



TEACHERS' RETIREMENT SYSTEM

of the State of Kentucky

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Education Commissioner

GARY L. HARBIN, CPA
Executive Secretary

Special Meeting of the

TRS Board of Trustees

AGENDA

Monday, November 20, 2017

8:30	Continental Breakfast	
9	Introduction and Basic Retirement Concepts	Gary Harbin
9:45	Investing: Professional vs Individual And Pensions vs 401(k)	Gary Harbin Tom Siderewicz
10:30	Break	
10:45	Ethics	Beau Barnes
11:15	Actuarial Standards and Practices	Ed Koebel Cavanaugh Macdonald Consulting
12	Lunch-open discussion of actuarial concepts	Gary Harbin
1	Investment Best Practices	PJ Kelly Aon Hewitt Investment Consulting
2	Financial Concepts	Michelle Deans Mountjoy Chilton Medley
2:45	Break	
3	Economic Outlook	Curt Scott Todd Asset Management
4	Open discussion of administrative operations	Gary Harbin

The meeting will take place at the Kentucky History Center
100 West Broadway, Frankfort, Kentucky.

DEFINED BENEFIT VS. DEFINED CONTRIBUTION

Analysis of Investment Fees and Performance

TRS INVESTMENT FEES

- ▶ TRS pension administrative fees of 0.05%
- ▶ TRS pension investment fees 0.28%
- ▶ 2011 Study by Deloitte found average admin fees of DC plan 0.72%
- ▶ Ohio STRS administrative Fee 0.1%
- ▶ Ohio STRS investment fees 0.34%

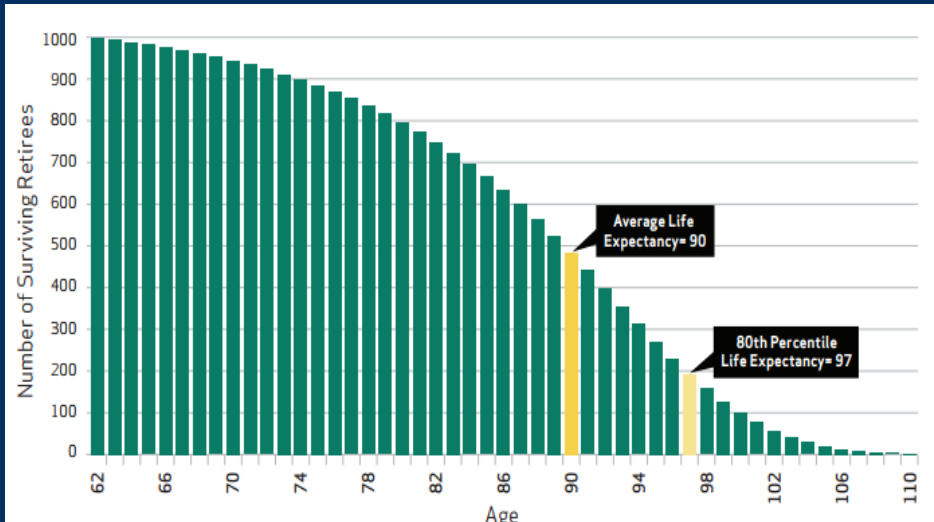


Defined Benefit Advantage

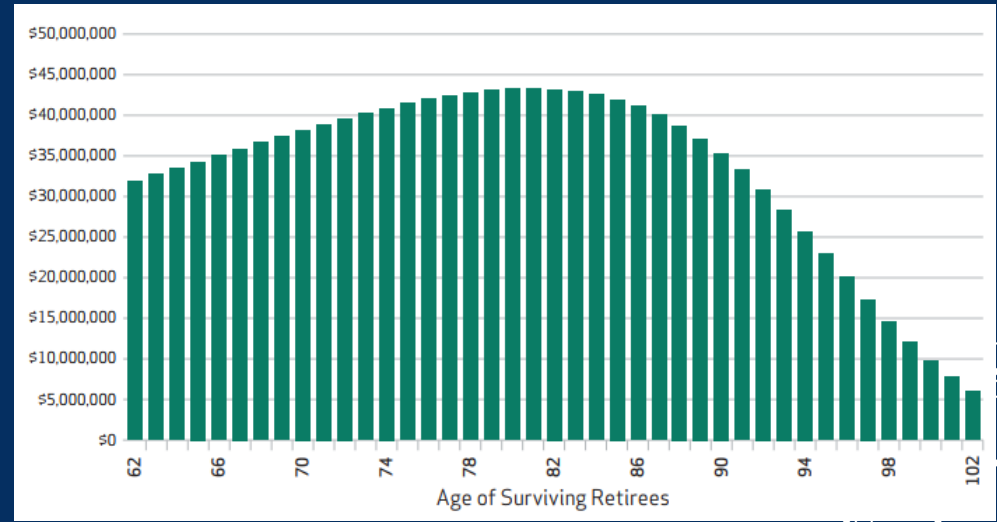
- ▶ Defined Benefit Plans conservatively have a **48% cost advantage** some reports show it at as high as **91%**:
 - ▶ 1. Longevity Risk 10% - Must accumulate enough so as to not outlive one's assets
 - ▶ 2. Asset Allocation 11% - Defined Contribution must shift away from risk with age, Private Equity, Individual Bonds
 - ▶ 3. Low Fees and Professional Management 27% - Economies of scale, low administration fees, superior returns



LONGEVITY RISK



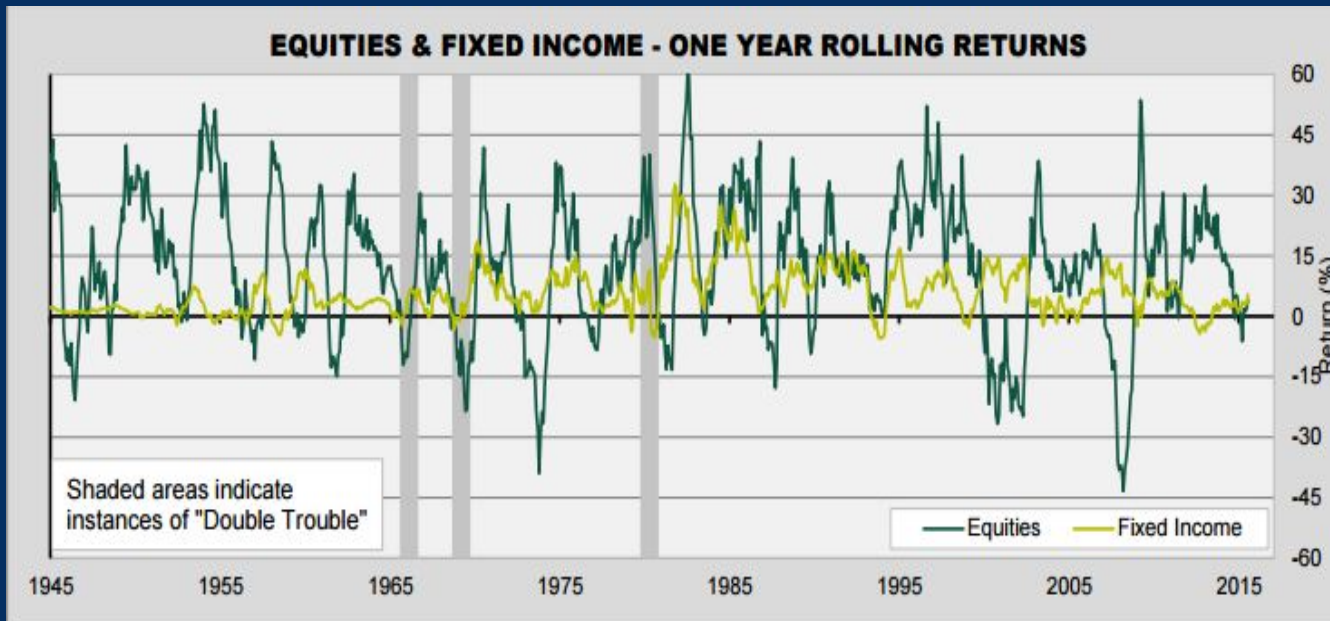
Longevity of 1,000 Female Teachers



Total Payments Under Defined Benefit Plan

Payments under a Defined Contribution Plan would stop when participants run out of money.

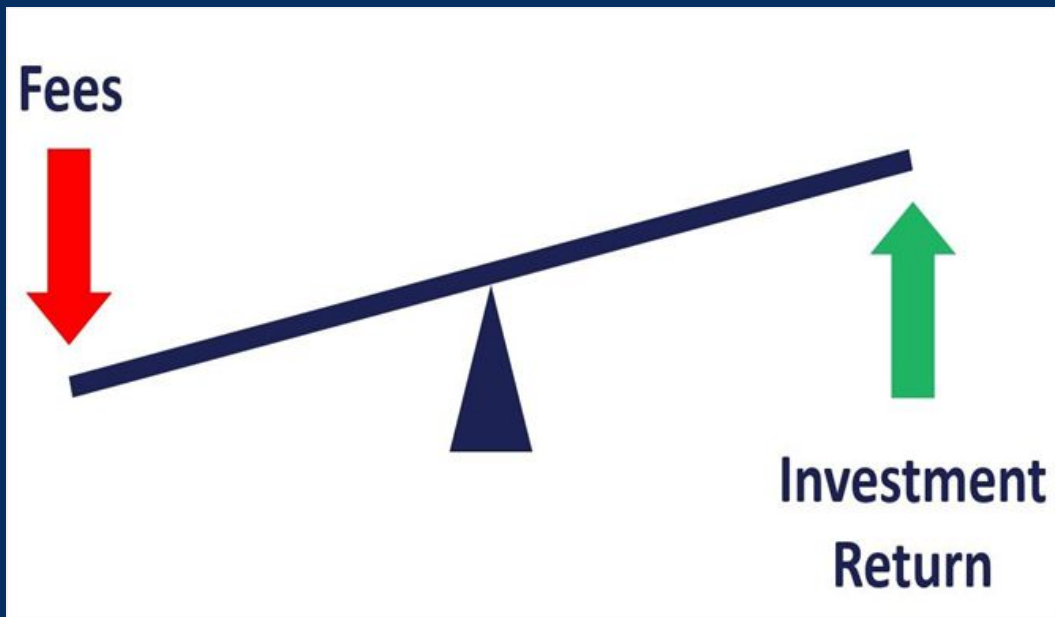
ASSET ALLOCATION



Source: Northern Trust, Ibbotson. Index proxies: Ibbotson Associates Stocks, Bonds, Bills and Inflation (IA SBBI) U.S. Large Stocks Total Return for equities and IA SBBI U.S. Intermediate Government Total Return for fixed income.

Stocks have outperformed bonds 53 out of the last 85 years

FEES AND MANAGEMENT

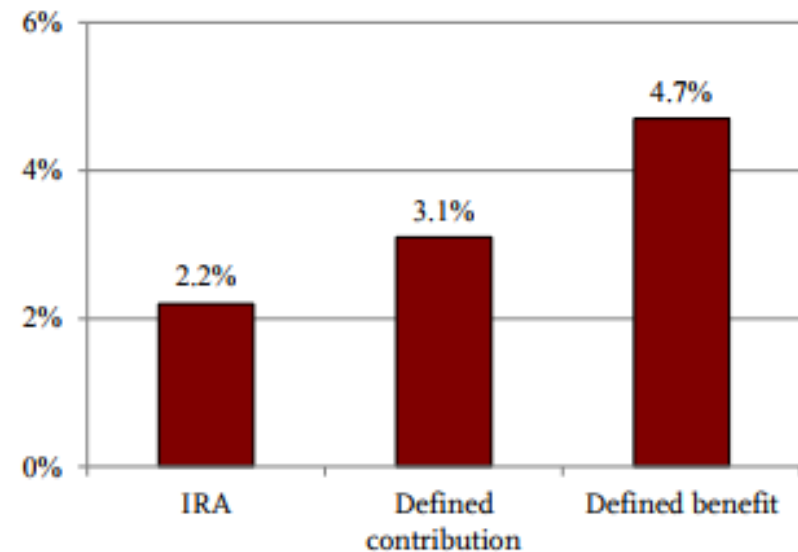


- ▶ 1% yearly advantage to Defined Benefit Plan
- ▶ 0.40% attributed to fees
- ▶ 0.60 % Investment Management

INVESTMENT PERFORMANCE

- ▶ Defined Benefit Plans consistently performs higher than Defined Contribution Plans and Individual Retirement Accounts
- ▶ Investment personnel vs. uneducated investor
- ▶ Source: Boston College Center for Retirement Research study

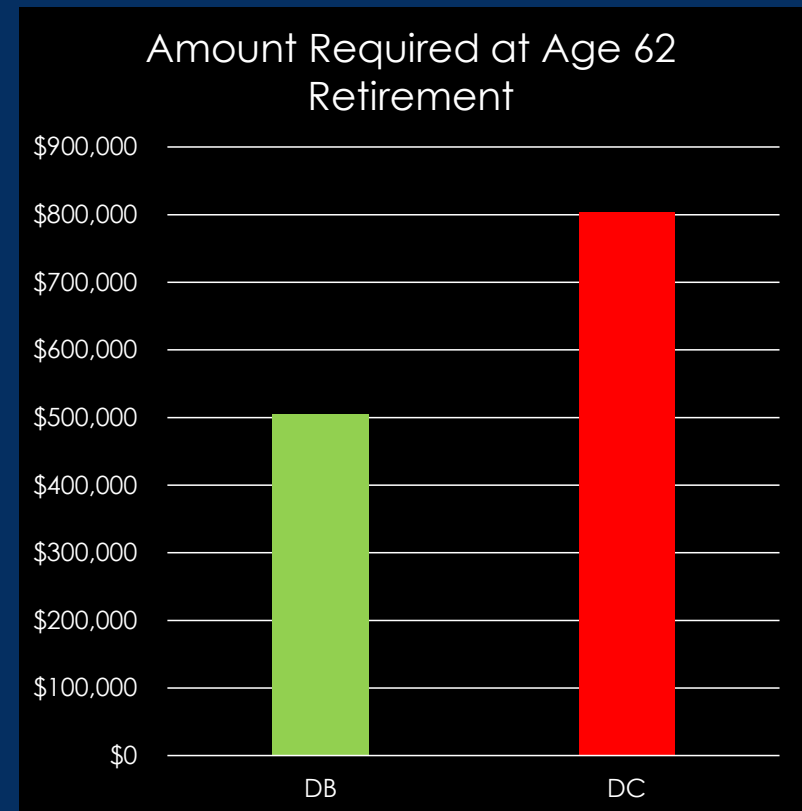
FIGURE 4. GEOMETRIC RATES OF RETURN BY PLAN TYPE, 2000-2012



Source: Authors' calculations based on Investment Company Institute (2015b) data and Form 5500 (2000-2012).

FUNDING DEFINED BENEFIT VS. DC

- ▶ Same level of benefits to replace 53% of final salary results in drastic differences
- ▶ 16.3% of payroll to fund Defined Benefit Plans
- ▶ 31.3% of payroll to fund Defined Contribution Plans
- ▶ Additional \$300,000 needed in a Defined Contribution Plan for same level of benefits



THREE LEVELS OF DEFINED CONTRIBUTION FEES

Average estimates from 0.72% to 0.95%

- ▶ 1. Investment Fees - No ability to negotiate, no pooled asset benefits, fiduciaries of the plans are not required to find the cheapest plan
- ▶ 2. Individual Service Fees - Fees for the bookkeeping of individualized participants
- ▶ 3. Administrative Fees - passed directly to participant
 - ▶ Example: New York



Investment Option (listed from Tier 1 to Tier 4 as in the Tiered Spectrum) <i>All data as of June 30, 2017</i>	Mutual Fund Company Annual Expense as % of Assets ¹	Administrative Cost as % of Assets ²	Total Participant Cost as % of Assets (Annually)	Total Participant Cost per \$1,000* (Annually)
Tier 1 – Target Date Funds, Balanced Fund				
Vanguard Target Retirement Income Fund (Instl) ³	0.09	0.32	0.41	\$4.10
Vanguard Target Retirement 2015 Fund (Instl) ³	0.09	0.32	0.41	\$4.10
Vanguard Target Retirement 2020 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2025 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2030 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2035 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2040 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2045 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2050 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2055 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Target Retirement 2060 Fund (Instl) ³	0.10	0.32	0.42	\$4.20
Vanguard Wellington Fund (Admiral)	0.16	0.32	0.48	\$4.80
Tier 2 – Passively Managed Index Funds				
Vanguard Inflation-Protected Securities Fund (Instl)	0.07	0.32	0.39	\$3.90
Vanguard Total Bond Market Index Fund (Instl)	0.04	0.32	0.36	\$3.60
Vanguard Institutional Index Fund (Instl)	0.04	0.32	0.36	\$3.60
Vanguard Mid-Cap Index Fund (Instl)	0.05	0.32	0.37	\$3.70
Vanguard Small-Cap Index Fund (Instl)	0.05	0.32	0.37	\$3.70
Vanguard Total International Stock Index Fund (Admiral)	0.11	0.32	0.43	\$4.30
Tier 3 – Actively Managed Funds				
Invesco Short Term Investments Government & Agency Portfolio (Instl)	0.15	0.32	0.47	\$4.70
MetWest Total Return Fund	0.38	0.32	0.70	\$7.00
PIMCO All Asset Fund (Instl)	1.07	0.32	1.39	\$13.90
T. Rowe Price Institutional Mid-Cap Equity Growth Fund	0.61	0.32	0.93	\$9.30
AMG GW&K Small Cap Equity Fund (Instl)	0.96	0.32	1.28	\$12.80
Dodge & Cox International Fund	0.64	0.32	0.96	\$9.60
Tier 4 – Specialty Funds				
Fixed Contract Fund 3 ⁴	0.36	0.32	0.68	\$6.80
Franklin High Income Fund (R6)	0.48	0.32	0.80	\$8.00
Fidelity Contrafund	0.68	0.32	1.00	\$10.00
Fidelity Growth Company Fund	0.77	0.32	1.09	\$10.90
American Funds EuroPacific Growth Fund (R6)	0.50	0.32	0.82	\$8.20
DFA International Small Company Fund (I)	0.53	0.32	0.85	\$8.50
Aberdeen Emerging Markets Institutional Fund	1.12	0.32	1.44	\$14.40

Kentucky Deferred Comp

- Individual Service Fee of \$1 per month
- Administrative fee of 0.32%
- Investment Fees vary
- Fees range from 0.41% to 1.44%

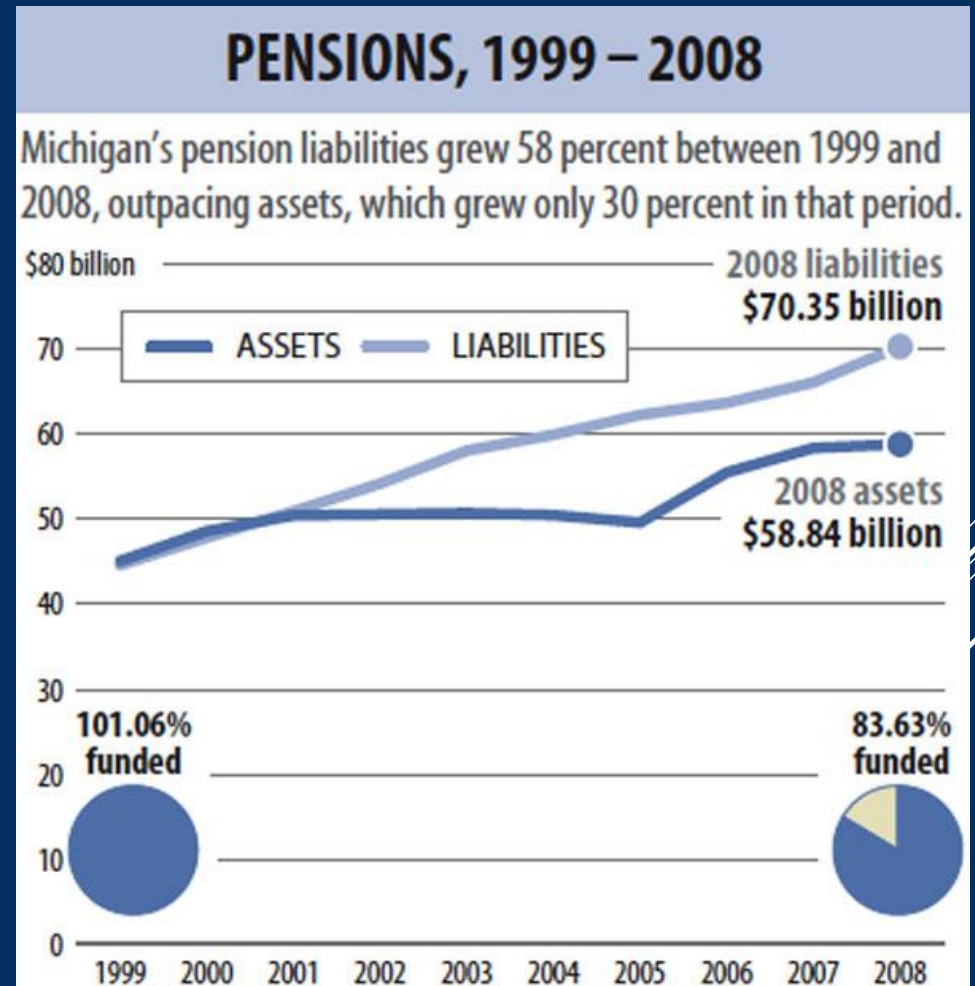
ALASKA



- ▶ Moved to Defined Contribution Plan for new hires 2006
- ▶ Unfunded liability more than doubled after switching
- ▶ Defined Contribution Plan fees:
 - ▶ 0.11% monthly Administration Fee (1.32% annually)
 - ▶ \$35 annual service fee for contributing members, \$25 non-contributing
 - ▶ Investment Fee - Varies, International Equity Fund 0.42%

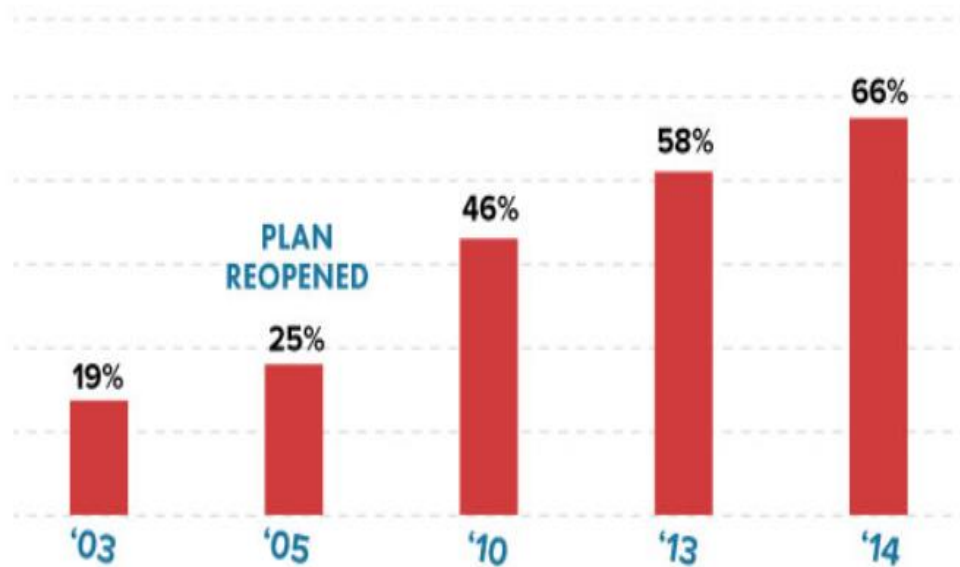
MICHIGAN

- ▶ Switched from Defined Benefit Plan to Defined Contribution Plan to save money
- ▶ 1997 Closed Defined Benefit moved to Defined Contribution was 109% funded
- ▶ Costs skyrocketed, one year alone 2012-2013 unfunded liability grew by \$71.6 million even with 12.5% return
- ▶ Reduced retirement security
- ▶ Source: The PEW Charitable Trusts



WEST VIRGINIA

WEST VIRGINIA TRS PLAN FUNDING LEVELS



West Virginia Comprehensive Consolidated Public Retirement Board Annual Financial Reports

West Virginia closed its pension plan for teachers and switched to a 401(k) in 1991. What happened next?

