF Non US EM Equity	-0.65%	4.82%	8.68%	26.59%
LTIF Alpha Pool	0.63%	4.51%	3.49%	10.21%
LTIF Total EM Equity	-0.01%	9.33%	12.17%	36.81%
MSCI EM Equity Benchmark	-4.70%	-0.68%	2.05%	5.91%
LTIF Total Alpha	4.68%	10.01%	10.12%	30.90%

- Over this same time period, leading industry database provider eVestment reported active Emerging Markets managers top quartile results were 5.98%.
- The universes for the database provider are 648, covering virtually all active managers in the space.



Total Overlay Program

(Apr-2014 to Aug-2018)

Is the complexity worth it? Yes.

The total overlay produced a 5.32% return through inception. When coupled with the collateral, or alpha pool, that return jumps to 8.63%. That is 2.80% excess return above the weighted benchmark.

Trade/Benchmark	3 Months	1 Year	ITD-Ann.	ITD-Cum.
LTIF Total Synthetic	2.30%	7.88%	5.32%	25.73%
LTIF Alpha Pool	0.63%	4.51%	3.31%	15.46%
LTIF Total Syn + AP	2.93%	12.39%	8.63%	41.19%
Composite Benchmark	2.44%	8.78%	5.83%	28.43%
LTIF Total Alpha	0.49%	3.61%	2.80%	12.76%



Master Custody Account

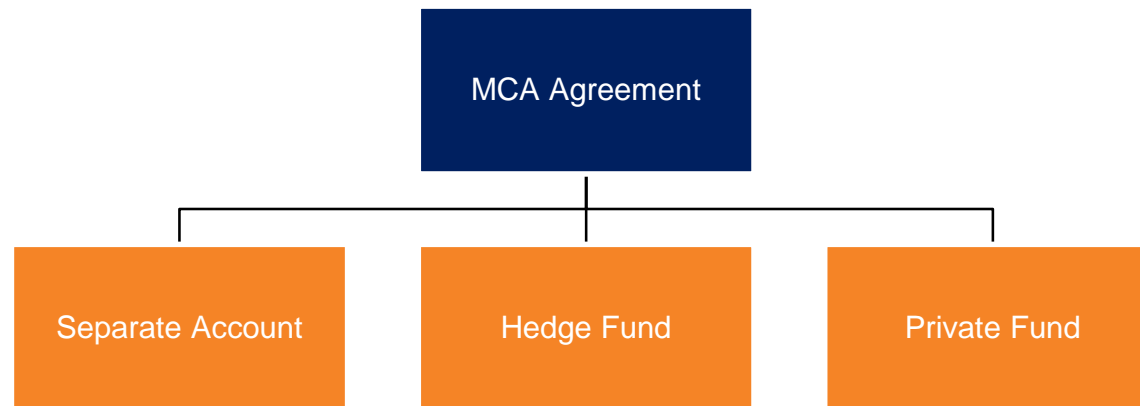
MCA's are strategic partnerships that benefit the manager and client.

Key Attributes:

- Better alignment of interest between the parties.
- Fiduciary standards at relationship versus at the fund level.
- Ability to invest in best ideas through separate accounts.
- Fee savings