- *The pension plan funding level fell to 25%*
- *Teachers were unprepared for retirement*
- *The pension was reopened 14 years later*

Teachers' Retirement System

BOARD OF TRUSTEES

Fiduciaries of TRS



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Chair, Hodgenville



ALISON WRIGHT
Vice Chair, Georgetown



MARY ADAMS
Brodhead



ALLISON BALL
State Treasurer



JOHN BOARDMAN
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JOSH UNDERWOOD
Tollesboro

Information on the TRS

Fiduciary and Ethics Overview



Presented by

Beau Barnes

Deputy Executive Secretary
Operations and General Counsel

Nov. 20, 2017

I. The Role of the Fiduciary

TRS Board Members are Fiduciaries

What is a Fiduciary?

Fiduciary: “The term is derived from the Roman law, and means a person holding the character of a trustee, or a character analogous to that of a trustee, in respect to the trust and confidence involved in it and the scrupulous good faith and candor which it requires. A person having a duty, created by his or her undertaking, to act primarily for another’s benefit in matters connected with such an undertaking... A person who manages money or property for another and who must exercise a standard of care in such management activity imposed by law or contract. A trustee, for example, possesses a fiduciary responsibility to the beneficiaries of the trust to follow the terms of the trust and the requirements applicable to state law.”

Trustee: “Person holding property in trust. The person appointed, or required by law, to execute a trust: one in whom an estate, interest, or power is vested, under an express or implied agreement to administer or exercise it for the benefit or the use of another.”

Black’s Law Dictionary, Fifth Edition (1979)

Common and Case Law Guidelines

“The first duty of a trustee is the duty of loyalty.” Bryan, et al. v. Security Trust Co., Ky., 176 S.w.2d 104 (1943).

“He [a trustee] owes the duty of utmost fidelity and loyalty to the beneficiary...” Hutchings, et al. v. Louisville Trust Company, Ky., 276 S.W.2d 461 (1954).

General Conduct

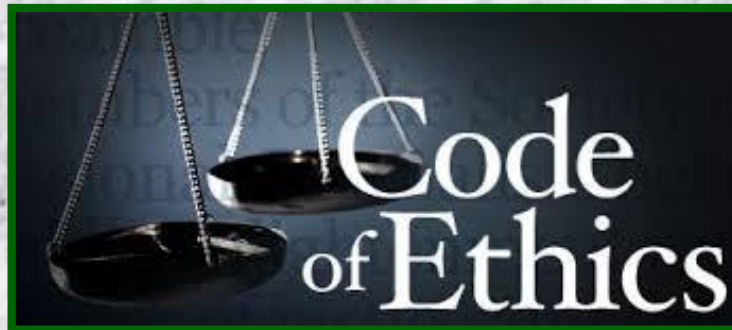
1. Undivided Loyalty — Trustees must discharge duties solely in interest of plan participants and beneficiaries and for exclusive purpose of providing benefits to participants and beneficiaries. Trustees should avoid any conflict of interest in which the trustee's interests conflict with interests of plan participants and beneficiaries.
2. Honesty and Duty of Full Disclosure — Trustees must disclose any material fact that could influence in any way the trustee's decisions, actions or willingness to make decisions or to take action. Abstain from votes where trustee has a conflict.
3. Avoiding Appearance of Impropriety — Lexington-Herald Leader / Courier-Journal test.
4. Due Care — The standard is, "What would a prudent public pension plan trustee do?"

Specific Duties Owed to Plan Participants and Beneficiaries

1. Providing plan participants and beneficiaries with due process.
2. Informing plan participants and beneficiaries about the plan. Summary plan description, newsletters and website.
3. Protecting the fund. Preventing incursions into fund for other political objectives. Requesting actuarially sound contributions to fund. Requiring and collecting contributions when due.
4. Having up-to-date investment policies and engaging qualified investment managers. Establishment of performance benchmarks and review by independent consultant. Diversifying investment portfolio so as to minimize risk. Investments should be made with only benefit of plan participants and beneficiaries in mind. Trustees do not have to be investment experts — they do need to feel assured that they have employed competent investment staff and managers with adequate checks and safeguards in place.

II.

Executive Branch



Executive Branch Code of Ethics

Statement of Public Policy

The public policy of the Commonwealth requires that:

- A public servant must be independent and impartial;
- Decisions and policies must be made through the established processes of government;
- A public servant should not use public office to obtain private benefits; and
- The public has confidence in the integrity of its government and public servants.

Source: KRS 11A.050



Executive Branch Code of Ethics

Prohibited Conflicts of Interest

No public servant, by himself or through others, shall knowingly:

- Use or attempt to use his or her influence in any matter which involves a substantial conflict between his or her personal or private interest and his or her duties in the public interest;
- Use or attempt to use any means to influence a public agency in derogation of the state at large;
- Use his or her official position or office to obtain financial gain for him or herself or any members of the public servant's family; or
- Use or attempt to use his or her official position to secure or create privileges, exemptions, advantages, or treatment for him or herself or others in derogation of the public interest at large.

If a public servant appears before a state agency, he or she shall avoid all conduct which might in any way lead members of the general public to conclude that the public servant is using his or her official position to further his or her professional or private interest.

When a public servant abstains from action on an official decision in which the public servant may have a personal or private interest, he or she shall disclose that fact in writing to his superior, who shall cause the decision on these matters to be made by an impartial third party.

Source: KRS 11A.020

Executive Branch Code of Ethics

When to Abstain from Acting on an Official Decision

In determining whether to abstain from action on an official decision because of a possible conflict of interest, a public servant should consider the following guidelines:

- Whether a substantial threat to his or her independence of judgment has been created by the public servant's personal or private interest;
- The effect of his or her participation on public confidence in the integrity of the executive branch;
- Whether his or her participation is likely to have any significant effect on the disposition of the matter;
- The need for his or her particular contribution, such as special knowledge of the subject matter, to the effective functioning of the executive branch; or
- Whether the official decision will affect the public servant in a manner differently from the public or will affect the public servant as a member of a business, profession, occupation, or group to no greater extent generally than other members of such business, profession, occupation, or group. A public servant may request an advisory opinion from the Executive Branch Ethics Commission in accordance with the Commission's rules of procedure.

Source: KRS 11A.030

Executive Branch Code of Ethics

Prohibited Acts

A public servant is prohibited from the acts as follow:

- A public servant, in order to further his or her own economic interests, or those of any other person, shall not knowingly disclose or use confidential information acquired in the course of his or her official duties.
- A public servant shall not knowingly receive, directly or indirectly, any interest or profit arising from the use or loan of public funds in his or her hands or to be raised through any state agency.
- A public servant shall not act knowingly as representative or agent for the state or any agency in any business or regulatory action with him or herself, or with any business that the public servant or family member has any interest greater than 5 percent.
- A public servant shall not knowingly him or herself or through any business in which he or she owns or controls an interest of more than five percent (5%), or by any other person for the public servant's use or benefit or on the public servant's account, undertake, execute, hold, bid on, negotiate, or enjoy, in whole or in part, any contract, agreement, lease, sale, or purchase made, entered into, awarded, or granted by the agency by which the public servant is employed or which the public servant supervises, subject to the provisions of KRS 45A.340.
- A public servant shall not knowingly accept compensation, other than that provided by law for public servants, for performance of his or her official duties without the prior approval of the Commission.

- A former officer or public servant listed in KRS 11A.010(9)(a) to (g) shall not, within six months of termination of his or her employment, knowingly by himself or through any business in which the public servant owns or controls an interest of at least 5 percent, or by any other person for his use or benefit or on the public servant's account, undertake, execute, hold, bid on, negotiate or enjoy, in whole or in part, any contract, agreement, lease, sale or purchase made, entered into, awarded or granted by the agency by which the public servant was employed. This provision shall not apply to a contract, purchase or good faith negotiation made under KRS 416 relating to eminent domain or to agreements that may directly or indirectly involve public funds disbursed through entitlement programs. This provision shall not apply to purchases from a state agency that are available on the same terms to the general public or made at public auction. This provision shall not apply to former Department of Public Advocacy officers whose continued representation of clients is necessary.
- A present or former officer or public servant listed in KRS 11A.010(9)(a) to (g) shall not, within six months after termination of office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with or is regulated by the state in matters in which the public servant was directly involved during the last 36 months of his or her tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation or profession in which he or she was involved prior to taking office or beginning his or her term of employment, or for which the public servant received, prior to state employment, a professional degree or license, provided that, for 6 months, he or she refrains from working on any matter in which the public servant was directly involved during the last 36 months in state government. This subsection shall not prohibit the ministerial functions, including but not limited to filing tax returns, filing permit or license applications or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

- A former public servant shall not act as a lobbyist or lobbyist's principal in matters in which he or she was directly involved during the last 36 months of his or her tenure for a period of one year after the latter of:
 - (a) The date of leaving office or termination of employment; or
 - (b) The date the term of office expires to which the public servant was elected.
- A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last 36 months of his or her tenure, for a period of one year after the latter of:
 - (a) The date of leaving office or termination of employment; or
 - (b) The date the term of office expires to which the public servant was elected.
- Without the approval of his or her appointing authority, a public servant shall not accept outside employment from any person or business that does business with or is regulated by the state agency for which the public servant works or which he or she supervises, unless the outside employer's relationship with the state agency is limited to the receipt of entitlement funds.
 - (a) The appointing authority shall review administrative regulations established under KRS Chapter 11A when deciding whether to approve outside employment for a public servant.
 - (b) The appointing authority shall not approve outside employment for a public servant if the public servant is involved in decision-making or recommendations concerning the person or business from which the public servant seeks outside employment or compensation.
 - (c) The appointing authority, if applicable, shall file quarterly with the Executive Branch Ethics Commission a list of all employees who have been approved for outside employment along with the name of the outside employer of each.

Source: KRS 11A.040

Executive Branch Code of Ethics

Acceptance of Gifts

As a general rule, gifts should be avoided per the TRS Governance Manual.

The Executive Branch Code of Ethics provides that:

- No public servant, spouse, or dependent child knowingly shall accept any gifts or gratuities, including travel expenses, meals, alcoholic beverages and honoraria, totaling more than \$25 in a calendar year from any person or business that does business with, is regulated by, is seeking grants from, is involved in litigation against or is lobbying or attempting to influence actions of the agency in which the public servant is employed or which he or she supervises, or from any group or association that has as its primary purpose the representation of those persons or businesses. Nothing in this subsection prohibits the commission from authorizing exceptions where such exemption would not create an appearance of impropriety.
- Nothing in KRS 11A shall prohibit or restrict the allocation of or acceptance by a public servant of a ticket for admission to a sporting event if the ticket or admission is paid for by the public servant at face value or is paid for at face value by the individual to whom the ticket is allocated.

*“Gift” is defined, in part, as **“anything of value”**, unless consideration of equal or greater value is received; “gift” does not include gifts from family members, campaign contributions, or door prizes available to the public.” KRS 11A.010(5) **Note: Gift exceptions are still a problem if made on a quid pro quo basis.***

Source: KRS 11A.045

11

Executive Branch Code of Ethics

Statements of Financial Disclosure

Each officer, each public servant listed in KRS 11A.010(9)(a) to (g), and each candidate shall file a statement of financial disclosure with the commission.



Source: KRS 11A.050

TRS Conflict of Interest Statute

No trustee or employee of the board of trustees shall:

1. Have any interest, direct or indirect, in the gain or profits of any investment or transaction made by the board;
2. Directly or indirectly for himself or as an agent for another, use any of the assets of the retirement system in any manner except to make current and necessary payments authorized by the board;
3. Become an endorser, surety, or obligor for moneys loaned to or borrowed from the board;
4. Have a contract or agreement with the retirement system, individually or through a business owned by the trustee or the employee;
5. Use his or her official position with the retirement system to obtain a financial gain or benefit or advantage for himself or herself or a family member;
6. Use confidential information acquired during his or her tenure with the retirement system to further his or her own economic interests or that of another person; or
7. Hold outside employment with, or accept compensation from, any person or business with which he or she has involvement as part of his or her official position with the retirement system. The provisions of this subsection shall not prohibit a trustee from serving as an employee of an agency participating in the Teachers' Retirement System.

Source: KRS 161.460

Policy & Form

BOARD GOVERNANCE MANUAL

APPENDIX 7

CONFLICT OF INTEREST AND CONFIDENTIALITY POLICY

INTRODUCTION

1. Adoption of Conflict of Interest and Confidentiality Policy

Pursuant to the provisions of KRS 161.250, the Board of Trustees (board) of the Teachers' Retirement System of the State of Kentucky (TRS) is vested with the responsibility for the general administration and management of the retirement system. The Board may adopt procedures necessary to conduct the business of the retirement system as needed. The law shall control if any inconsistency exists between the law and this policy.

2. Statement of Conflict of Interest and Confidentiality Policy

TRS recognizes the need to maintain the public's confidence and trust in the integrity of TRS and the Commonwealth of Kentucky. Individuals associated with TRS must not engage in activities that have the potential to become a conflict of interest in their association with TRS. Likewise, individuals associated with TRS must not release information about TRS or any of its members that would breach any duty to protect such information. TRS recognizes the need to establish procedures to prevent such conflicts or breaches.

3. Purpose

The purpose of this Conflict of Interest and Confidentiality Policy is to: establish which individuals are subject to TRS's conflict of interest provisions; establish the specific standards of conduct with regard to conflict of interest; establish standards with regard to the confidentiality of information; and establish procedures for obtaining written conflict of interest statements and confidentiality agreements from certain individuals.

4. Procedures Regarding Conflicts of Interest and Confidentiality

A. Application of Policy

- 1) This policy shall apply to all individuals who have a statutory, contractual or working relationship with TRS.
- 2) Individuals affected by this policy shall include, but are not limited to:
 - a) Employees of TRS;
 - b) The board;
 - c) Independent contractors of TRS;

d) Vendors of TRS;

e) Employees or Officers of the Commonwealth of Kentucky providing legal or expert advice at the request of TRS; and

f) Any person acting in a fiduciary capacity for TRS.

B. Standards of Conduct Regarding Conflicts of Interest

- 1) Individuals have an obligation to diligently identify, disclose, avoid and manage conflicts of interest.
- 2) Potential conflicts of interest exist when an individual or an individual's family may be directly or indirectly financially impacted, whether favorably or detrimentally, by a decision made by TRS in
- 3) Individuals and their family any agency doing business with TRS, without full disclosure of interest in accordance with
- 4) Individuals should not be in member of their family as d
- 5) Individuals should not cond agency in which the individual employment.
- 6) Individuals should not accep discounts, services or other reasonably be inferred that a in the performance of their d
- 7) Individuals must avoid all co that the individual is using b political or private interest.
- 8) Individuals not covered by t must not violate any conflict their duties with TRS. These financial or other transaction standards of the Executive B 11A.

C. Standards of Conduct Regarding

- 1) Individuals associated with TRS may be granted access to confidential information in the course of being a TRS employee, board member or contractor.
- 2) This information may include, but is not limited to, investment trade data; individual member information, including but not limited to, Social Security numbers, names, addresses, phone numbers, birth dates, beneficiaries, health insurance information, member numbers; documents; records; programs; files; scientific or technical information; and other information made available to individuals for purposes of completing their obligations to TRS.
- 3) These individuals have a duty to keep confidential the information to which they are granted access as a result of their association with TRS.
- 4) TRS and these individuals shall also recognize that confidential member information is protected under KRS 161.585.

5. Written Statements of Conflict of Interest and Confidentiality

- A. On an annual basis, the Executive Secretary, Deputy Executive Secretaries, Chief Investment Officer, Director of Investment Strategies, Chief Financial Officer, the members of the board, independent contractors, vendors of TRS and other persons identified in Section 2 (2) shall file a written conflict of interest statement on the form(s) provided by TRS and adopted by the Board of Trustees.
- B. Upon proposal for contract and continuing on an annual basis, any independent contractors and vendors of TRS shall file a written confidentiality agreement on the form provided by TRS and adopted by the Board of Trustees. This form may be amended to conform to specific needs of the individual vendor or contractor as deemed necessary by general counsel or designee.
- C. Other employees of TRS also may be requested to file a written conflict of interest statement as needed or requested by the board.
- D. An individual who abstains from involvement in an official decision because of a personal or private interest must disclose that fact in writing to the executive secretary.

6. Ethics and Confidentiality

Individuals as set forth above shall conform to the Executive Branch Code of Ethics with regard to conflicts of interests as set forth in KRS Chapter 11A and this policy. Individuals as set forth above shall conform to the confidentiality requirements of KRS 161.585.

Adopted March 16, 2009; amended September 19, 2016

**TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY**

**EXTERNAL SERVICE PROVIDER
CONFLICT OF INTEREST STATEMENT**

I, _____, in my role as _____
_____ for the Teachers' Retirement System of the State of Kentucky
(TRS), recognize the need to maintain the public's confidence and trust in the integrity of TRS
and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid and manage conflicts
of interest that may arise through my relationship with TRS.

I will conduct my activities with TRS so that I do not advance or protect my own interests or the
private interests of others with whom I have a relationship, in a way that is detrimental to the
interests of TRS.

In every instance in which I am acting on behalf of TRS, I will conduct my activities in a manner
to best promote the interests of TRS.

I agree not to attempt to influence TRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally
impact my own financial interests or the financial interests of other individuals or organizations
with whom I have a relationship, I will reveal that relationship and abstain from involvement in
the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose
that conflict or potential conflict to my contact person at TRS and seek resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties
with TRS. I will not engage directly or indirectly in any financial or other transaction with a
trustee or employee of TRS that would violate the standards of the Executive Branch Ethics
provisions, as set forth in KRS Chapter 11A.

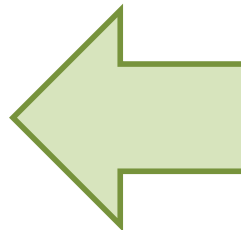
I Agreed this the _____ day of _____, 20__.

Signature

Name

Title

Company



Read, sign & return to TRS

TRS External Service Provider

Conflict of Interest Statement

TRS External Board of Trustees and Employees

Conflict of Interest Statement

Read, sign & return to TRS



TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY

BOARD OF TRUSTEES AND EMPLOYEES CONFLICT OF INTEREST STATEMENT

I, _____, in my role as _____
for the Teachers' Retirement System of the State of Kentucky
(TRS), recognize the need to maintain the public's confidence and trust in the integrity of TRS
and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid and manage conflicts
of interest that may arise through my relationship with TRS.

I will conduct my activities with TRS so that I do not advance or protect my own interests or the
private interests of others with whom I have a relationship, in a way that is detrimental to the
interests of TRS.

In every instance in which I am acting on behalf of TRS, I will conduct my activities in a manner
to best promote the interests of TRS.

I agree not to attempt to influence TRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally
impact my own financial interests or the financial interests of other individuals or organizations
with whom I have a relationship, I will reveal that relationship and abstain from involvement in
the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose
that conflict or potential conflict to the TRS Executive Secretary, or his or her designee, and seek
resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties
with TRS. I will not engage directly or indirectly in any financial or other transaction with a
trustee, employee of TRS or any other person or organization that would violate the standards of
the Executive Branch Ethics provisions, as set forth in KRS Chapter 11A.

Agreed this the _____ day of _____, 20 ____.

Signature

Name

Title

In Summary

The provisions of the Executive Branch Code of Ethics and the TRS Conflict of Interest Statute provide base guidelines for conduct should certain situations arise. As always, it is important to be mindful that TRS needs to avoid not only any actual impropriety, but also even the appearance of impropriety. Just because the Code or Statute may not prohibit a course of conduct does not mean that it should be engaged in.





Teachers' Retirement System
of the State of Kentucky

***Our Members
Come First!***

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502-848-8500

<https://trs.ky.gov>

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Teachers' Retirement System of the State of Kentucky

“Actuarial Standards of Practice”

November 20, 2017
Ed Koebel, EA, FCA, MAAA



Actuarial Standards Board

- Nine members
- Selected by Presidents and Presidents-Elect of the five U.S. based actuarial organizations
- 3-year term, maximum 2 terms (could serve longer if initially appointed to finish someone's incomplete term)
- Composition by specialties

ASB Committees

- Pension
- Health
- Life
- Casualty
- General
- Enterprise Risk Management
- Various subcommittees and task forces

ASB Responsibilities

- Establish and improve standards of actuarial practice
 - Identify what the actuary should consider, document and disclose when performing an actuarial assignment
 - Set standards for appropriate practice for the U.S.
- Not interpretation of ASOPs
- Not Code of Conduct or professionalism
- Not discipline
- Not education

ASOP No. 1

Introduction



- Guidance provided for common terms of construction used in the ASOPs
 - Must – the actuary is unlikely to have any reasonable alternative but to follow the course of action (infrequently used)
 - Should – indicates what is normally the appropriate practice for an actuary to follow when rendering actuarial services
 - Should Consider – suggest potential course of action. If, after consideration, in the actuary's professional judgment action is not appropriate, then it is not required
 - May – the course of action is one that would be considered reasonable and appropriate in many circumstances.

ASOP No. 1

Introduction



➤ Other Guidance

- If the term “actuarially sound” is used, you will need to define it
- Defines other terms used in ASOPs, including deviation, materiality, reasonable, practical/practicable, professional judgment, reliance and significant/significance
- Explains purpose and format of ASOPs and guidance on complying with ASOPs

ASOP No. 41

Actuarial Communications



- Requirements of “Actuarial Communication”
 - Form and Content
 - Clarity
 - Timing of Communication
 - Identification of Responsible Actuary

- An oral communication is an “Actuarial Communication”
 - Not an “Actuarial Document” so not part of an “Actuarial Report”

ASOP No. 41

Actuarial Communications

- When providing an oral communication, consider which Actuarial Report disclosures should be included, for example:
 - Uncertainty/Risk
 - Date of data or other communication
 - Reliance on other sources
 - Impact of subsequent events

- Consider following up with an Actuarial Document
 - Especially if actuary intends for user to rely on results
 - Written follow-up must conform with ASOP 41

ASOP No. 23

Data Quality



- How much data review is enough?
 - Data needs to be appropriate, reasonable and consistent for purposes of assignment
 - Actuary should review data but is not required to audit it
 - Okay if the data has limitations, but should be disclosed

- What to consider if the data has serious flaws?
 - Perhaps data is just too bad to use – can decline assignment or only do part of it
 - Is there sufficient time to collect alternative data?