Master Custody Account



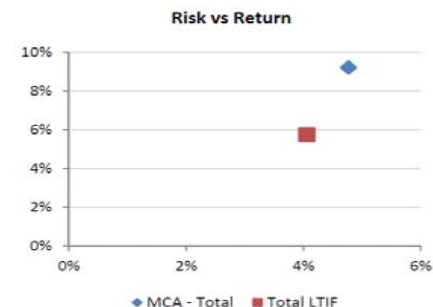
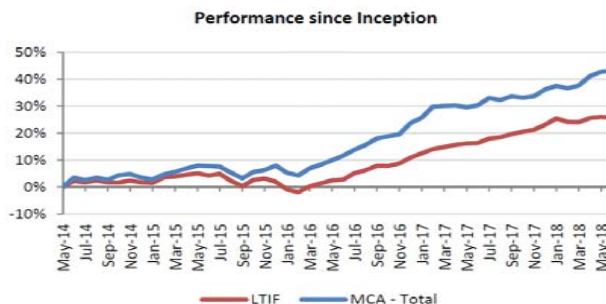
- MCA governs the entire relationship with a manager, making him a fiduciary at the aggregate level.
- Standard fees are paid for the Hedge Fund and Private Fund based on performance quarterly.
- The Separate Account pays no fees quarterly.
- At year end, the net performance of all three accounts is calculated based on a lower relationship level fee, saving the LTIF money.
- In addition to fee savings, the separate accounts allow LTIF staff to invest additional capital in a manager's best ideas.



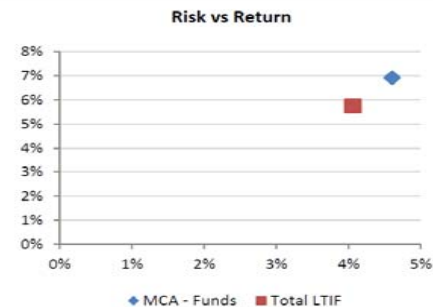
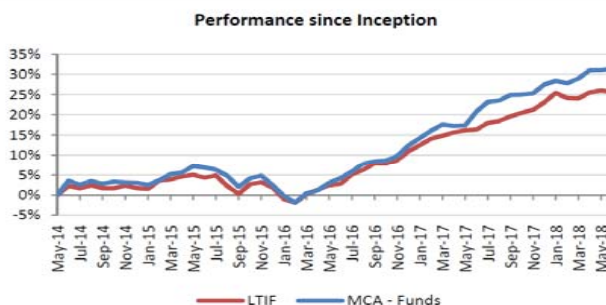
MCA Investment Summary

May-2014 to June-2018

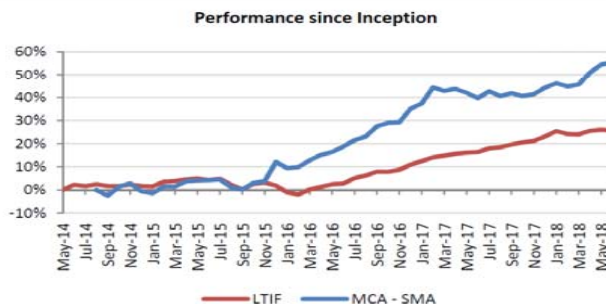
	MCA - Total	Total LTIF
ITD Return	9.21%	5.75%
ITD Volatility	4.77%	4.06%
1yr Return	9.93%	7.99%
P:L Ratio	35 : 14	34 : 15
Best Return	3.48%	2.34%
Worst Return	-2.52%	-2.85%
Sharpe Ratio	1.8180	1.2841
Sortino Ratio	3.5155	1.7653
NAV	431,181,727	1,210,894,295



	MCA - Funds	Total LTIF
ITD Return	6.91%	5.75%
ITD Volatility	4.60%	4.06%
1yr Return	8.76%	7.99%
P:L Ratio	35 : 14	34 : 15
Best Return	3.53%	2.34%
Worst Return	-2.61%	-2.85%
Sharpe Ratio	1.3844	1.2841
Sortino Ratio	2.0958	1.7653
NAV	224,625,733	1,210,894,295



	MCA - SMA	Total LTIF
ITD Return	12.16%	5.75%
ITD Volatility	7.62%	4.06%
1yr Return	11.23%	7.99%
P:L Ratio	33 : 13	34 : 15
Best Return	8.02%	2.34%
Worst Return	-3.29%	-2.85%
Sharpe Ratio	1.5213	1.2841
Sortino Ratio	3.5206	1.7653
NAV	206,555,994	1,210,894,295