ASOP No. 23

Data Quality



- Use reasonable adjustments/enhancements?
 - Can use professional judgment to make adjustments to data
 - If adjustments cause results to be uncertain or biased, can still complete assignment but must disclose
 - May compensate for data deficiencies by adjusting results (i.e., widening range)

ASOP No. 27

Economic Assumptions

- Assumptions reviewed this year as part of the regular experience investigation
 - Price inflation
 - Investment return
 - Wage inflation

- “*Selection of Economic Assumptions for Measuring Pension Obligations*” provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans.
 - Reflects actuary’s professional judgment
 - Takes into account historical and current economic data
 - Reflects actuary’s estimate of future experience
 - Has no significant bias

ASOP No. 27 Case Study



➤ Background

- City manager and Investment consultant are close friends
- City manager thinks the actuary is too optimistic
- Investment consultant's bonus based on beating benchmarks

➤ Scenario

- Actuary has to recommend an investment return assumption for the City's Pension Plan for contribution budgeting purposes
- Investment consultant provides capital market expectations to the actuary for 2 time horizons
 - 10 year period (6.0%)
 - 50 year period (8.0%)

ASOP No. 27

Case Study



- How should the actuary use the information the investment consultant provided?
 - Section 3.2 – Identification of Economic Assumptions used in measurement
 - The actuary should consider the following factors when identifying the types of economic assumptions to use for a specific measurement:
 - Purpose of the measurement,
 - Characteristics of the obligation to be measured
 - » Pattern of plan payments over time
 - » Open/Closed Group
 - » Materiality/Volatility

ASOP No. 27

Case Study



- How should the actuary use the information the investment consultant provided?
 - Section 3.5.6 – Views of Experts
 - Economic data and analyses are available from a variety of sources, including representatives of the plan sponsor, investment advisors, economists and other professionals
 - When the actuary is responsible for selecting economic assumptions, the actuary may incorporate the views of experts but the selection or advice should reflect the actuary's professional judgment

ASOP No. 27

Case Study



- Given Section 3.2 of the ASOP and the fact that most of the plan's liabilities are long-term, the actuary thinks the 50-year time horizon is more appropriate
- Also given Section 3.5.6 of the ASOP, in the actuary's professional judgment, the outlook in years 1 through 10 should be considered but the long term outlook is more reliable
- The actuary recommends adoption of 7.5% to the City manager
- Observation: What if the plan was closed to new members?
 - The actuary may put more emphasis on the shorter-term horizon

ASOP No. 35

Demographic Assumptions

- “Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations”
 - Provides guidance to actuaries in selecting demographic assumptions for measuring obligations under defined benefit plans.
 - Types of Demographic Assumptions
 - Retirement
 - Termination of Employment
 - Mortality and Mortality Improvement
 - Disability
 - Election of Optional Forms of Payment
 - Administrative expenses
 - Marriage

ASOP No. 35

Demographic Assumptions

- Consider the Relevant Assumption Universe
 - Experience Studies or Published tables
 - Credible plan experience that has lead to significant gains or losses
 - Studies or reports of the effects of plan design, specific events (e.g. shutdowns), economic conditions
 - Studies or reports of general trends (e.g. mortality improvement)
 - Relevant information from plan sponsor about future expectations

ASOP No. 35

Demographic Assumptions

➤ Disclosures

- Section 3.5.1 – ties retirement to plan design, where specific incentives or disincentives may influence when participants retire
- Section 3.10.2 and 3.10.3 – Materiality and Refined Assumptions
 - May assume 100% of members may respond in a certain way even if you know there may be a very small number who may not
- Section 4.1.1 – 4.1.3 – Communication
 - Actuary should disclose each significant demographic assumption and any changes and whether the assumption represents an estimate of future experience
 - Disclosure may be brief but should be pertinent to the plan's circumstances

ASOP No. 35

Demographic Assumptions

➤ Disclosures

- Section 3.5.1 – ties retirement to plan design, where specific incentives or disincentives may influence when participants retire
- Section 3.10.2 and 3.10.3 – Materiality and Refined Assumptions
 - May assume 100% of members may respond in a certain way even if you know there may be a very small number who may not
- Section 4.1.1 – 4.1.3 – Communication
 - Actuary should disclose each significant demographic assumption and any changes and whether the assumption represents an estimate of future experience
 - Disclosure may be brief but should be pertinent to the plan's circumstances

ASOP No. 44

Asset Valuation Methods

- Measurement of plan's assets and the relationship between assets and its obligations are integral to the valuation process
- Considerations when selecting a method:
 - Purpose and nature
 - Ongoing vs. closed
 - Objectives
 - Desire for stable or predictable costs
 - Desire to achieve a target funding level within a specified time
 - Additional considerations
 - Plan's expected future cash flows and liquidity needs
 - Period of time over which plan assets are expected to be held

ASOP No. 44

Asset Valuation Methods



- Actuarial Value of Assets
 - Asset valuation method is likely to produce actuarial values of assets that are sometimes greater and sometimes less than corresponding market values
 - Actuarial value of assets must fall within a reasonable range of the corresponding market values
 - Any differences between the actuarial value of assets and market value must be recognized within a reasonable period of time
 - The actuarial value of assets should not demonstrate a bias (skewed understatement or overstatement relative to market values) but if it does, the actuary should disclose such bias

ASOP No. 51

Disclosure of Risk



- **Newest ASOP on Assessment and Disclosure of Risk**
 - Effective date for TRS is June 30, 2019
 - Applies to funding valuations, projections and pricing of proposed plan changes
 - Risk – potential of actual future measurements deviating from expected results due to actual experience that differs from the actuarial assumptions.
 - Some analysis is already included in TRS valuation report

ASOP No. 51

Disclosure of Risk



- Identification of Risks to be assessed
 - Investment risk – the potential that investment returns will be different than expected
 - Longevity risk – the potential that mortality or other demographic experience will be different than expected
 - Contribution risk
- Plan maturity measures
 - Ratio of market value of assets to payroll
 - Ratio of cash flow measure to market value of assets
 - Ratio of benefit payments to contributions
 - Ratio of retired liability to total liability

DISCUSSION/QUESTIONS

Aon Hewitt
Retirement and Investment



Investment Best Practices

- Asset Allocation and Portfolio Structure
- Monitoring and Measuring Success



Asset Allocation

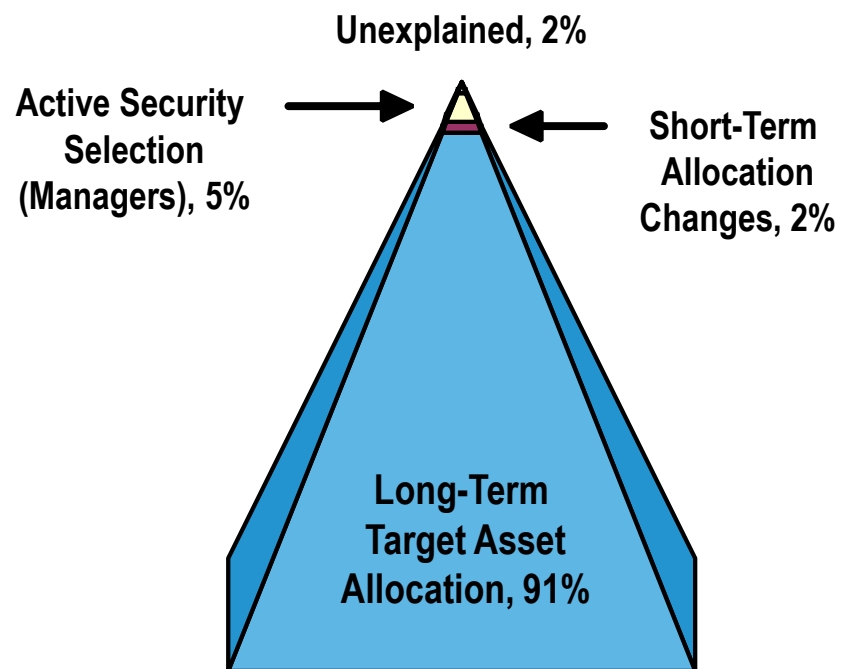
Asset Allocation Best Practices

Best Practice	TRS
Conduct asset liability study every 3-5 years or when circumstances change	✓
Review and establish asset allocation targets and ranges annually	✓
Tweak exposures based on current and near term market opportunities (mid-term views)	✓
Review and model future liquidity needs to determine appropriate amount of illiquid investments	✓
Rebalance the portfolio when ranges are breached and take advantage of short term opportunities	✓
Diversify between and within asset classes, avoid any unwanted style biases	✓

- TRS has a comprehensive and methodical approach to asset allocation

What is Asset Allocation?

- Asset allocation is the mix of investment categories included in a portfolio
- Asset allocation will have the greatest impact on the portfolio's long-term return



Source: Brinson, Singer and Beebower, "Determinants of Portfolio Performance II: An Update" 1991.

Types of Investment Categories

- For asset allocation and asset liability study, we break investments into two general categories:
 - **Safe or Risk Reducing**
 - Provide downside protection
 - Liquid
 - High credit quality
 - Low correlation to risky assets during financial crises
 - May not have a high expected return, but diversification plays an integral role in achieving long-term objectives
 - Likely subject to interim interest rate risk
 - **Return Seeking**
 - Helps plan achieve long-term growth needs
 - May be far more volatile than risk-reducing assets
 - May be far less liquid than risk-reducing assets
 - Provide diversification to other return-seeking assets during normal times

Roles of the Asset Classes

▪ **Public Equity**

- Provide exposure to the incredibly diverse, large, and liquid global stock market
- Provide an important and primary source of growth to the investment program
- Downside is equities are typically very volatile and can have large draw-downs during difficult economic scenarios

▪ **Private Equity**

- Enhance returns
- Gain liquidity premium
- Gain exposure to non-public investments
- Downside is investments are very illiquid, long-term focused, and create additional fees, due diligence and fiduciary challenges

▪ **Real Estate**

- Good diversifier to stocks and bonds
- Real assets can protect against inflation
- Enhance yield relative to bonds and higher risk strategies can provide meaningfully to return

Roles of the Asset Classes (cont'd)

- **High Quality Fixed Income**

- Provide downside protection, liquidity, and a fair return in most market environments
- Can provide cash flow stream similar to liabilities
- Downside is exposure to interest rate risk (some bonds provide floating rates)

- **Additional Categories**

- Used to capture special market opportunities and sub asset classes that can enhance return and/or improve the diversification of the portfolio
 - Below Investment Grade Credit
 - Distressed Credit
 - Opportunistic Credit
 - Direct Lending
- Diverting assets to these categories from fixed income, with interest rates near all-time lows, improves the return profile of the Fund

FY 2018 Target Asset Allocation

	Pension Target	Medical Target
Return Seeking:	83%	90%
U.S. Large Cap Equity	35	58
U.S. Mid Cap Equity	3	
U.S. Small Cap Equity	2	
International Equity	22	
Real Estate	6	5.5
Alternative Investments ¹	7	6.5
Additional Categories ²	8	20
Risk Reducing:	17%	10%
Fixed Income	15	9
Cash	2	1
Total	100%	100%

¹ Alternatives Investments includes private equity, venture capital, timberland, and infrastructure

² Additional Categories includes high yield, bank loans, direct lending, and opportunistic credit

Peer Asset Allocation Comparison

	BNY Mellon Peer Median ¹	TRS Target	TRS Range
U.S. Equity	30.7%	40.0%	34 – 48%
International Equity	19.2	22.0	18 – 25%
U.S. Fixed Income	22.0	15.0	12 – 19%
International Fixed Income	1.3	--	--
Additional Categories ²	--	8.0	5 – 11%
Real Estate	4.9	6.0	4 – 8%
Private Equity	18.5	7.0	4 – 10%
Cash Equivalents	1.7	2.0	1 – 3%
Total Fund	--	100.0%	--

¹ Based on the Total Public Fund >\$1B Universe of 62 public pension funds over \$1 billion compiled by BNY Mellon Performance & Risk Analytics, LLC as of June 30, 2017. Totals will not equal 100.0%. Also, the "Private Equity" category is labeled "Alternative Investments" in BNY Mellon peer universe. Therefore, the allocation may include private equity and hedge fund investments.

² Additional Categories includes high yield, bank loans, direct lending, and opportunistic credit

Factors Impacting Asset Allocation

- Factors impacting the asset allocation decision:
 - Liabilities
 - Risk tolerance
 - Liquidity needs
 - Diversification

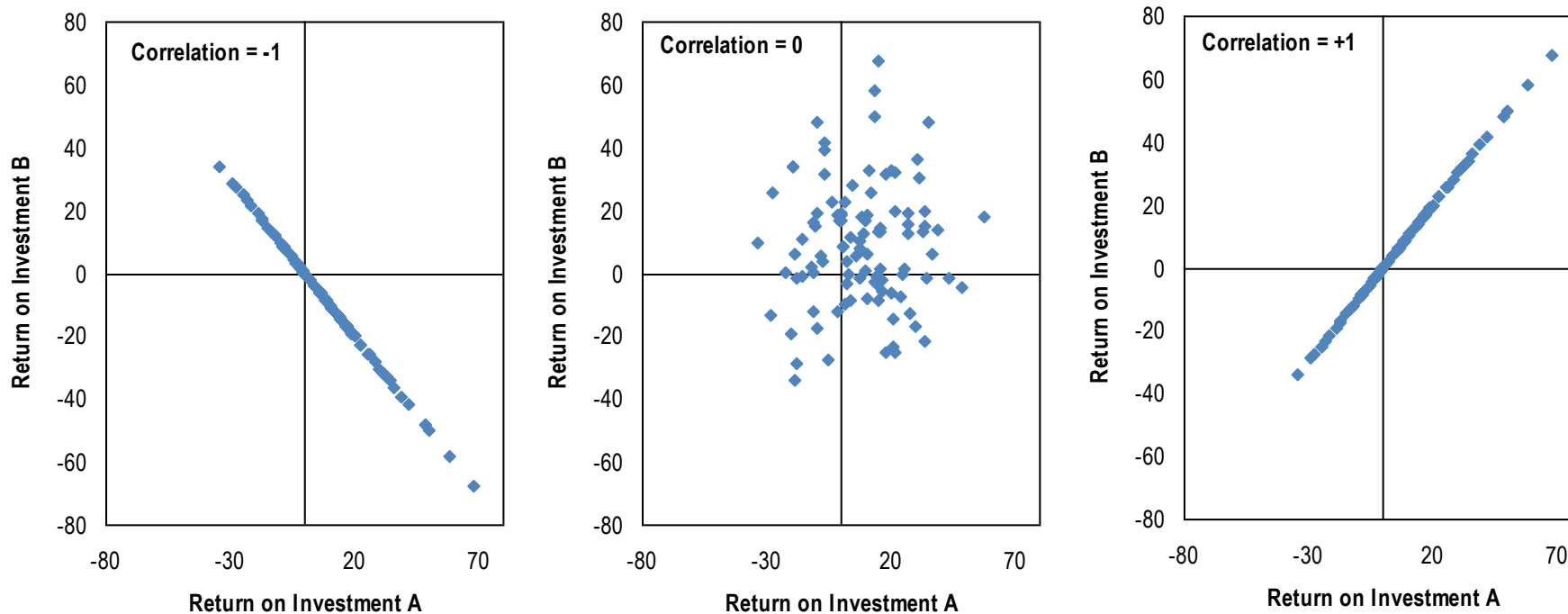
- These factors are considered during the asset allocation setting process
 - Asset liability studies (every 3-5 years or when circumstances change)
 - Asset allocation reviews (annually)

Types of Studies

Metric	Asset Allocation Study/Review	Asset-Liability Study
Frequency	Annual	Tri-Annual
Efficient Frontier	✓	✓
Asset Mix	✓	✓
Broad Asset Classes	✓	✓
Sub-Asset Classes	✓	
Liability-Focus		✓
Cost Projections		✓
Funded Status Projections		✓

Accounting for Diversification

- We measure how closely a pair of investments (here, “A” and “B”) are related by the correlation coefficient, which ranges from -1.0 to +1.0



TRS Risk-Return Expectations (Asset Only)

FY 2018 Asset Allocation Plan (Pension)

		10 Year Assumptions		30 Year Assumptions	
	FY 2018 Allocation	Expected Nominal Return	Expected Risk (Volatility)	Expected Nominal Return	Expected Risk (Volatility)
U.S. Large Cap Equity	37.4%	6.5%	17.0%	6.5%	17.0%
U.S. Small Cap Equity	2.6	6.7	23.0	7.0	23.5
Developed Int'l Equity	16.5	7.1	20.0	7.1	20.5
Emerging Markets Equity	5.5	7.5	30.0	7.5	30.5
Real Estate	6.0	5.5	12.5	5.5	12.5
Private Equity	7.0	8.6	24.0	8.6	24.5
High Yield	2.0	3.9	12.0	5.4	12.0
Other Additional Categories ¹	6.0	4.4	8.9	5.3	9.2
Fixed Income – Inv. Grade	15.0	2.9	4.0	3.7	5.0
Cash (LIBOR)	2.0	2.5	1.0	3.3	2.0
Total²	100.0%	6.5%	13.1%	6.7%	13.3%

- Return assumption is 7.5%

¹ Other Additional Categories is modeled as 50% high yield and 50% bank loans

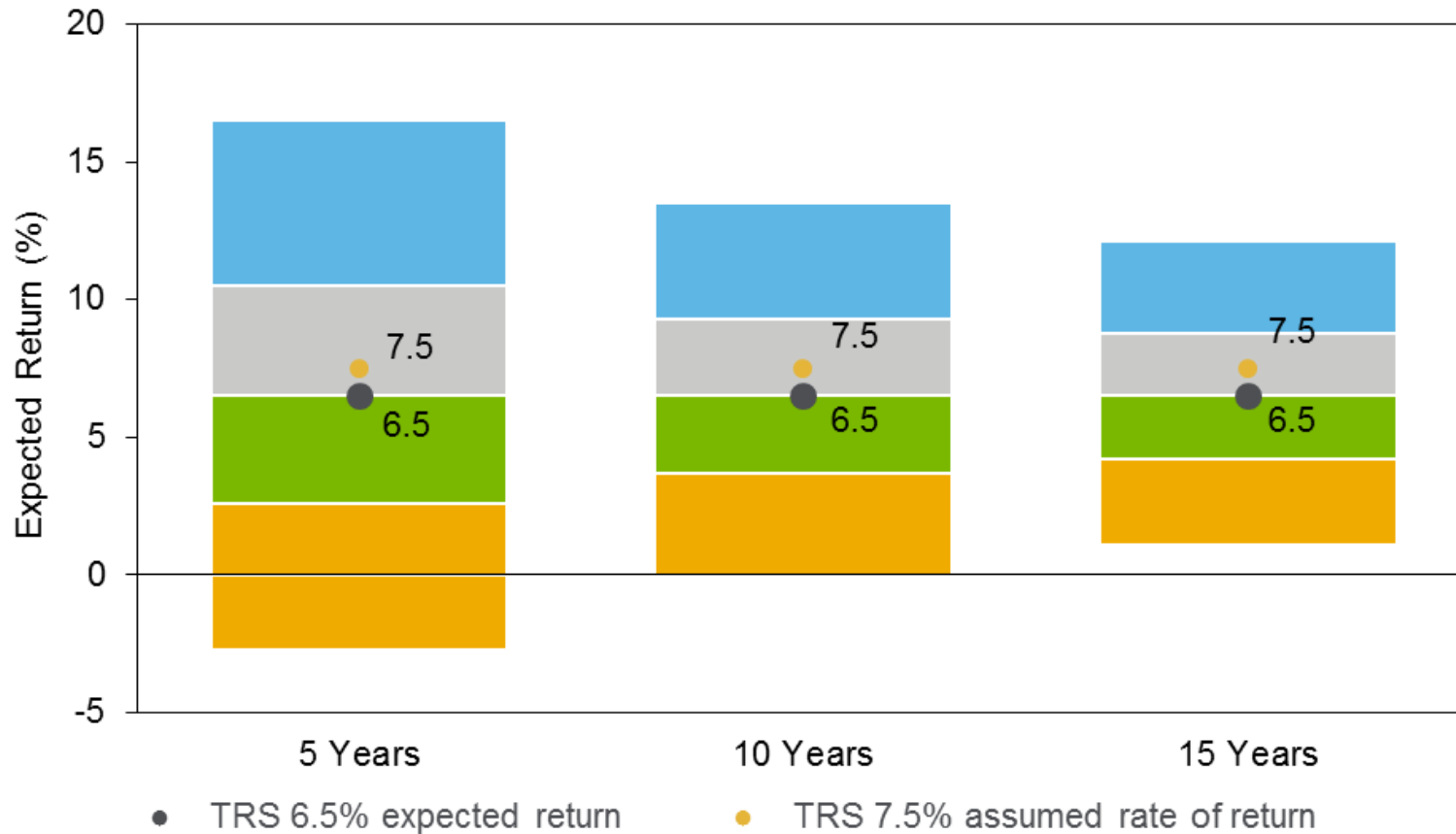
² Inflation rate assumption = 2.2%

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TRS Expectations Over Time (10 Years)

Expected Returns Percentiles (10 Year Assumptions)
5th, 25th, 50th, 75th, 95th



- The expectations are volatile even over longer-periods

Correlation of TRS Asset Classes

- Fixed Income, Real Estate and Private Equity exhibit low-to-negative correlations to the other asset classes, creating value from diversification.

5 Year Correlation Ending June 30, 2017						
	U.S. Equity	International Equity	Fixed Income	Additional Categories ¹	Real Estate	Private Equity
U.S. Equity	1.00					
International Equity	0.80	1.00				
Fixed Income	-0.10	0.10	1.00			
Additional Categories ¹	0.47	0.55	0.25	1.00		
Real Estate	-0.07	0.07	0.33	-0.05	1.00	
Private Equity	0.01	0.06	0.01	0.03	0.21	1.00

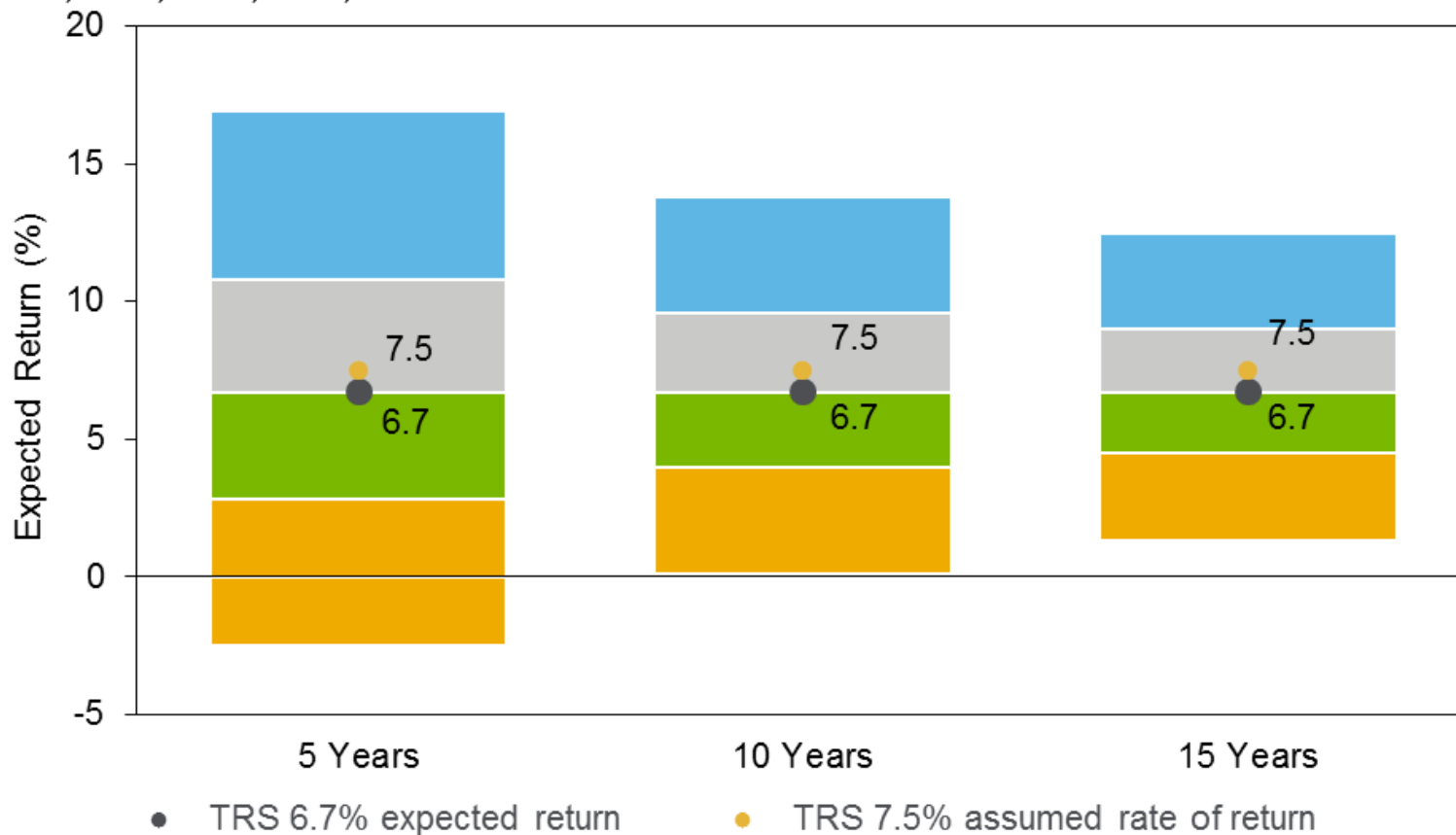
¹ Additional Categories includes high yield, bank loans, direct lending, and opportunistic credit

* Asset class returns are gross of fees

TRS Expectations Over Time (30 Years)

Expected Returns Percentiles (30 Year Assumptions)

5th, 25th, 50th, 75th, 95th



- The expectations are volatile even over longer-periods

Liabilities

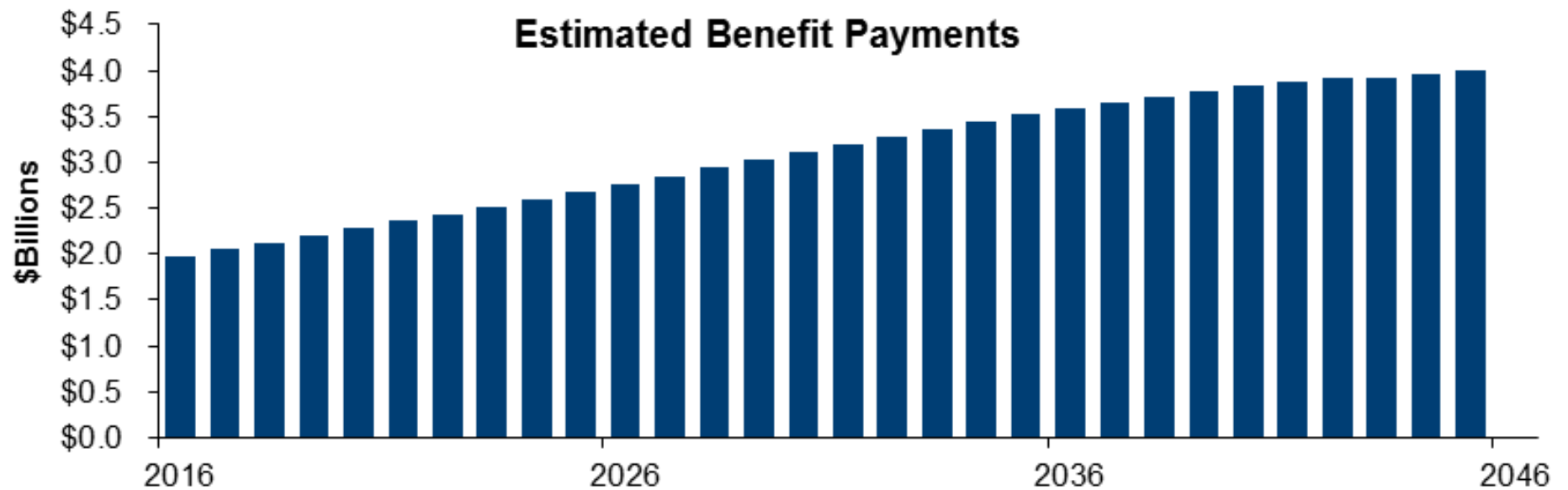
- Ultimate goal is to have sufficient assets to pay the accrued (promised) benefits of the plan
 - Benefit liabilities should drive prudent investment decisions
 - Assuming too much or too little investment risk can jeopardize attaining this goal
- Achieving or exceeding assumed rate of return must be balanced with protecting the accumulated assets
- The focus should be specific to the circumstances of the Fund

What is an Asset Liability Study?

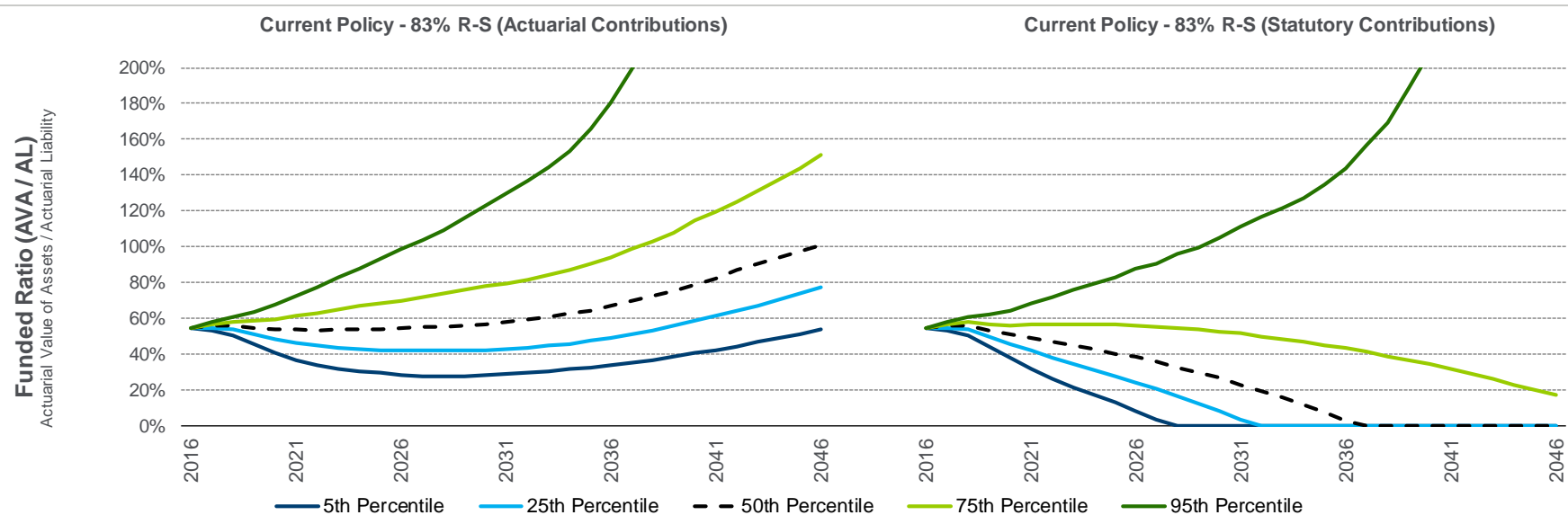
An Asset Liability Study:

- **Provides** fiduciaries with an understanding of the dynamic relationship between plan assets and liabilities over time.
- **Allows** for the exploration of the impact that funding strategies, benefit design changes, and, importantly, investment policy decisions have on critical financial measures of the plan's financial health (e.g., required contributions, funded status, expenses in the near and/or long run)
- **Identifies** future trends in the financial health of the plan based on economic uncertainties that may not be evident from an actuarial valuation, which provides only a snapshot at a point in time.
- **Illustrates** the impact of various asset allocation targets on the plan's cost under normal and unfavorable economic conditions. Thus, it provides guidance in the fiduciaries' decision-making process to formulate an asset allocation target for the pension plan.

TRS Pension Liability Profile



2017 Asset Liability Study Example Exhibit



Strategy	Current Policy - 83% R-S (Actuarial Contributions)			Current Policy - 83% R-S (Statutory Contributions)		
Year	2026	2036	2046	2026	2036	2046
5th Percentile	28%	34%	54%	9%	0%	0%
25th Percentile	42%	49%	77%	24%	0%	0%
50th Percentile	55%	67%	101%	38%	3%	0%
75th Percentile	70%	94%	151%	56%	44%	17%
95th Percentile	99%	181%	483%	88%	144%	321%
Probability > 100%	<5%	24%	51%	<5%	14%	20%

- Comparing contribution policies in an asset liability modeling context highlights the needs for appropriate funding

Liquidity Needs

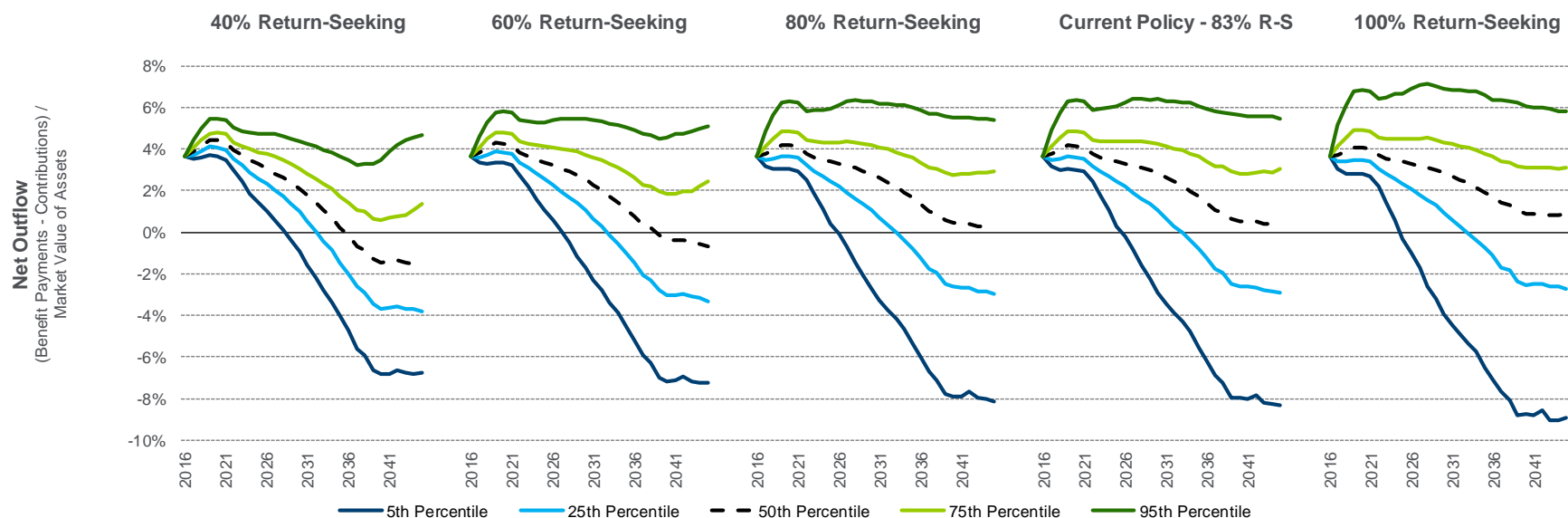
- A Fund's ability to invest in illiquid asset classes is inhibited when:
 - Withdrawals are unexpected
 - Withdrawals require a high or increasing percentage of the Fund's assets
- In mature pension plans, the percentage of plan assets that is needed to meet benefit payment typically increases
- Boards of mature plans are challenged to set an investment policy that balances a fund's conflicting objectives – investments that provide safety and liquidity versus investments that can potentially grow assets materially

TRS Pension Liquidity Profile

Asset Class	Total Plan	Liquid	Quasi-Liquid	Illiquid: 5-10 Years	Illiquid: 10+ Years
Public Equity	62%	62%			
High Quality Fixed Income	15%	15%			
Cash	2%	2%			
Additional Category: High Yield	2%	2%			
Other Additional Categories ¹	6%		6%		
Real Estate	6%			6%	
Private Equity	7%				7%
Total	100%	81%	6%	6%	7%

¹ Other Additional Categories includes bank loans, direct lending, and opportunistic credit

Liquidity Modeling – 2017 Asset Liability Study



Strategy	40% Return-Seeking			60% Return-Seeking			80% Return-Seeking			Current Policy - 83% R-S			100% Return-Seeking		
Year	2025	2035	2045	2025	2035	2045	2025	2035	2045	2025	2035	2045	2025	2035	2045
5th Percentile	1%	-4%	-7%	1%	-5%	-7%	0%	-5%	-8%	0%	-6%	-8%	0%	-7%	-9%
25th Percentile	3%	-1%	-4%	3%	-1%	-3%	2%	-1%	-3%	2%	-1%	-3%	2%	-1%	-3%
50th Percentile	3%	0%	-2%	3%	1%	-1%	3%	2%	0%	3%	2%	0%	3%	2%	1%
75th Percentile	4%	2%	1%	4%	3%	2%	4%	4%	3%	4%	4%	3%	4%	4%	3%
95th Percentile	5%	4%	5%	5%	5%	5%	6%	6%	5%	6%	6%	5%	7%	7%	6%
Probability > 2%	85%	22%	21%	82%	37%	29%	79%	46%	34%	79%	46%	35%	77%	49%	37%

Diversification

- Diversification is required under the Prudent Investor Rule
- Diversification by asset class serves to:
 - Reduce the risk of loss in a single investment
 - Reduce the volatility of returns
 - Diminish the impact of poor performance of a single asset class on the total fund
- Diversification creates a more efficient portfolio as the different asset classes are not perfectly correlated with each other
 - The most recent financial crisis saw increased correlations, however
- Each asset class has:
 - An expected risk/return profile
 - A role in the portfolio

Asset Classes – Theoretical Risk/Return Trade-offs



Periodic Table of Performance

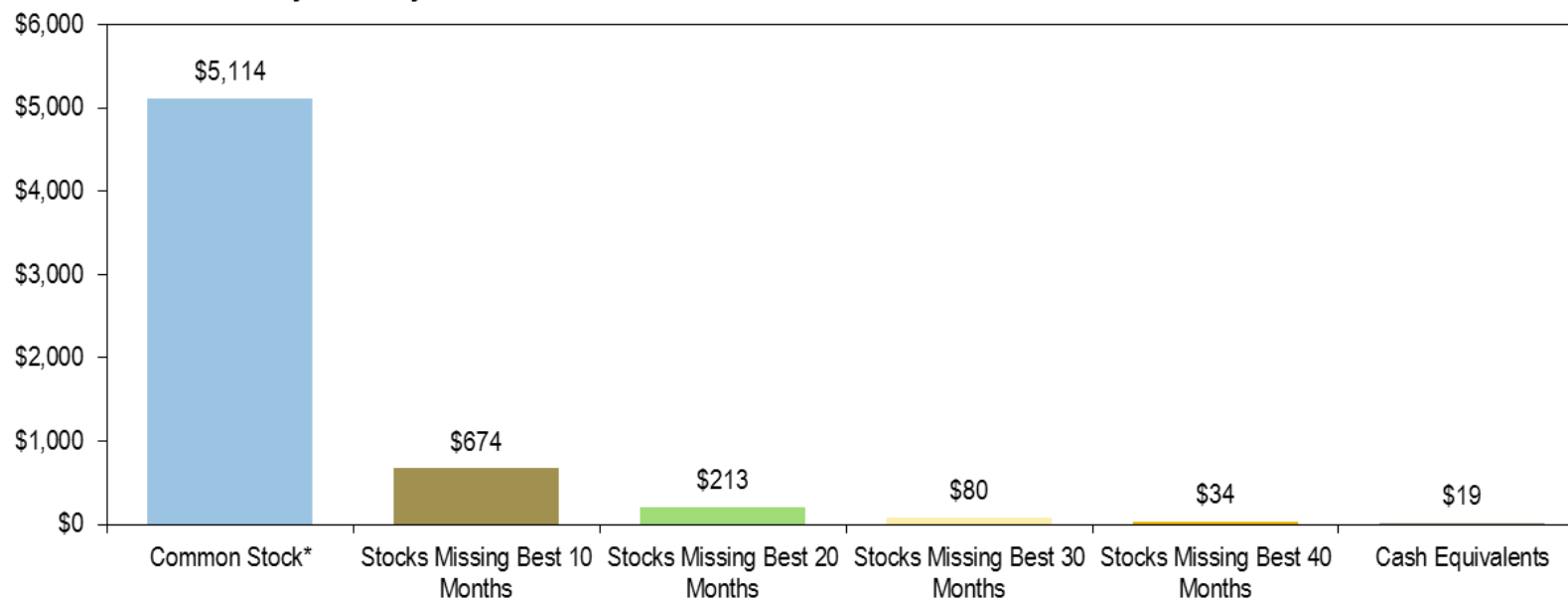
1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
		REITs 35.3							EM 55.8	REITs 31.6	EM 34.0				EM 78.5	Sm Growth 28.0		REITs 19.7				Sm Value 31.7
	Lg Value 38.4	Cmnty 33.9							Sm Growth 48.5	EM 25.6	Cmnty 25.6	REITs 35.1			High Yield 58.2	REITs 27.9		EM 18.2				Lg Value 17.3
	Lg Growth 37.2	Lg Growth 23.1	Lg Value 35.2						Sm Value 46.0	Sm Value 22.3	EAFE 13.5	EM 32.2			Lg Growth 37.2	Sm Value 24.7		Sm Value 18.0				High Yield 17.1
	Sm Growth 31.0	Lg Value 21.6	Sm Value 31.8		EM 66.0				EAFE 38.6	EAFE 20.2	REITs 12.2	EAFE 26.3	EM 39.4		Sm Growth 34.5	EM 18.9		Lg Value 17.5	Sm Growth 43.3	REITs 28.0		Cmnty 11.4
	Sm Value 25.8	Sm Value 21.4	Lg Growth 30.5		Sm Growth 43.1				REITs 37.1	Cmnty 17.3	HFOF 7.5	Sm Value 23.5	Cmnty 32.7		EAFE 31.8	High Yield 15.1		EAFE 17.3	Sm Value 34.5	Lg Value 13.5		Sm Growth 11.3
	Cmnty 20.3	HFOF 14.4	REITs 20.3	Lg Growth 38.7	Cmnty 40.9	Cmnty 49.7			Lg Value 30.0	Lg Value 16.5	Lg Value 7.1	Lg Value 22.2	Lg Growth 11.8		REITs 28.0	Lg Value 15.1		High Yield 15.8	Lg Growth 33.5	Lg Growth 13.1		EM 11.2
	High Yield 19.2	High Yield 11.4	HFOF 16.2	EAFE 20.0	Lg Growth 33.1	REITs 26.4	Sm Value 14.0		Lg Growth 29.8	Sm Growth 14.3	Lg Growth 5.3	Sm Growth 13.4	EAFE 11.2		Sm Value 20.6	Lg Growth 15.1	REITs 8.3	Lg Growth 15.3	Lg Value 32.5	Bonds 6.0		REITs 8.6
EAFE 7.8	Bonds 18.5	Sm Growth 11.3	Sm Growth 12.9	Lg Value 15.6	EAFE 27.0	Sm Value 22.8	REITs 13.9	Cmnty 32.1	High Yield 29.0	High Yield 11.1	Sm Value 4.7	High Yield 11.8	HFOF 10.3		Lg Value 19.7	Cmnty 9.0	Bonds 7.8	Sm Growth 14.6	EAFE 22.8	Sm Growth 5.6		Lg Growth 7.1
Cmnty 5.3	REITs 15.3	EAFE 6.0	High Yield 12.8	Bonds 8.7	HFOF 26.5	Bonds 11.6	Bonds 8.4	Bonds 10.3	Cmnty 20.7	HFOF 6.9	Sm Growth 4.1	HFOF 10.4	Sm Growth 7.0		Cmnty 13.5	EAFE 7.8	High Yield 5.0	HFOF 4.8	HFOF 9.0	Sm Value 4.2	Lg Growth 5.7	Bonds 2.6
REITs 3.2	EAFE 11.2	EM 5.7	Bonds 9.7	High Yield 1.9	Lg Value 7.3	Lg Value 7.0	High Yield 5.3	REITs 3.8	HFOF 11.6	Lg Growth 6.3	High Yield 2.7	Lg Growth 9.1	Bonds 7.0		HFOF 11.5	Bonds 6.5	Lg Growth 2.6	Bonds 4.2	High Yield 7.4	HFOF 3.4	REITs 2.8	EAFE 1.0
Lg Growth 2.7	HFOF 11.1	Bonds 3.6	EAFE 1.8	Sm Growth 1.2	High Yield 2.4	HFOF 4.1	HFOF 2.8	HFOF 1.0	Bonds 4.1	Bonds 4.3	Bonds 2.4	Bonds 4.3	High Yield 1.9	Bonds 5.2	Bonds 5.9	HFOF 5.7	Lg Value 0.4	Cmnty 0.1	REITs 2.9	High Yield 2.5	Bonds 0.5	HFOF 0.7
High Yield -1.0	EM -5.5		EM -11.8	HFOF -5.1	Bonds -0.8	High Yield -5.9	EM -2.6	High Yield -1.4				Cmnty -15.1	Lg Value -0.2	HFOF -21.4			Cmnty -1.2		Cmnty -12	EM -2.2	HFOF -0.2	
Sm Value -1.6			Cmnty -14.1	Sm Value -6.5	Sm Value -1.5	EAFE -14.2	Lg Value -5.6	EM -6.2					Sm Value -9.8	High Yield -26.2			Sm Growth -2.9		Bonds -2.0	EAFE -4.9	EAFE -0.8	
Lg Value -2.0				REITs -17.5	REITs -4.6	Lg Growth -22.4	Sm Growth -9.2	Sm Value -11.4					REITs -15.7	Sm Value -28.9			Sm Value -5.5		EM -2.6	Cmnty -33.1	Sm Growth -1.4	
Sm Growth -2.4				EM -25.6		Sm Growth -22.4	Lg Growth -20.4	Lg Value -15.5						Lg Value -36.8				HFOF -5.7			Lg Value -3.8	
Bonds -2.9				Cmnty -35.7		EM -30.8	EAFE -21.4	EAFE -15.9						REITs -37.7				EAFE -12.1			High Yield -4.4	
HFOF -3.5							Cmnty -31.9	Lg Growth -27.9						Lg Growth -38.4				EM -18.4			Sm Value -7.5	
EM -7.6								Sm Growth -30.3						Sm Growth -38.5							EM -14.9	</

*Large Growth – Russell 1000 Growth; Large Value – Russell 1000 Value; Small Growth – Russell 2000 Growth; Small Value – Russell 2000 Value; EAFE – MSCI EAFE; EM – MSCI EM; REITs – NAREIT; Bonds – Barclays Aggregate; High Yield – Barclays High Yield; Cmtv – GSCI; HFOF – HFR FOF

- Asset class returns can be sporadic over time, and the best performing asset classes often become the worst

Why Not Time the Market?