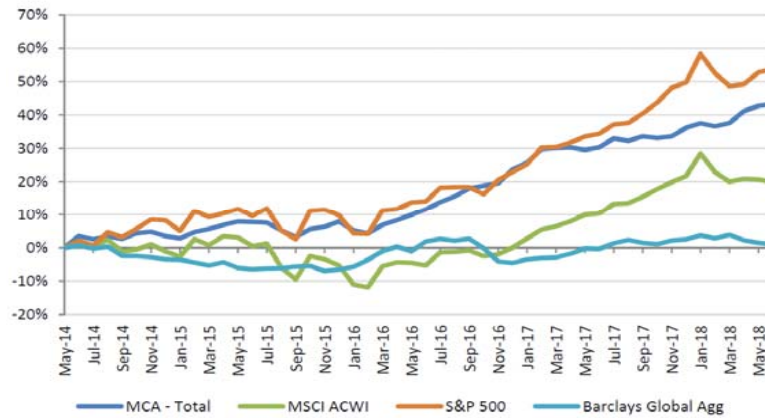




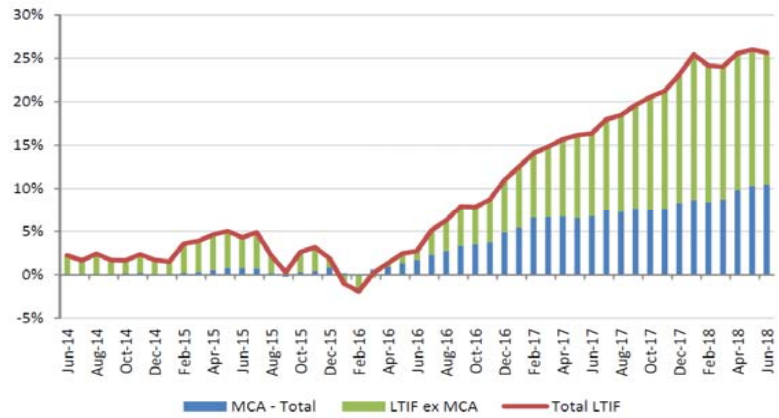
MCA Investment Summary

May-2014 to June-2018

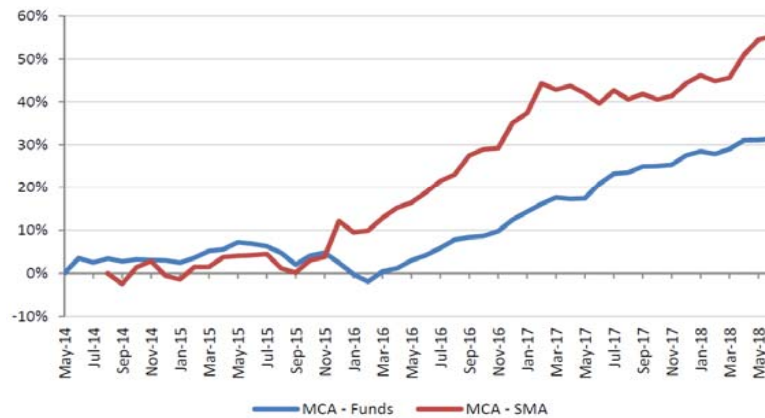
MCA Performance vs Public Markets



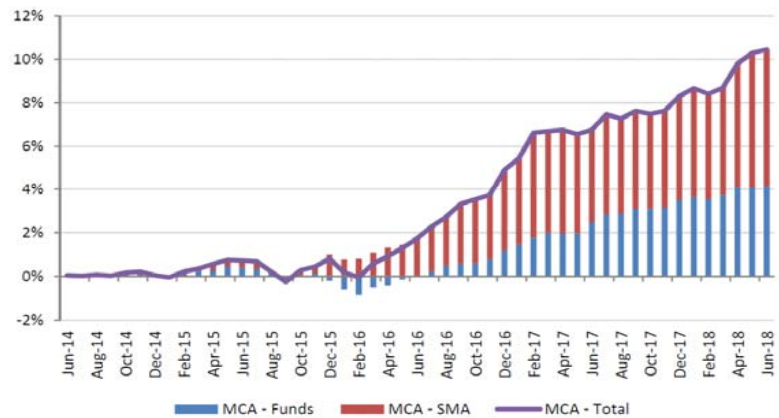
MCA Contribution to Portfolio Performance