Value of \$1 Invested from January 1926 - July 2017



* Represented by Ibbotson/DJ Total U.S. Stock Market Index

- Timing the capital markets has proven to be very difficult over time, and missing out on a market rally can have meaningful impacts
- Moving between asset classes or asset class segments can produce a return shortfall that is difficult to recoup

Diversification Example

Diversification usually reduces volatility and, under certain conditions, can help increase returns.

The below example arbitrarily assumes a specific pattern of returns from two investments to illustrate the value added by diversification. It shows that a diversified portfolio earns a return of 10.25%; whereas, exclusive investment in either investment produces a return of only 8%. In addition, the diversified portfolio incurs a lower level of risk (volatility).

Example

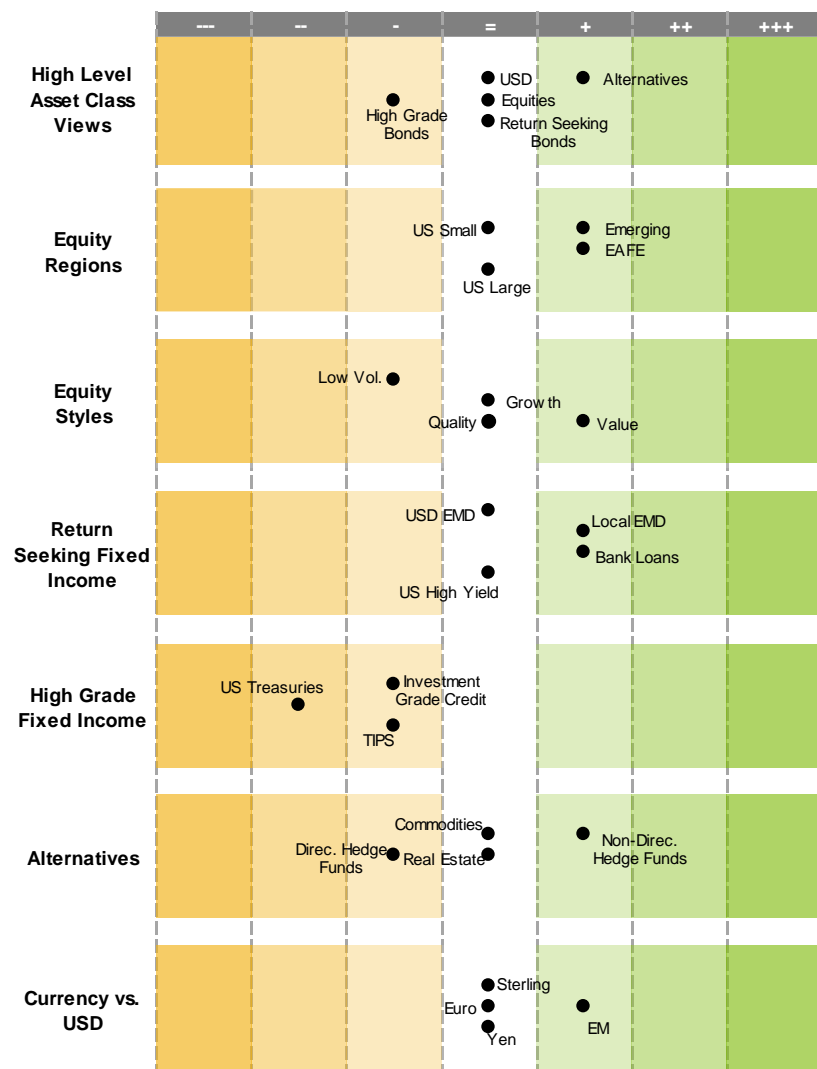
	Year 1	Year 2	Cumulative
Investment "A"	20.00%	-10.00%	8.00%
Investment "B"	<u>-10.00%</u>	<u>20.00%</u>	<u>8.00%</u>
50/50 Portfolio	5.00%	5.00%	10.25%

- This example makes some major assumptions to reach its conclusions. The assumptions are noted below:
 - Perfect negative correlation between stocks and bonds
 - Rebalancing at the end of year 1
 - Mean reversion
 - Same cumulative returns from stocks and bonds

Medium-Term Views

Medium-term views express our desired over/under weights relative to a diversified long-term strategic benchmark.

October 2017 Medium Term Views



Changes and Actions

Overweight alternatives, particularly non-directional strategies. High grade bonds should be the funding asset of choice. Constrain equity beta close to benchmark.

Favor non-US equities vs. US equities.

Favor value-oriented factors.

Maintain preferences for emerging market debt and loans over high yield.

Favor credit over treasuries, but do not expect great things from either. TIPS are offer some attractions for inflation hedgers, but are not as attractive as they once were.

Non-directional low correlation strategies, for example global macro and some CTA strategies, should be preferred for risk mitigation.

We expect some dollar strength against the major developed currencies from here but over a 1 to 3 year horizon, we expect more range bound performance. EM currencies are expected to appreciate.

Rebalancing

Rebalancing is key to maximizing the value added from diversification.

Example – Rebalancing

	Year 1	Year 2	Cumulative
Investment “A”	20.00%	-10.00%	8.00%
Investment “B”	<u>-10.00%</u>	<u>20.00%</u>	<u>8.00%</u>
50/50 Portfolio	5.00%	5.00%	10.25%

Example – No Rebalancing

	Year 1	Year 2	Cumulative
Investment “A”	20.00%	-10.00%	8.00%
Investment “B”	<u>-10.00%</u>	<u>20.00%</u>	<u>8.00%</u>
50/50 Portfolio	5.00%	2.86%	8.00%

- If the portfolio is not rebalanced at the end of the first year, its composition for the second year is:
 - 57.1% Investment “A”
 - 42.9% Investment “B”
- No rebalancing, in this case, implies no value added though the correlation is perfectly negative. The diversified portfolio does, however, have lower volatility than the undiversified portfolios.

Pension Plan Rebalancing Ranges

Asset Class	Pension Plan		Medical Plan	
	Target	Range	Target	Range
U.S. Large Cap Equity	35%	32 – 40%	58%	51 – 64%
U.S. Mid Cap Equity	3	1 – 5%		
U.S. Small Cap Equity	2	1 – 3%		
International Equity	22	18 – 25%		
Real Estate	6	4 – 8%	5.5	3 – 10%
Alternative Investments ¹	7	4 – 10%	6.5	3 – 11%
Additional Categories ²	8	5 – 11%	20	16 – 25%
Fixed Income	15	12 – 19%	9	6 – 12%
Cash	2	1 – 3%	1	0 – 4%
Total	100%		100%	

¹ Alternatives Investments includes private equity, venture capital, timberland, and infrastructure

² Additional Categories includes high yield, bank loans, direct lending, and opportunistic credit

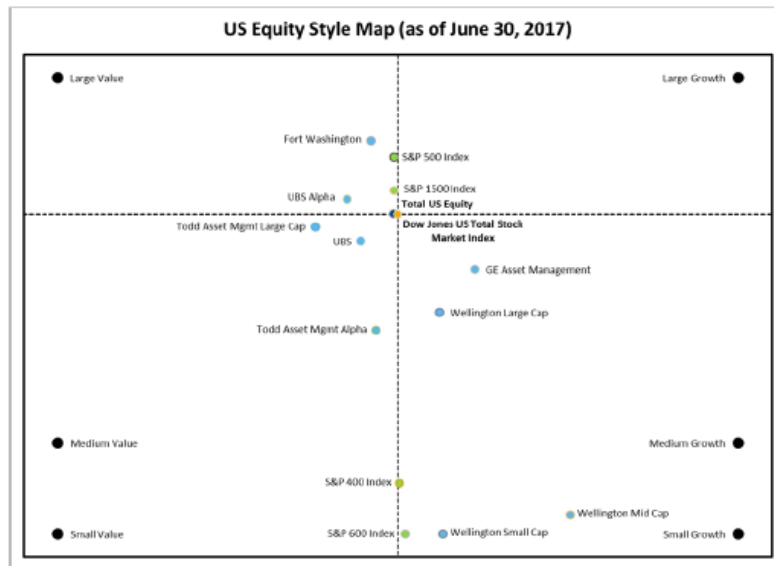
Asset Class Structure Example – Equities

- Considerations in equity structure
 - Active vs. passive
 - Growth and value styles
 - Market capitalization (size of companies)
 - U.S. and non-U.S. (developed and emerging)
- Diversification is also important within asset classes to get the full benefit of the Total Fund asset allocation
- Unintended biases in the portfolio versus the benchmark or market portfolio can lead to undesired outcomes
- Diversified portfolios tend to exhibit less volatility over time

TRS Pension U.S. Equity Style Analysis

Style Analysis

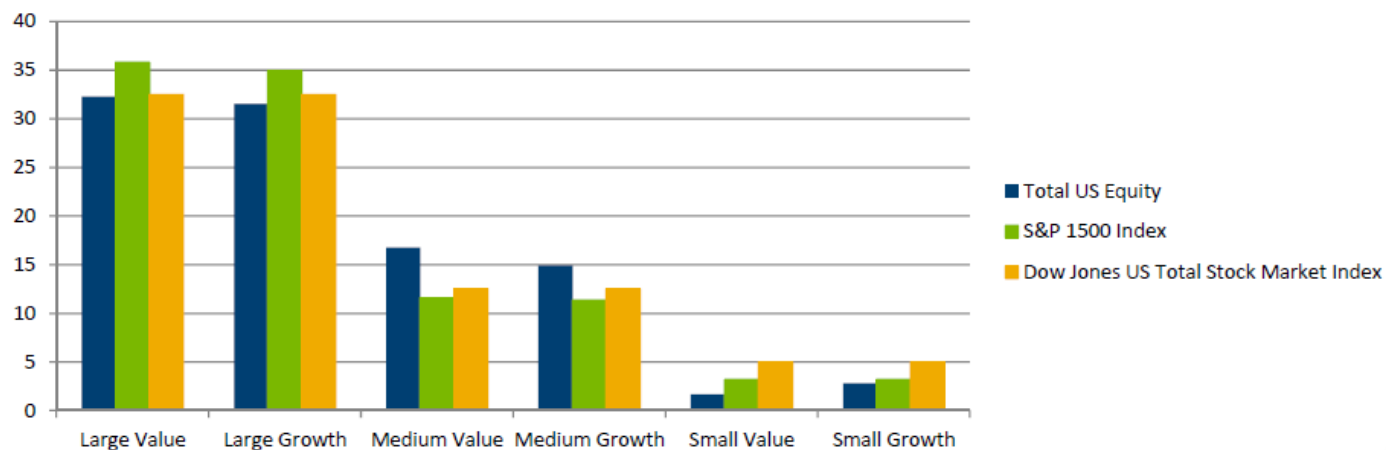
U.S. Equity Style Analysis



The top graph illustrates style analysis for the U.S. Equity component. The vertical axis indicates capitalization characteristics (large or small company bias), while the horizontal axis indicates valuation characteristics (value and growth orientation). The intersection between the two axes represents a neutral capitalization and valuation style that is represented by the broad market index. Any manager falling above the axis is referred to as large cap and any manager falling below the axis is considered to be medium to small cap. Managers to the left of axis have a value bias while managers to the right of the axis have a growth bias.

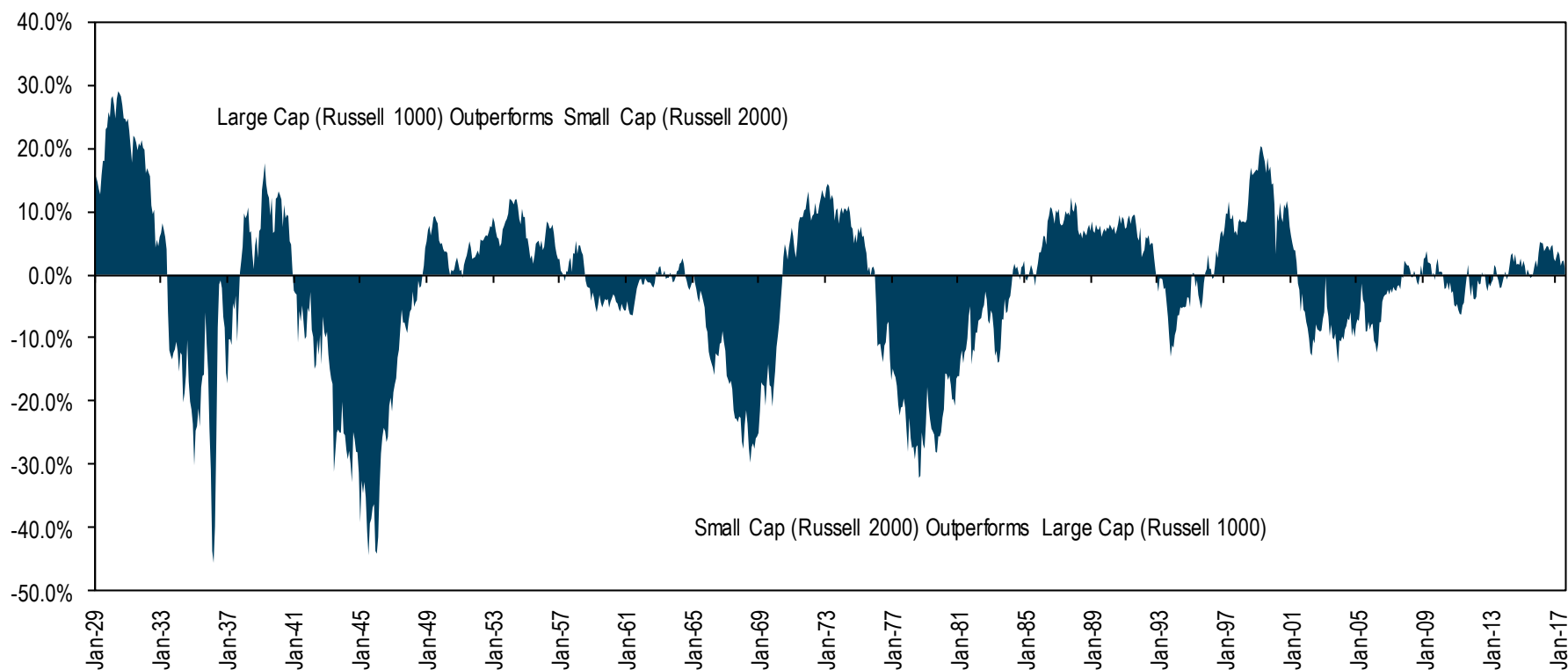
The bottom chart compares the allocation of Total U.S. Equity and its benchmarks among the different styles.

The 5 year tracking error for the U.S. Equity portfolio vs. the Dow Jones U.S. Total Stock Market Index was 1.21%.



Style Rotation - Large Cap vs Small Cap

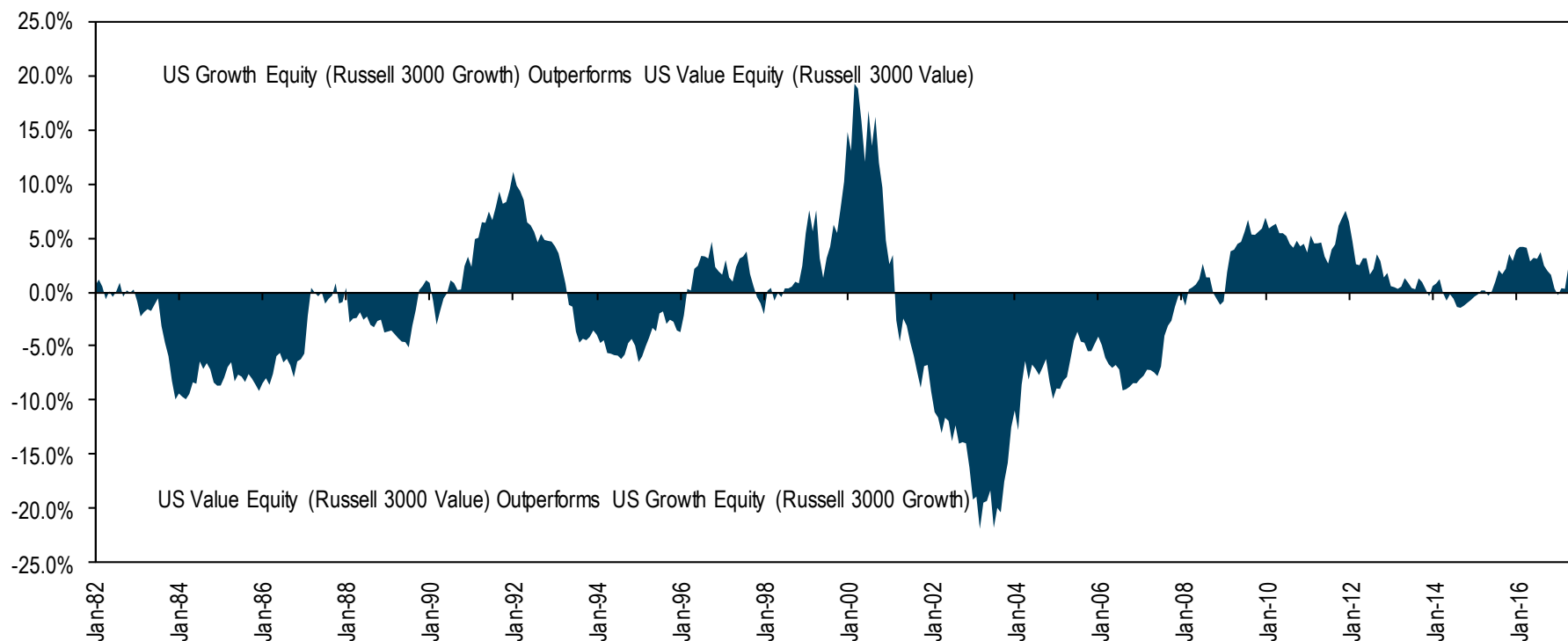
Large Cap Outperforms Small Cap - Rolling 3-Year Difference in Returns ending 07/31/2017



- Style biases can persist for extended periods of time and reverse quickly
- Predicting whether large cap or small cap will outperform in any given year is a challenging exercise
- Research has shown that making these types of style bets has proven difficult for investors

Style Rotation – Growth vs Value

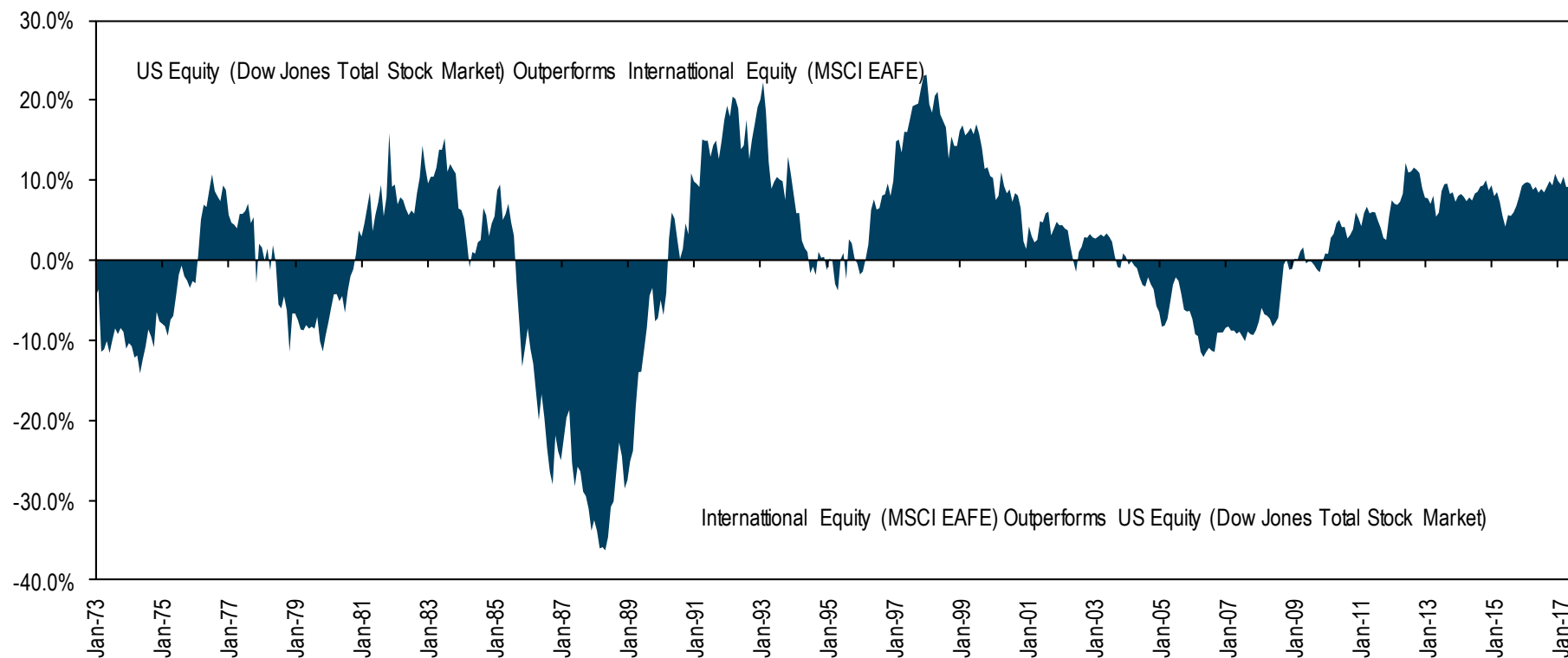
US Growth Equity Outperforms US Value Equity - Rolling 3-Year Difference in Returns ending 07/31/2017



– Growth vs Value has also seen volatile trends over time

Style Rotation – U.S. vs Non-U.S. Equity

US Equity Outperforms International Equity - Rolling 3-Year Difference in Returns ending 07/31/2017



- U.S. markets have outperformed over recent periods, but there have also been prolonged periods of U.S. equity underperformance