Breakdown of MCA Performance



Breakdown of MCA Contribution





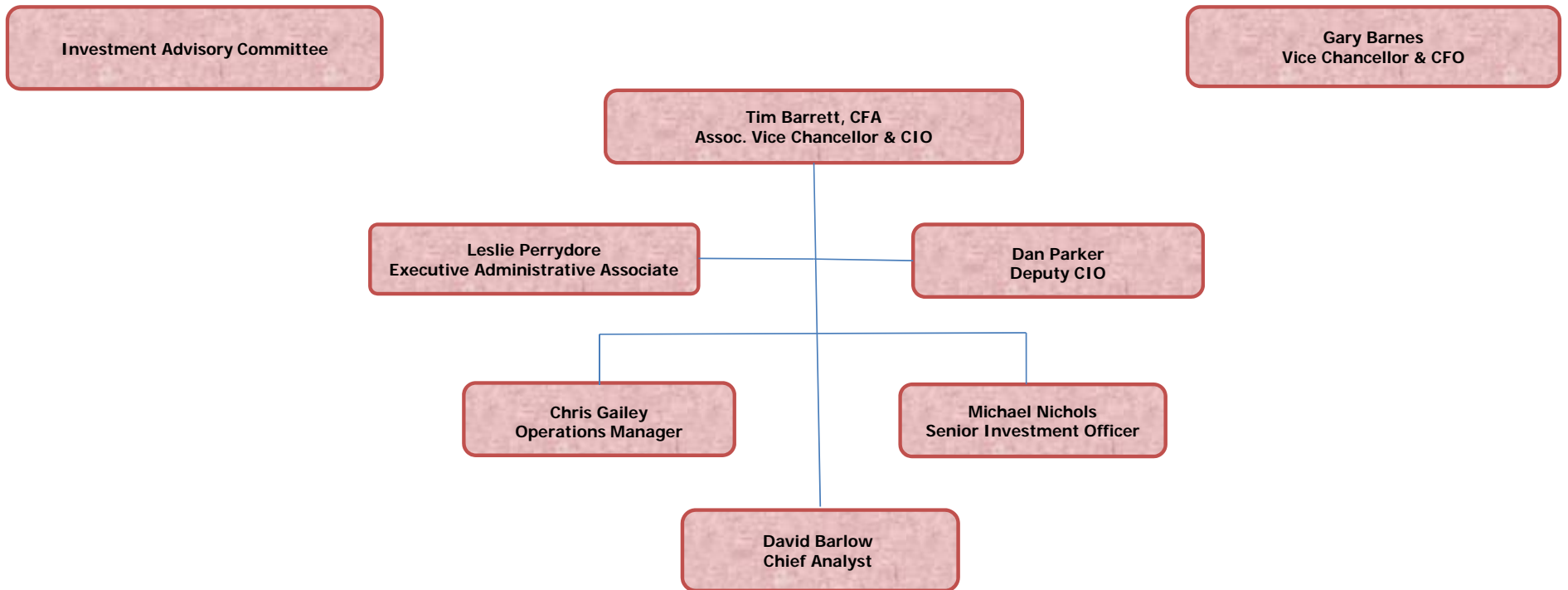
MCA Program Overview

Fee Savings As of 12/31/2017

	Investment Date	Average Allocation	Performance ITD	Performance Annualized %	Management Fee	Performance Fee	Hard Hurdle	Approx. Mgt Fees	Approx. Perf Fees	Approx. Total Fees
Manager 1										
European Credit Opportunities Fund, LP	06/30/2015	10,305,588	19.64%	11.99%	2.00%	20.00%	n/a	323,069	555,005	878,074
European Credit SMA	04/30/2016	18,512,954	72.01%	72.01%	0.00%	0.00%	n/a	0	0	0
Litigation Capital	05/31/2015	6,068,371	10.22%	6.01%	1.50%	20.00%	n/a	144,284	234,531	378,814
Litigation Capital SMA	08/31/2015	2,412,650	67.52%	43.94%	0.00%	0.00%	n/a	0	0	0
Private Credit SMA	08/31/2016	3,684,060	32.52%	32.52%	1.00%	15.00%	n/a	14,670	136,106	150,776
MCA Wrapper	08/31/2016	27,161,277	0.76%	0.76%	1.50%	20.00%	n/a	0	0	0
Savings								482,023	925,642	1,407,664
Manager 2										
Using Standard Terms	09/30/2014	8,168,779	14.83%	6.11%	1.50%	20.00%	n/a	284,517	202,116	486,632
Using Negotiated Terms	09/30/2014	8,168,779	14.83%	6.11%	1.50%	15.00%	5.00%	284,517	44,345	328,861
Savings								0	157,771	157,771
Manager 3										
Fund 3.1 (Standard)	03/31/2015	13,297,689	13.03%	6.91%	0.75%	20.00%	n/a	184,155	160,525	344,680
SMA 3.1 (Negotiated)	03/31/2015	13,519,745	34.33%	17.47%	1.00%	20.00%	5.00%	252,038	664,438	916,476
MCA Wrapper	03/31/2015	26,817,435	23.68%	12.29%	1.00%	15.00%	5.00%	497,579	560,471	1,058,050
Savings								(61,385)	264,492	203,107
Manager 4										
Fund 4.1 (Standard)	11/30/2014	10,058,088	9.97%	4.48%	1.50%	20.00%	n/a	325,642	299,379	625,021
SMA 4.1 (Negotiated)	12/31/2014	11,354,684	2.64%	1.26%	1.00%	15.00%	6.00%	229,461	0	229,461
MCA Wrapper	11/30/2014	20,976,053	7.65%	3.46%	1.00%	15.00%	6.00%	440,889	137,457	578,346
Savings								114,214	161,922	276,136
Manager 5										
Using Standard Terms	02/29/2016	3,362,848	2.83%	2.83%	2.00%	20.00%	n/a	58,456	43,544	102,000
Using Negotiated Terms	02/29/2016	3,352,455	-0.19%	-0.19%	0.00%	0.00%	n/a	0	0	0
Savings								58,456	43,544	102,000
Manager 6										
Using Standard Terms	04/30/2016	4,667,853	14.20%	14.20%	1.50%	15.00%	n/a	50,366	99,091	149,458
Using Negotiated Terms	04/30/2016	4,732,056	26.61%	26.61%	0.00%	0.00%	n/a	0	0	0
Savings								50,366	99,091	149,458
Manager 7										
Using Standard Terms	07/31/2014	20,108,479	27.49%	10.20%	1.75%	20.00%	n/a	867,949	1,383,533	2,251,482
Using Negotiated Terms	07/31/2014	20,106,226	27.12%	10.07%	1.25%	20.00%	6.50%	619,963	1,037,804	1,657,768
Savings								247,985	345,729	593,715
Manager 8										
Using Standard Terms	08/31/2014	32,786,160	27.63%	10.62%	1.50%	20.00%	n/a	1,178,138	2,841,949	4,020,087
Using Negotiated Terms	08/31/2014	32,786,160	27.63%	10.62%	1.00%	20.00%	n/a	785,425	2,769,295	3,554,720
Savings								392,713	72,655	465,367
Total		102,755,484	27.95%	10.36%				1,284,372	2,070,846	3,355,217