Asset Allocation Best Practices - Summary

Best Practice	TRS
Conduct asset liability study every 3-5 years or when circumstances change	✓
Review and asset allocation targets and ranges annually	✓
Tweak exposures based on current and near term market opportunities (mid-term views)	✓
Review and model future liquidity needs to determine appropriate amount of illiquid investments	✓
Rebalance the portfolio when ranges are breached and advantage of short term opportunities	✓
Diversify between and within asset classes, avoid any unintended or unwanted style biases	✓

- TRS has a comprehensive and methodical approach to asset allocation



Monitoring and Measuring Success

Best Practices in Performance Measurement

Best Practice	TRS
Measure performance relative to a policy benchmark (weighted average of policy targets and asset class benchmarks)	✓
Peer comparisons – absolute and risk adjusted	✓
Relative to long-term return assumptions	✓
Attribution analysis – total fund and asset classes	✓

- TRS has a comprehensive and methodical approach to performance measurement

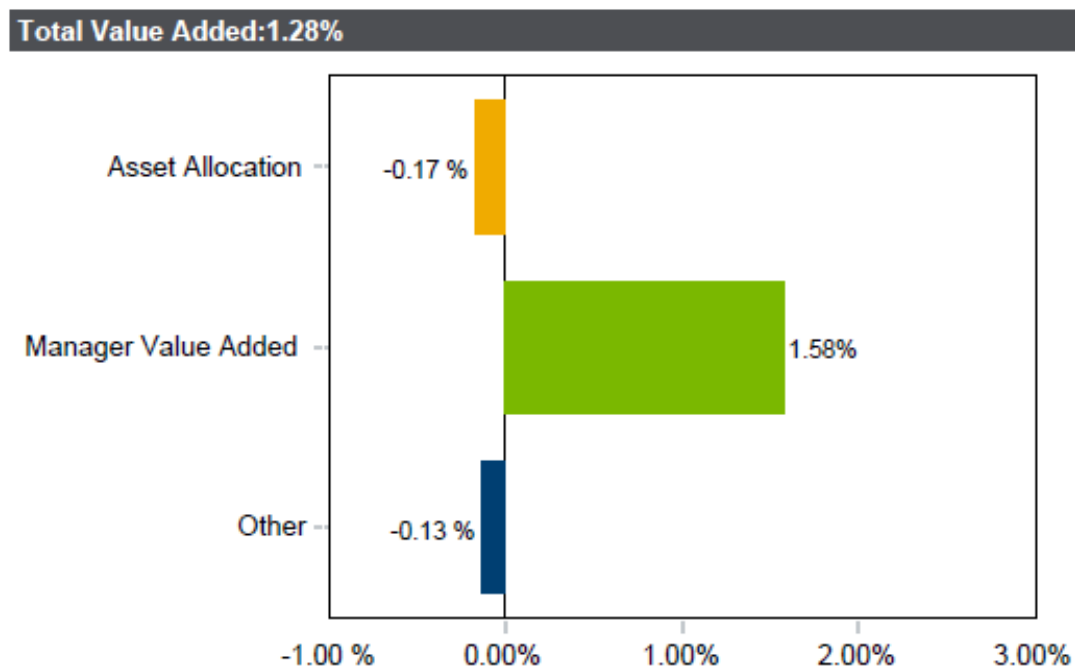
Performance Evaluation – June 30, 2017

	Allocation %	Trailing 1 Year	Trailing 3 Years	Trailing 5 Years	Trailing 10 Years
Total Fund	100.0	15.3	6.3	10.1	6.3
<i>Policy Benchmark</i>		14.1	6.2	9.7	--
<i>Public Fund Index</i>		12.9	5.3	8.9	5.4
Total Equity	62.9	21.9	7.1	13.2	6.2
<i>MSCI AC World Index</i>		19.4	5.4	11.1	4.3
<i>MSCI AC World IMI</i>		19.6	5.4	11.3	4.5
Total U.S. Equity	41.3	21.1	9.0	15.0	7.5
<i>S&P Spliced Index</i>		18.1	9.5	14.7	7.3
<i>S&P Composite 1500</i>		18.1	9.5	14.7	7.3
<i>S&P 500 Index</i>		17.9	9.6	14.6	7.2
Total International Equity	21.6	23.4	2.6	8.8	2.4
<i>MSCI AC World ex USA Index</i>		21.0	1.3	7.7	1.6
<i>MSCI Spliced Index</i>		21.0	1.3	7.7	1.1
<i>MSCI EAFE Index</i>		20.8	1.6	9.2	1.5

Performance Evaluation – June 30, 2017 (cont'd)

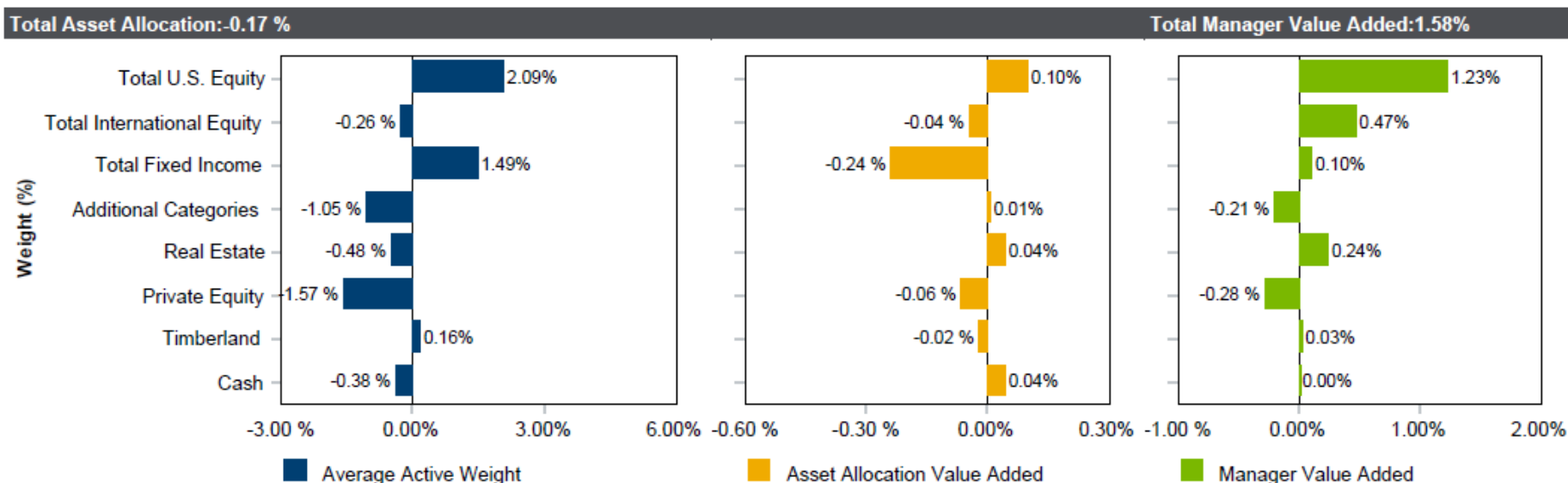
	Allocation %	Trailing 1 Year	Trailing 3 Years	Trailing 5 Years	Trailing 10 Years
Total Fixed Income	16.4	0.1	3.0	2.9	5.4
<i>Bloomberg Barclays U.S. Gov't/Credit</i>		-0.4	2.6	2.3	4.6
Additional Categories	7.7	10.2	3.1	6.7	--
<i>Additional Categories Performance Benchmark</i>		12.8	4.5	6.9	--
Real Estate	5.4	9.3	11.7	11.1	--
<i>Real Estate Performance Benchmark</i>		5.2	6.0	6.1	--
Private Equity	4.6	--	--	--	--
Timberland	1.1	--	--	--	--
Cash	2.0	0.5	0.3	0.2	0.6
<i>Citigroup 3 Month T-Bill</i>		0.5	0.2	0.1	0.5

Total Fund Attribution – 1-Year Ended 6/30/2017



- The Total TRS Pension outperformed the Policy Benchmark by 1.2% in FY 2017
- Asset allocation effect measures the impact of actual allocations differing from the Total Fund policy targets
- Manager value added is derived from the asset classes outperforming the respective asset class benchmarks
- Other is mostly from cash movements between asset classes and in and out of the Fund

Total Fund Attribution – 1-Year Ended 6/30/2017



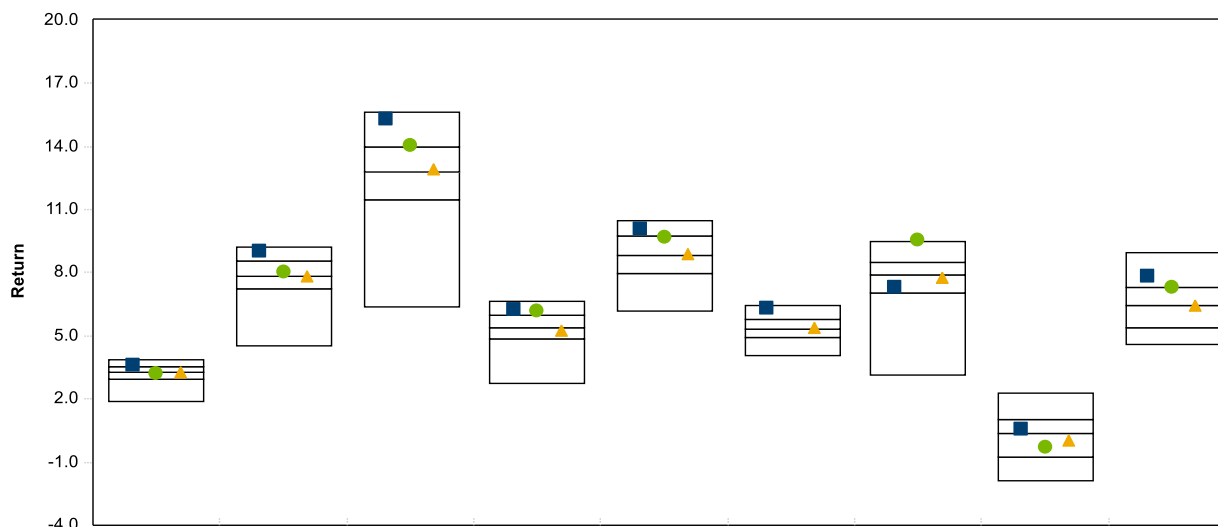
- The blue bars on the left show the relative weights to the policy targets (average monthly)
- The yellow bars in the chart in the middle quantify the impact of the relative weights – the overweight to fixed income detracted because it underperformed the other asset classes during the year
- The green bars represent the impact on Total Fund performance from the underlying asset class performance relative to the respective asset class benchmarks

Peer Performance Comparison

As of June 30, 2017

Plan Sponsor Peer Group Analysis

All Public Plans > \$1B-Total Fund

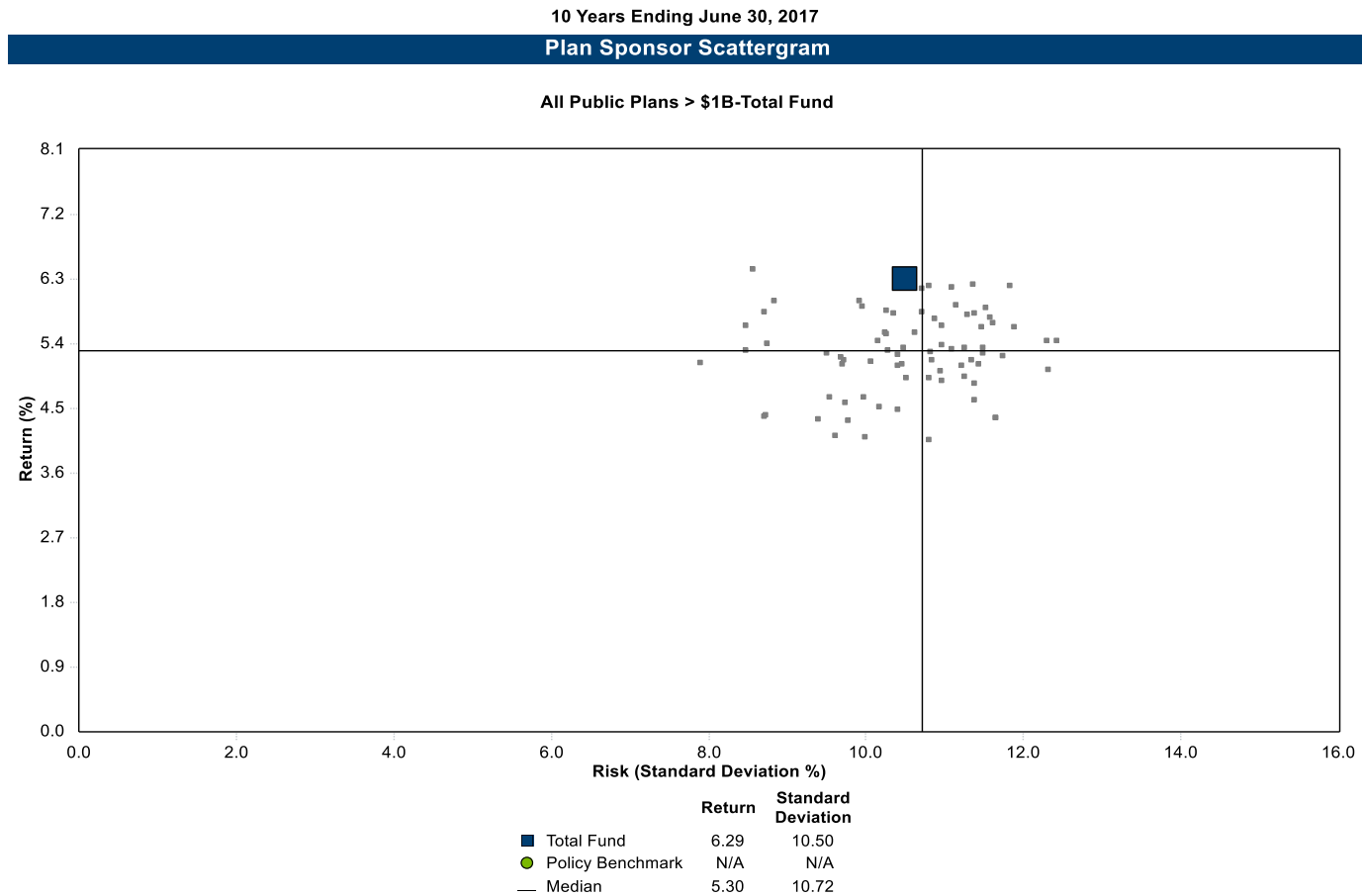


	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2016	2015	2014
■ Total Fund	3.6 (19)	9.0 (11)	15.3 (6)	6.3 (10)	10.1 (13)	6.3 (8)	7.3 (68)	0.6 (44)	7.8 (17)
● Policy Benchmark	3.2 (55)	8.0 (39)	14.1 (25)	6.2 (15)	9.7 (30)	-	9.6 (5)	-0.3 (65)	7.3 (26)
▲ Public Fund Index	3.3 (50)	7.8 (52)	12.9 (47)	5.3 (55)	8.9 (49)	5.4 (45)	7.8 (53)	0.1 (59)	6.5 (50)
5th Percentile	3.9	9.2	15.7	6.6	10.5	6.5	9.5	2.3	9.0
1st Quartile	3.5	8.5	14.0	6.0	9.8	5.8	8.5	1.0	7.3
Median	3.3	7.9	12.8	5.4	8.8	5.3	7.9	0.3	6.5
3rd Quartile	3.0	7.2	11.5	4.8	8.0	4.9	7.0	-0.8	5.4
95th Percentile	1.9	4.6	6.4	2.7	6.2	4.0	3.1	-1.9	4.6
Population	110	110	106	102	101	92	110	96	80

Parentheses contain percentile rankings.

Returns are gross of fees

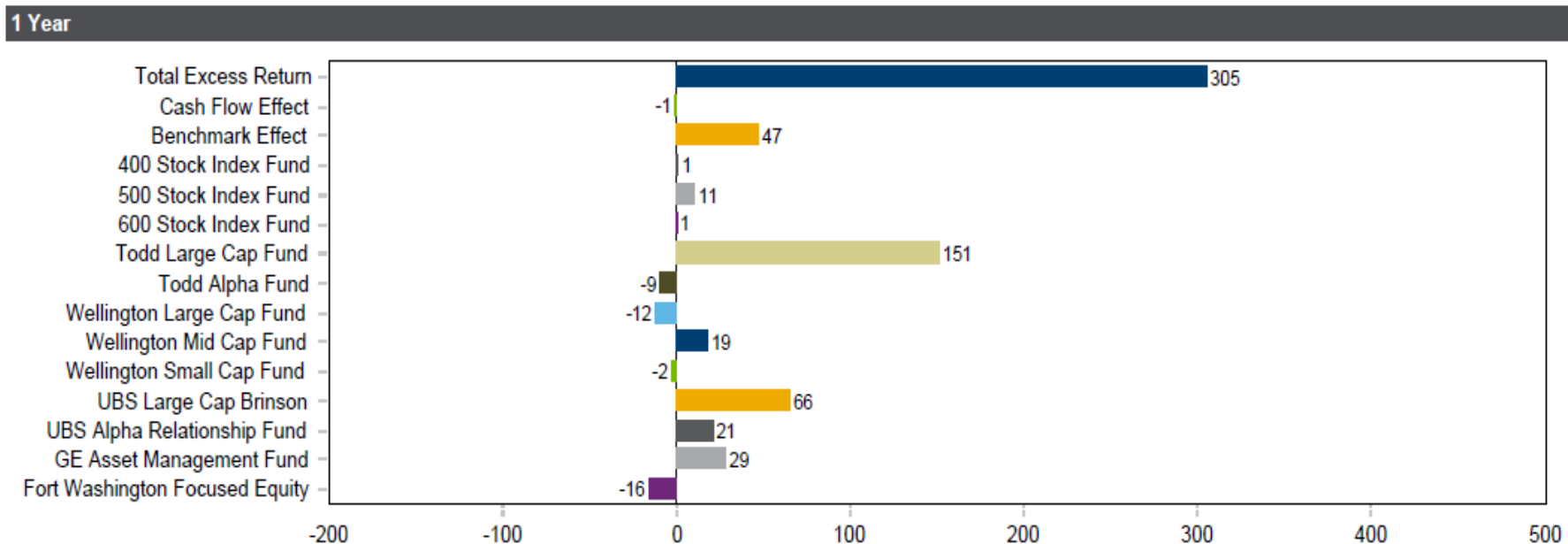
Risk-Return Peer Universe Comparison (10 Years Ending 6/30/2017)



Calculation based on quarterly periodicity.

Returns are gross of fees

Asset Class Attribution – U.S. Equity 1-Year Ending (6/30/17)



- The benchmark effect measures any impact style biases had on performance ((manager benchmark – total asset class benchmark) x manager weight in the asset class)
- The individual manager bars represent their contribution to asset class performance ((manager return – manager benchmark return) x manager weight in the asset class)

Best Practices in Performance Measurement - Summary

Best Practice	TRS
Measure performance relative to a policy benchmark (weighted average of policy targets and asset class benchmarks)	✓
Peer comparisons – absolute and risk adjusted	✓
Relative to long-term return assumptions	✓
Attribution analysis – total fund and asset classes	✓

- TRS has a comprehensive and methodical approach to performance measurement



Internal Controls

Presented by Michelle Deans, CPA



dependable, Trusted, Bold, Attentive, *Adaptive*, Progressive, **Resourceful**, Passion
engaged, Dynamic, *Leading*, Committed, Inspiring, Authentic, Committed, Posi
ocused, Inspiring, Thoughtful, Dependable, Trusted, **Bold**, Attentive, *Adaptive*, P

Key Agenda Items

- Internal control overview
- COSO 2013 Framework Overview
- COSO 2013 Framework:
 - Highlights
 - Areas of Focus
 - Observations on TRS

Internal Control: Core Definition

Internal control is a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting and compliance.