Staff Organization Chart





Staff Bios

Name	Title	Responsibilities	Educational Qualifications	Professional Qualifications	Years of Experience
Tim Barrett	Associate Vice Chancellor & Chief Investment Officer	Hired in 2013. Responsibilities include investment oversight for \$1 billion total return pool of endowments. Work with the IAC to set risk profile, benchmarks and asset allocation; supervises the team's identification of external investment managers. Prior experience includes serving as CIO for a large public pension and a large corporate pension.	BS - University of Montana MSBA - San Diego State University	CFA	22
Dan Parker	Deputy CIO	Hired in 2016. He shares broad responsibility across the portfolio and focuses on public and private equity, real assets and hedge funds. Prior experience includes a large endowment, a top-tier asset manager and bulge-bracket investment banking.	BA - Tulane University MBA - William & Mary		19
Michael Nichols	Senior Investment Officer	Hired in 2010. Responsibilities include credit investments and derivatives as well as hedge funds. Prior experience includes software and electrical engineering.	BS - University of Texas in Dallas Masters - Texas Tech University	CAIA	8
Chris Gailey	Operations Manager	Hired in 2003. Oversees all aspects of cash management, contracting and administration of the LTIF, including Operational Due Diligence, relationships with custodian, consultant, performance reporting and legal counsel.	BA - Texas Tech University		19
David Barlow	Chief Analyst	Hired in 2012. Performs analysis and due diligence on current and prospective investments. Assists in monitoring investments across public and private equity and private real assets. Maintains many of the back office processes.	BA - University of Texas in Austin Masters - University of North Texas	CAIA	6
Leslie Perrydore	Executive Administrative Associate	Hired in 2014. Provides executive and administrative assistance to the Chief Investment Officer and the Office of Investments to ensure the smooth operation and functioning of the office.			13

Appendix



Investment Operations

Investment Operations consist of all aspects of the back and middle office activities. This includes all accounting and cash movements, reporting, Operational Due Diligence (ODD), legal reviews, contracting and MCA account structuring.

The following were completed in fiscal year 2018

- Completed and audited 498 cash transactions within the portfolio.
- All transactions represent more than \$850 million. These include all fundings, redemptions, calls, distributions, additions and spending.
- Completed full due diligence and legal reviews on 10 firms, which resulted in 8 that were executed and hired.
- 5 Managed Custody Accounts (MCA) were negotiated and set up with accounting and reporting structures.
- Fully implemented a cloud based document management and performance tracking software platform.



Historical Ranking vs. Peers

TTUS NACUBO Percentile Ranking - 750M-1.5B				
	1 Year	3 Year	5 Year	10 Year
2017	51.5%	65.6% ↑	81.3% ↑	62.9% ↑
2016	50.8% ↑	74.6% ↑	88.1% ↑	66.0%
2015	63.1% ↑	74.6% ↑	92.3% ↑	42.9%
2014	68.8% ↑	84.1% ↑	93.7%	29.3% ↑
2013	77.4%	100.0%	76.9%	45.1%

TTUS NACUBO Percentile Ranking - All E&F				
	1 Year	3 Year	5 Year	10 Year
2017	47.6%	47.1% ↑	64.5% ↑	53.1% ↑
2016	43.8% ↑	59.6% ↑	72.1% ↑	54.9%
2015	52.3% ↑	68.4% ↑	90.6%	32.6%
2014	66.0% ↑	80.8% ↑	89.2%	18.6% ↑
2013	68.6%	96.8%	84.5%	28.5%

↑ IMPROVED RANKING

- 3-year rankings have improved from bottom to third quartile.
- We have achieved consistent improvement in our *three, five and ten year performance rankings*, improving by 9% and 12.5% over the last three year rankings in the “All E&F and “\$750m-\$1B peer universe