Internal Control: Core Definition

- Effective internal controls are geared toward three categories of objectives:
 - Operations Objectives
 - Reporting Objectives
 - Compliance Objectives

Internal Control: Key Elements

- Spirit of Transparency
- Culture of Accountability
- People of Integrity
 - Effected by people and actions at every level
- Adaptable to the Entity

Internal Control: Components

- Five (5) Interrelated Components:
 - Control environment
 - Risk assessment
 - Control activities
 - Information and communication
 - Monitoring

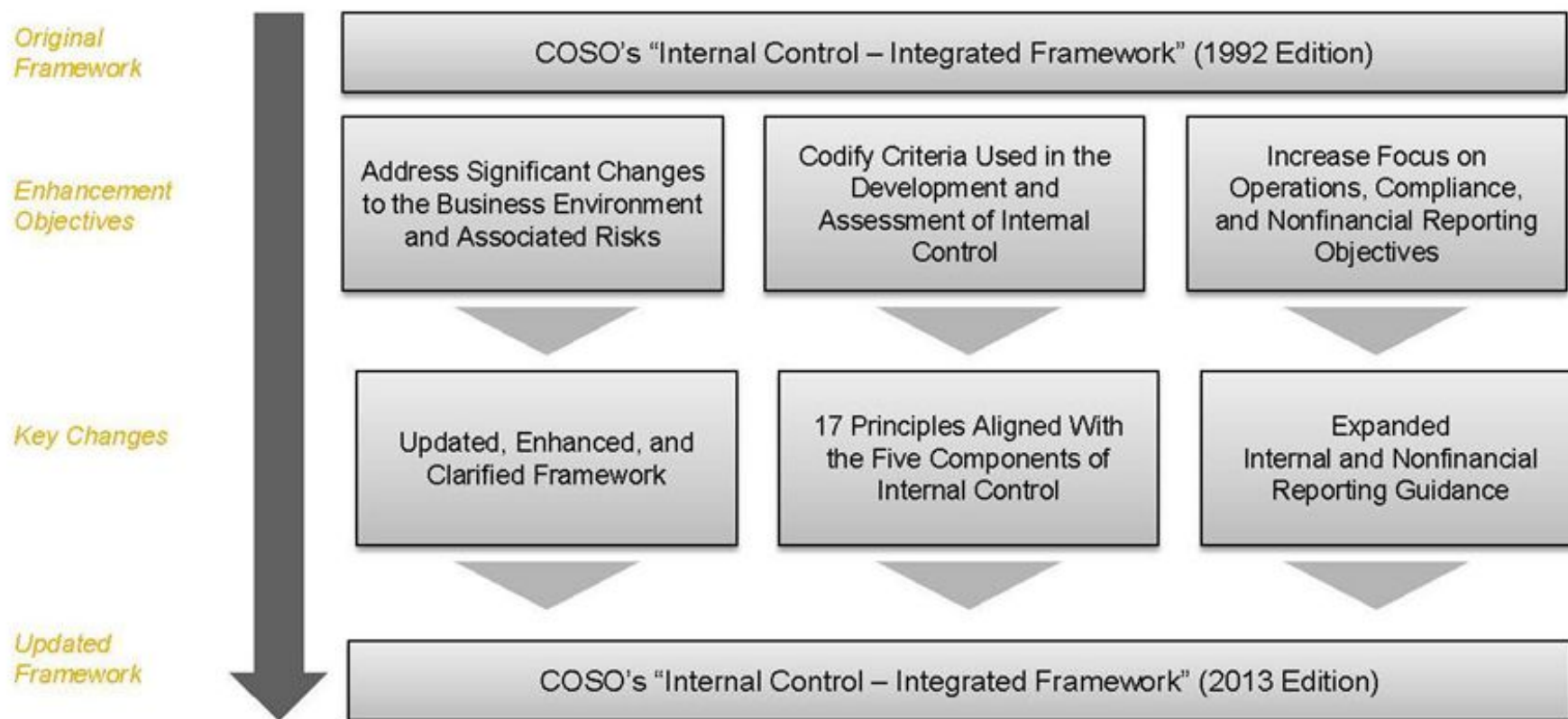
Financial Statement Audit Objectives

- Gain an understanding of internal controls relevant to financial statements in order to design effective audit procedures
- Not to express an opinion on the effectiveness of an entity's internal controls
- Requirement to report significant deficiencies and/or material weaknesses in controls over financial reporting if identified in the performance of the audit

COSO 2013 Framework



2013 Framework Overview: Project Objectives



2013 Framework Overview: Key Changes

- The addition of 17 principles underlying the original five components of internal control
- Considerations related to changes in business, operating, and regulatory environments
- Expanded reporting objectives to include other important forms of reporting
- Reflects increased relevance of technology
- Enhanced focus on risk of fraud
- Additional approaches and examples relevant to operations, compliance, and nonfinancial reporting objectives

2013 Framework Highlights: Key Terms

- Present and Functioning
 - Applies to both component and principal
 - Present
 - Effective design and implementation
 - Functioning
 - Operating effectiveness
- Operating Together
 - Five components of internal control should function together versus function independent of one another
 - Assessment has to be made under new framework to conclude controls are present and functioning

Key Areas of Focus

- **Risk Assessment**
 - More detailed assessment
 - Focus on fraud
- **Outsource Service Providers**
 - Included in 12 of 17 principals
 - SOC report assessments
 - Need to assess user controls
 - Vendor management programs



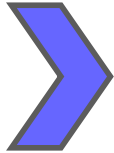
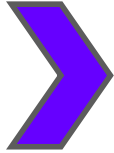

Key Areas of Focus (continued)

- **Information Technology**
 - Enhanced emphasis and reliance
 - Included in 14 out of 17 principals
 - Look to leverage so as to reduce manual controls

Key Areas of Focus (continued)

- **Information Technology**
 - IT still retains its own Framework (COBIT)
 - IT is pervasive
 - The IT General Control Environment is an entity-level control
 - Must be effective before you can place reliance on application controls within your system

COSO's Codification of Framework Principles

Control Environment		<ol style="list-style-type: none"> 1. Demonstrates commitment to integrity and ethical values 2. Exercises oversight responsibility 3. Establishes structure, authority, and responsibility 4. Demonstrates commitment to competence 5. Enforces accountability
Risk Assessment		<ol style="list-style-type: none"> 6. Specifies suitable objectives 7. Identifies and analyzes risk 8. Assesses fraud risk 9. Identifies and analyzes significant changes
Control Activities		<ol style="list-style-type: none"> 10. Selects and develops control activities 11. Selects and develops general controls over technology 12. Deploys through policies and procedures
Information and Communications		<ol style="list-style-type: none"> 13. Uses relevant information 14. Communicates internally 15. Communicates externally
Monitoring Activities		<ol style="list-style-type: none"> 16. Conducts ongoing and/or separate evaluations 17. Evaluates and communicates deficiencies

Control Environment Principles and Attributes

1. The organization demonstrates a commitment to integrity and ethical values.
 - Sets the tone at the top
 - Establishes standards of conduct
 - Evaluates adherence to standards of conduct
 - Addresses deviations in a timely manner

Control Environment Principles and Attributes (continued)

2. The board of directors demonstrates independence of management and exercises oversight for the development and performance of internal control.
 - Establishes board of directors oversight responsibilities
 - Applies relevant expertise
 - Operates independently
 - Provides oversight

Control Environment Principles and Attributes (continued)

3. Management establishes, with board oversight, structures, reporting lines, and appropriate authorities and responsibilities in the pursuit of objectives.
 - Considers all structures of the entity
 - Establishes reporting lines
 - Defines, assigns, and limits authorities and responsibilities

Control Environment Principles and Attributes (continued)

4. The organization demonstrates a commitment to attract, develop, and retain competent individuals in alignment with objectives.
 - Establishes policies and practices
 - Evaluates competence and addresses shortcomings
 - Plans and prepares for succession

Control Environment Principles and Attribute (continued)

5. The organization holds individuals accountable for their internal control responsibilities in the pursuit of objectives.
- Enforces accountability through structures, authorities, and responsibilities
 - Establishes performance measures, incentives, and rewards
 - Evaluates performance measures, incentives, and rewards for ongoing relevance
 - Evaluates performance and rewards or disciplines individuals

Risk Assessment Principles and Attributes

6. The organization specifies objectives with sufficient clarity to enable the identification and assessment of risks relating to objectives.
- Operations Objectives
 - External Financial Reporting Objectives
 - External Non Financial Reporting Objectives
 - Internal Reporting Objectives
 - Compliance Objectives

Risk Assessment Principles and Attributes (continued)

7. The organization identifies risks to the achievement of its objectives across the entity and analyzes risks as a basis for determining how the risks should be managed.
 - Includes entity, subsidiary, division, operating unit, and functional levels
 - Analyzes internal and external factors
 - Involves appropriate levels of management
 - Estimates significance of risks identified
 - Determines how to respond to risks

Risk Assessment Principles and Attributes (continued)

8. The organization considers the potential for fraud in assessing risks to the achievement of objectives.
 - Considers various types of fraud
 - Assesses incentives and pressures, opportunities, attitudes and rationalizations

Risk Assessment Principles and Attributes (continued)

9. The organization identifies and assesses changes that could significantly impact the system of internal control.
 - Assesses changes in the external environment, changes in the business model, and changes in leadership

Control Activities Principles and Attributes

10. The organization selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels.

- Considers entity-specific factors
- Determines relevant business processes
- Evaluates a mix of control activity types
- Considers at what level activities are applied
- Addresses segregation of duties

Control Activities Principles and Attributes (continued)

11. The organization selects and develops general control activities over technology to support the achievement of objectives.

- Determines dependency between the use of technology in business processes and technology general controls
- Establishes relevant technology infrastructure control activities
- Establishes relevant security management process control activities
- Establishes relevant technology acquisition, development, and maintenance process control activities

Control Activities Principles and Attributes (continued)

12. The organization deploys control activities through policies that establish what is expected and procedures that put policies into action.

- Establishes policies and procedures to support deployment of management directives
- Establishes responsibility and accountability for executing policies and procedures
- Performs in a timely manner
- Takes corrective action
- Performs using competent personnel
- Reassesses policies and procedures

Information and Communication Principles and Attributes

13. The organization obtains or generates and uses relevant, quality information to support the functioning of internal controls.

- Identifies information requirements
- Captures internal and external sources of data
- Processes relevant data into information
- Maintains quality throughout processing
- Considers costs and benefits

Information and Communication

Principles and Attributes (continued)

14. The organization internally communicates information, including objectives and responsibilities for internal control, necessary to support the functioning of internal control.
- Communicates internal control information with personnel and the board of directors
 - Provides separate communication lines and selects relevant methods of communication

Information and Communication Principles and Attributes (continued)

15. The organization communicates information with external parties regarding matters affecting the functioning of internal control.

- Communicates to and from external parties and with the board of directors
- Provides separate communication lines and selects relevant methods of communication

Monitoring Activities Principles and Attributes

16. The organization selects, develops, and performs ongoing and/or separate evaluations to ascertain whether the components of internal control are present and functioning.

- Considers a mix of ongoing and separate evaluations
- Considers rate of change
- Establishes baseline understanding
- Uses knowledgeable personnel
- Integrates with business processes
- Adjusts scope and frequency
- Objectively evaluates

Monitoring Activities Principles and Attributes (continued)

17. The organization evaluates and communicates internal control deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the board of directors, as appropriate.
- Assesses results
 - Communicates deficiencies
 - Reports deficiencies to senior management and the board of directors
 - Monitors corrective actions

Thank You

Michelle Deans (859) 514-7772

Michelle.Deans@mcmcpa.com

502.749.1900
www.mcmcpa.com



AFTER THE “GREAT RESET”

CURT SCOTT, CFA
TODD ASSET MANAGEMENT
NOVEMBER 20, 2017



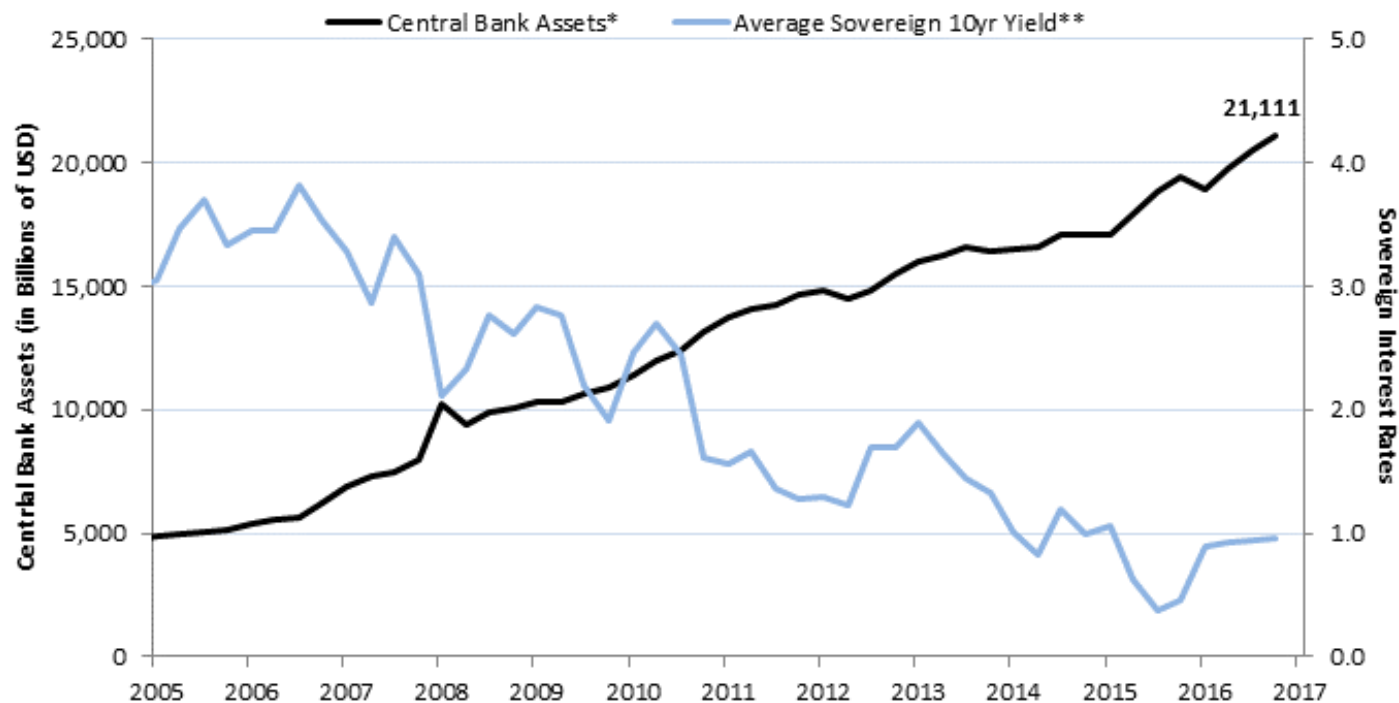
101 S. 5TH ST., SUITE 3100, LOUISVILLE, KENTUCKY 40202
(502) 585-3121 · (888) 544-8633 · FAX (502) 585-4203 · TODDASSET.COM

GROWTH HEADWINDS EASE AFTER “GREAT RESETS”

- **Corporate Debt Declined**
- **Consumer Debt Declined**
- **Commodities/Currencies Adjusted**
- **Chinese Rebalancing to Consumption**
- **Populism Prompts Pro-Growth Policies**
- **Regulatory Burdens Easing**

GLOBAL CENTRAL BANKS PURCHASED BONDS, PUSHING RATES LOWER

Global Central Bank Assets and Interest Rates

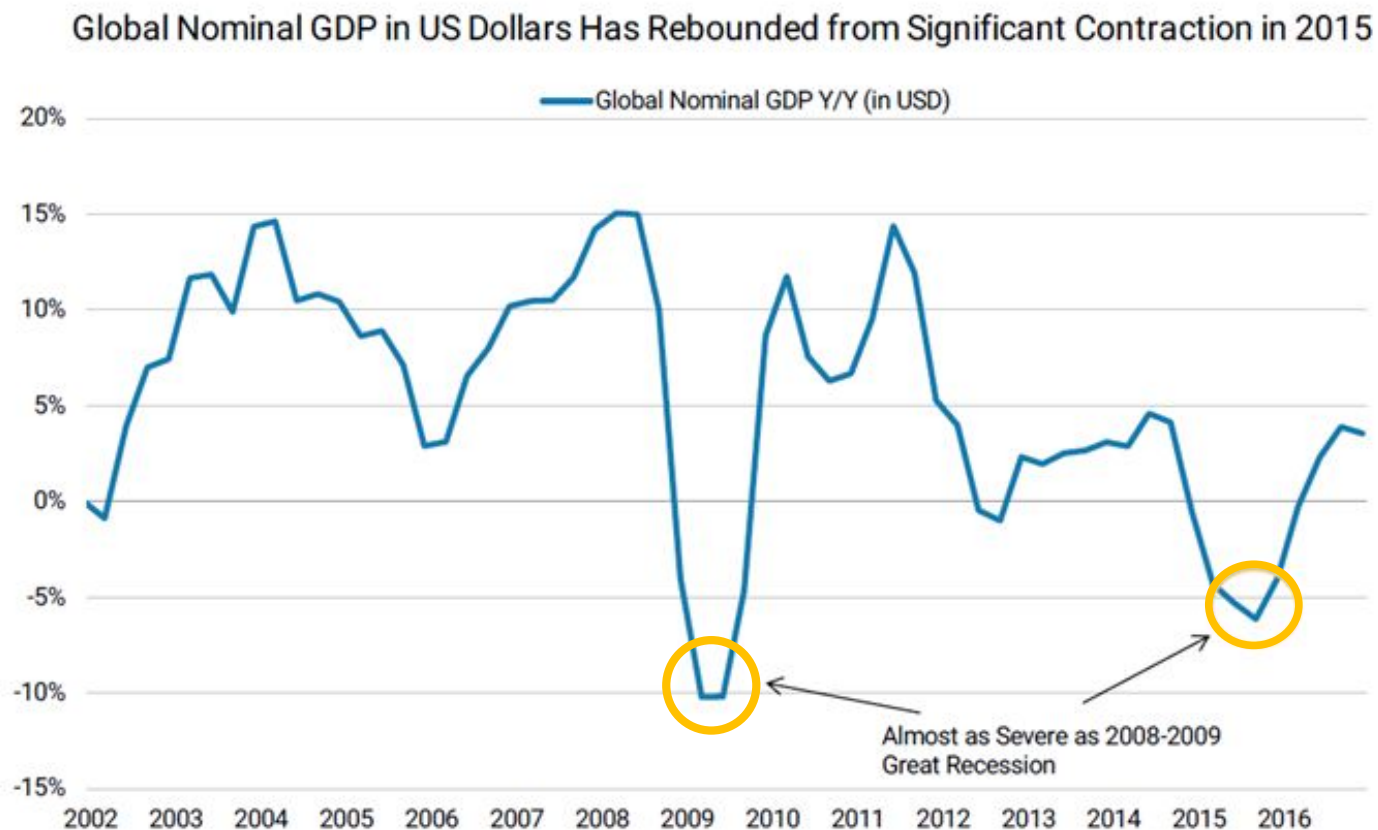


*Aggregate Assets of the US Fed, Bank of Canada, ECB, BOE, BOJ, SNB, People's Bank of China and Reserve Bank of Australia
BOE stopped reporting Total Assets in September of 2014. We have kept the BOE Total Asset figure static from that point on.

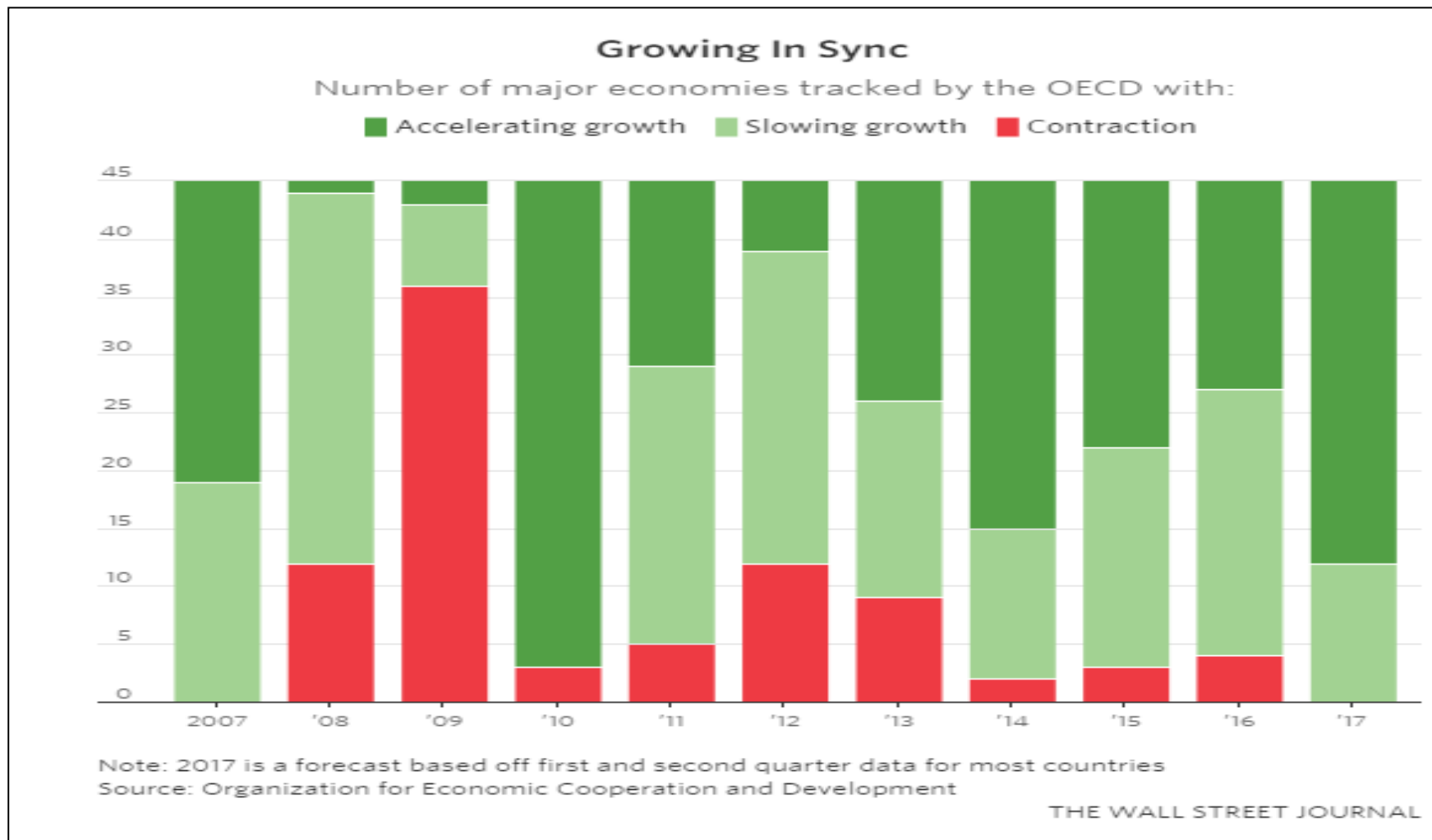
**Average 10yr yield of the US, Japan and Germany.

Data as of 9/30/2017

GLOBAL RECESSION IS OVER

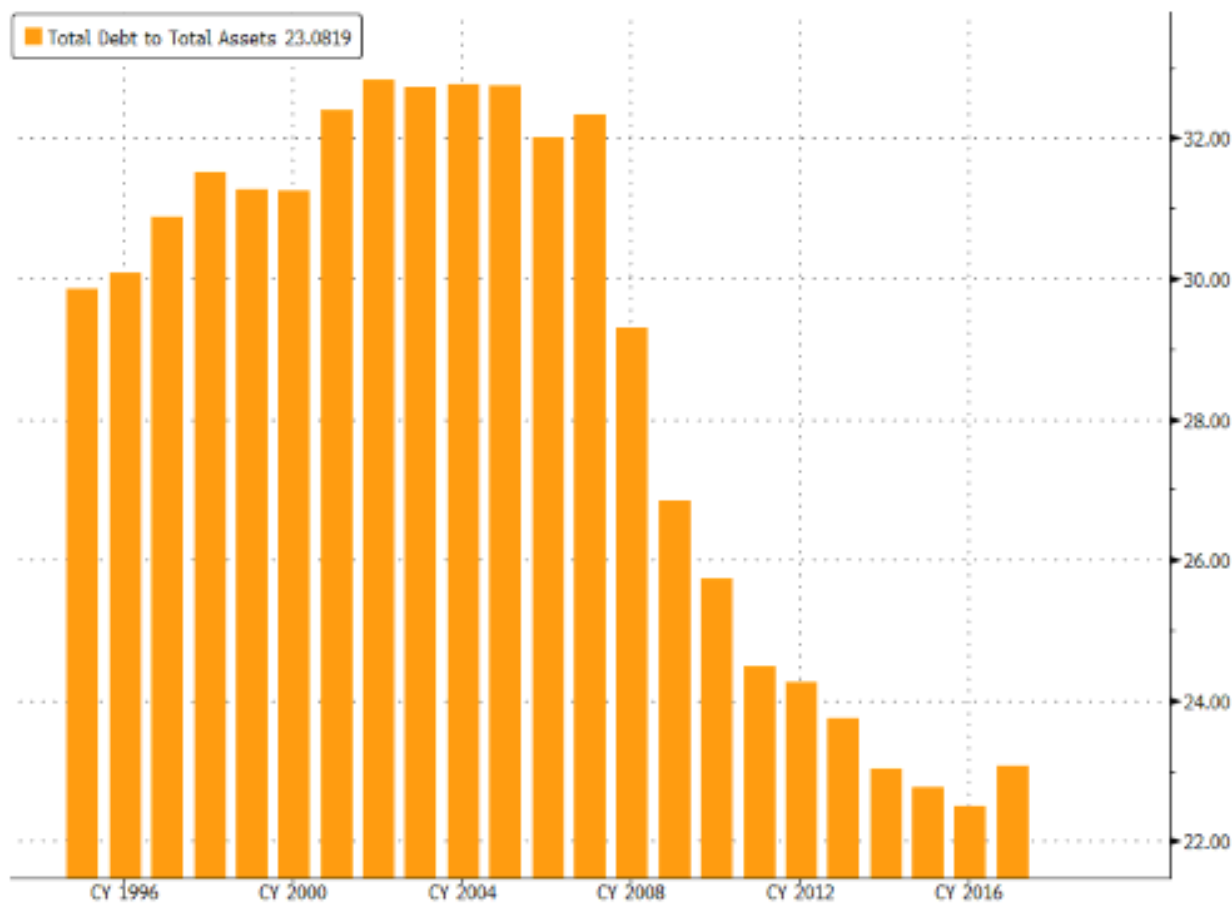


SYNCHRONIZED GROWTH-THE BEST ECONOMY IN YEARS



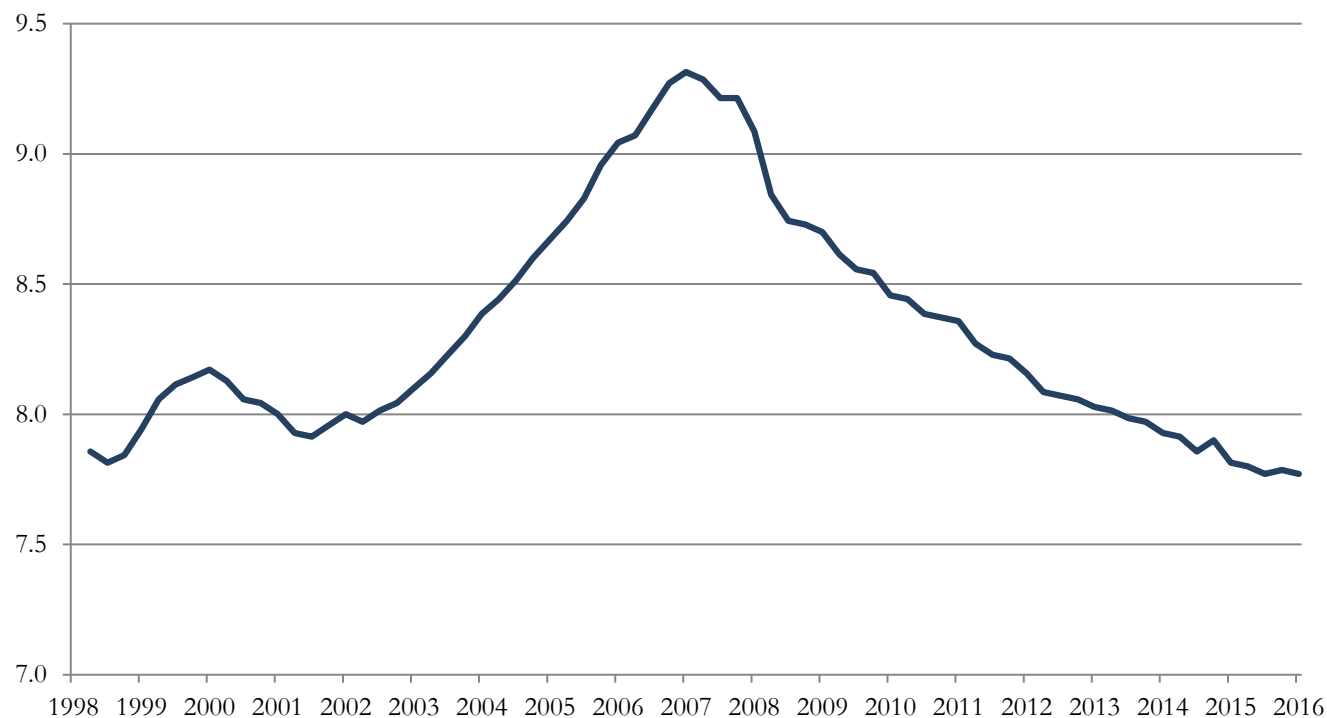
RESET: GLOBAL CORPORATIONS PAID DOWN DEBT

MSCI All Country World Index Debt to Assets



RESET: CONSUMERS DELEVERAGING SEEMS COMPLETE

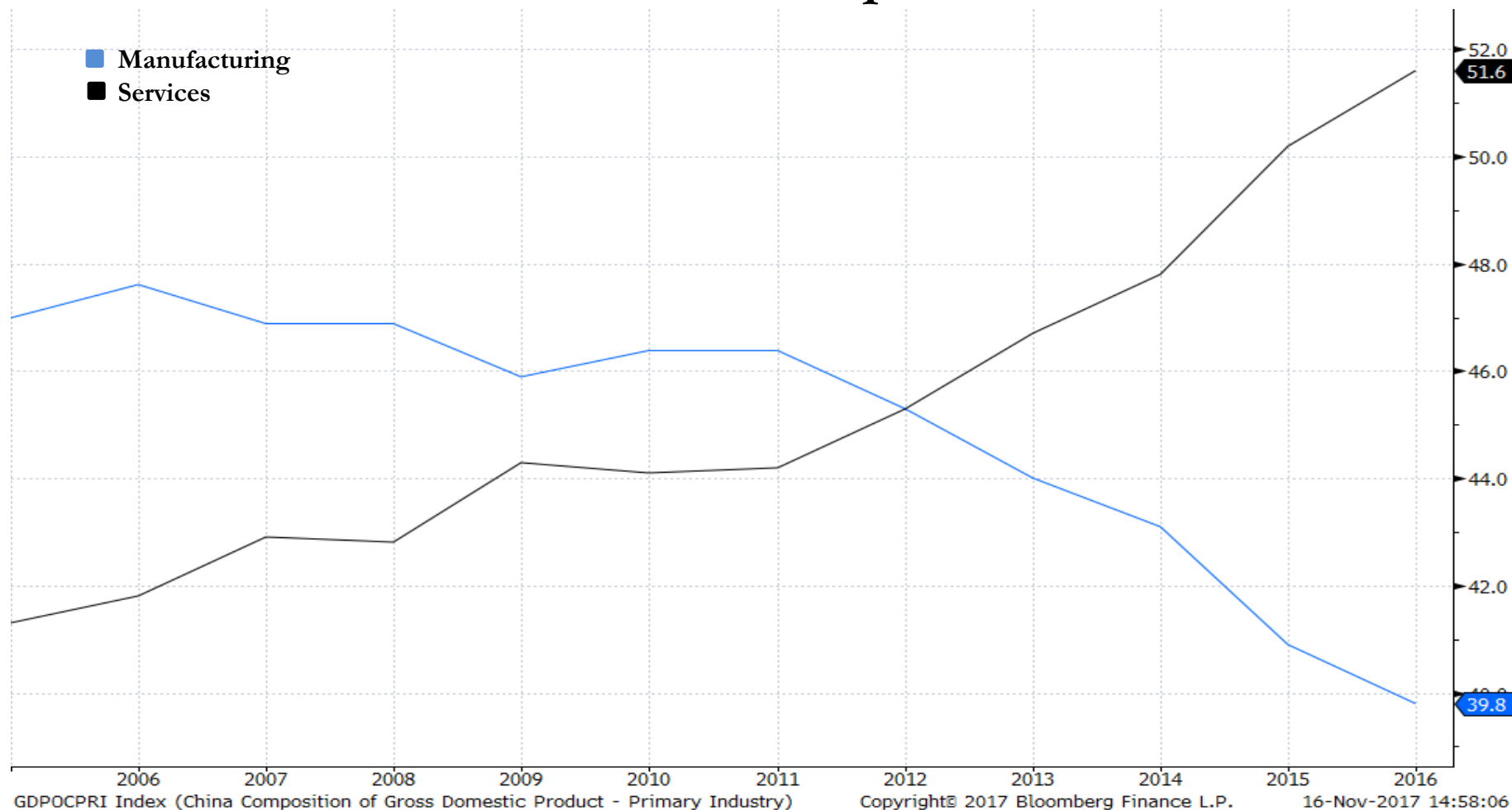
Average Household Debt Service Ratio for G7 Countries



G7: Canada, France, Germany, Italy, Japan, United Kingdom and United States.
Debt Service Ratio: Interest payments and amortizations divided by income.

RESET: CHINA REBALANCING TOWARDS CONSUMPTION

China GDP Composition



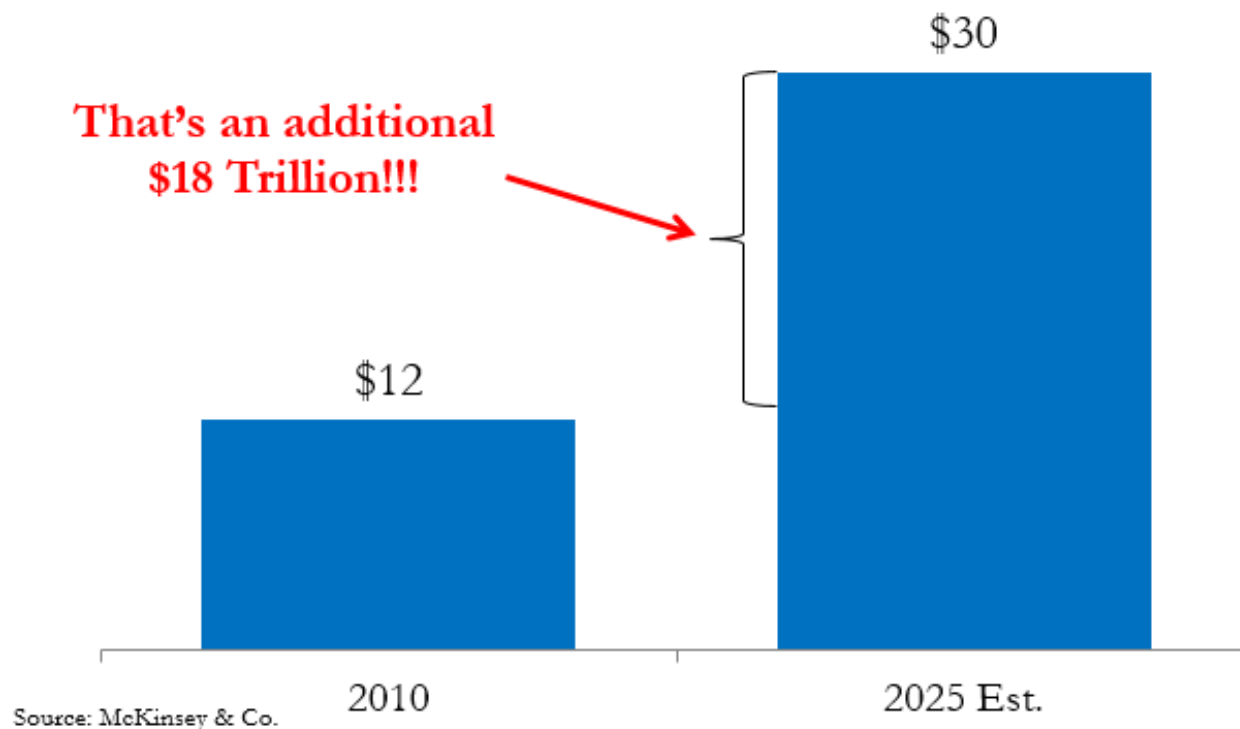
Source: Bloomberg and National Bureau of Statistics

Figures above do not total 100. Agriculture represents the remaining 9% of China's GDP.

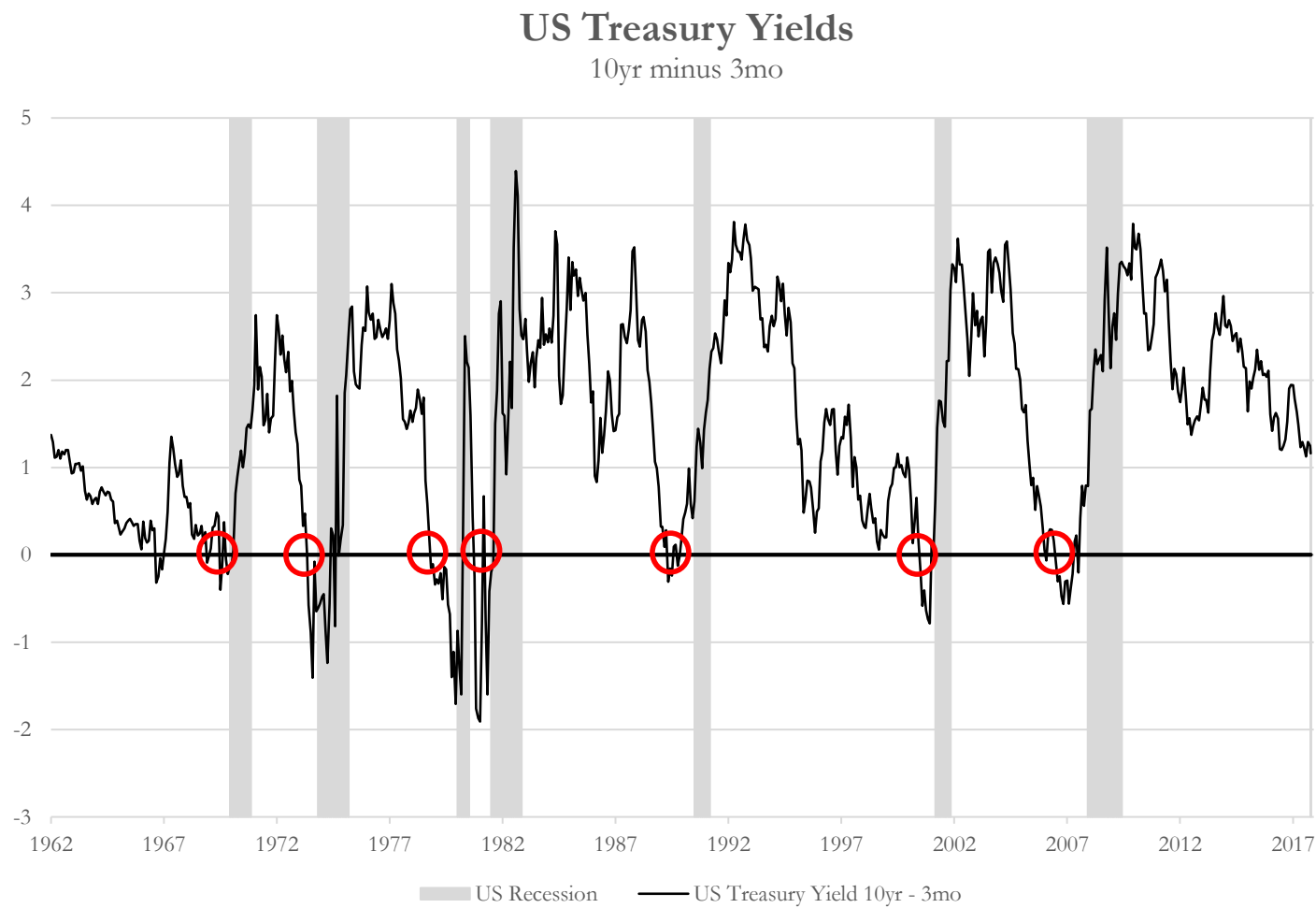
EMERGING MARKET CONSUMPTION IS A HUGE GROWTH DRIVER

The World's Going to Need a Bigger Wallet- Todd Chart of Interest

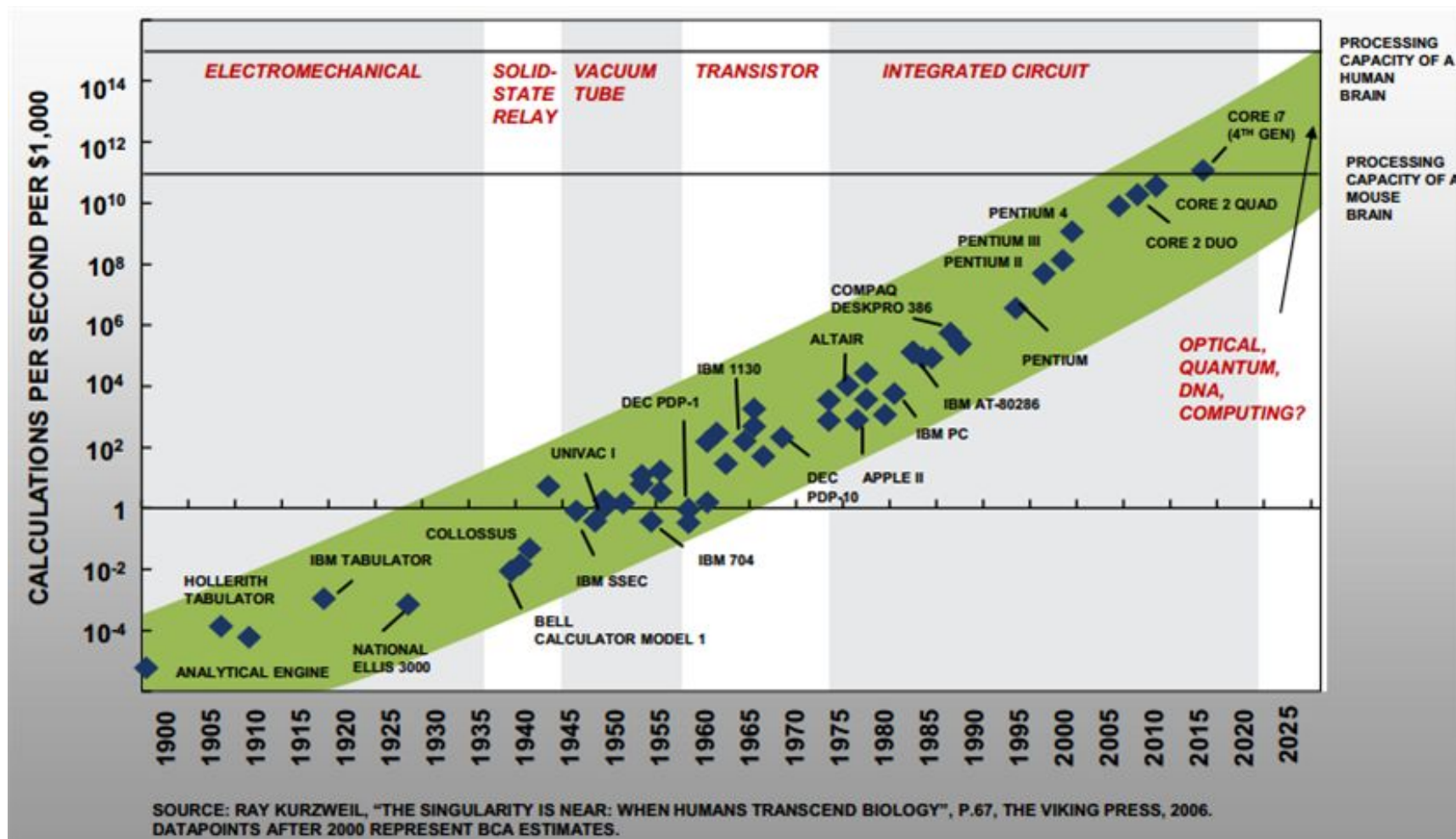
Emerging Market Consumptions (\$Trillions)



TREASURY SPREADS ARE NOT FORECASTING A RECESSION



OPPORTUNITY: TECHNOLOGICAL INNOVATION

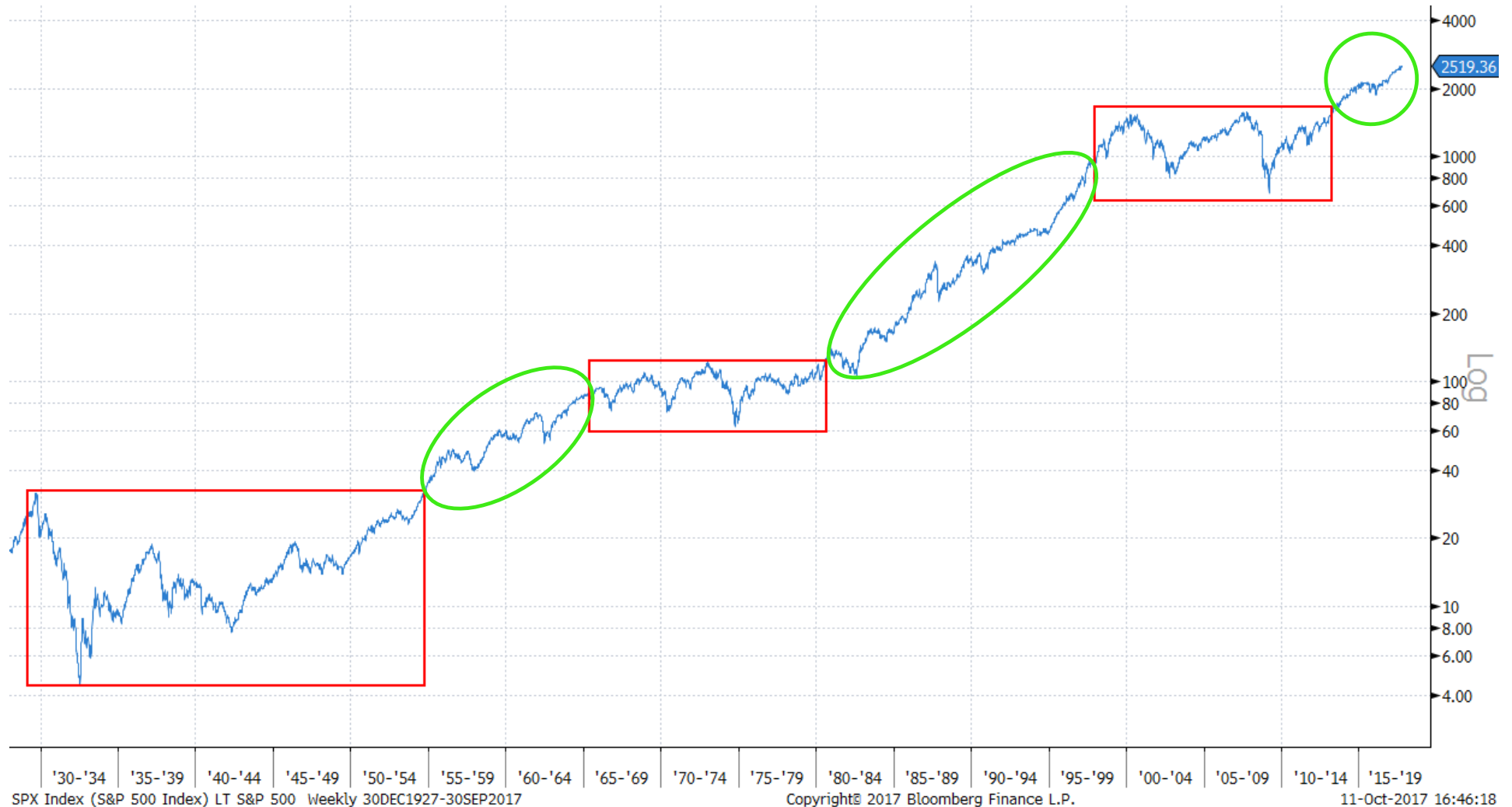


THEMES TO CONSIDER

- **EM Consumption**
- **Technology Innovation/Adoption**
- **“Great Reset” after Financial Crisis is Complete**
- **Developed Economies Pent Up Demand**
- **Shift from Monetary to Fiscal Stimulus**

MARKET CYCLES- TRADING RANGES FOLLOWED BY SECULAR BULLS

S&P 500 Index 1927-2017

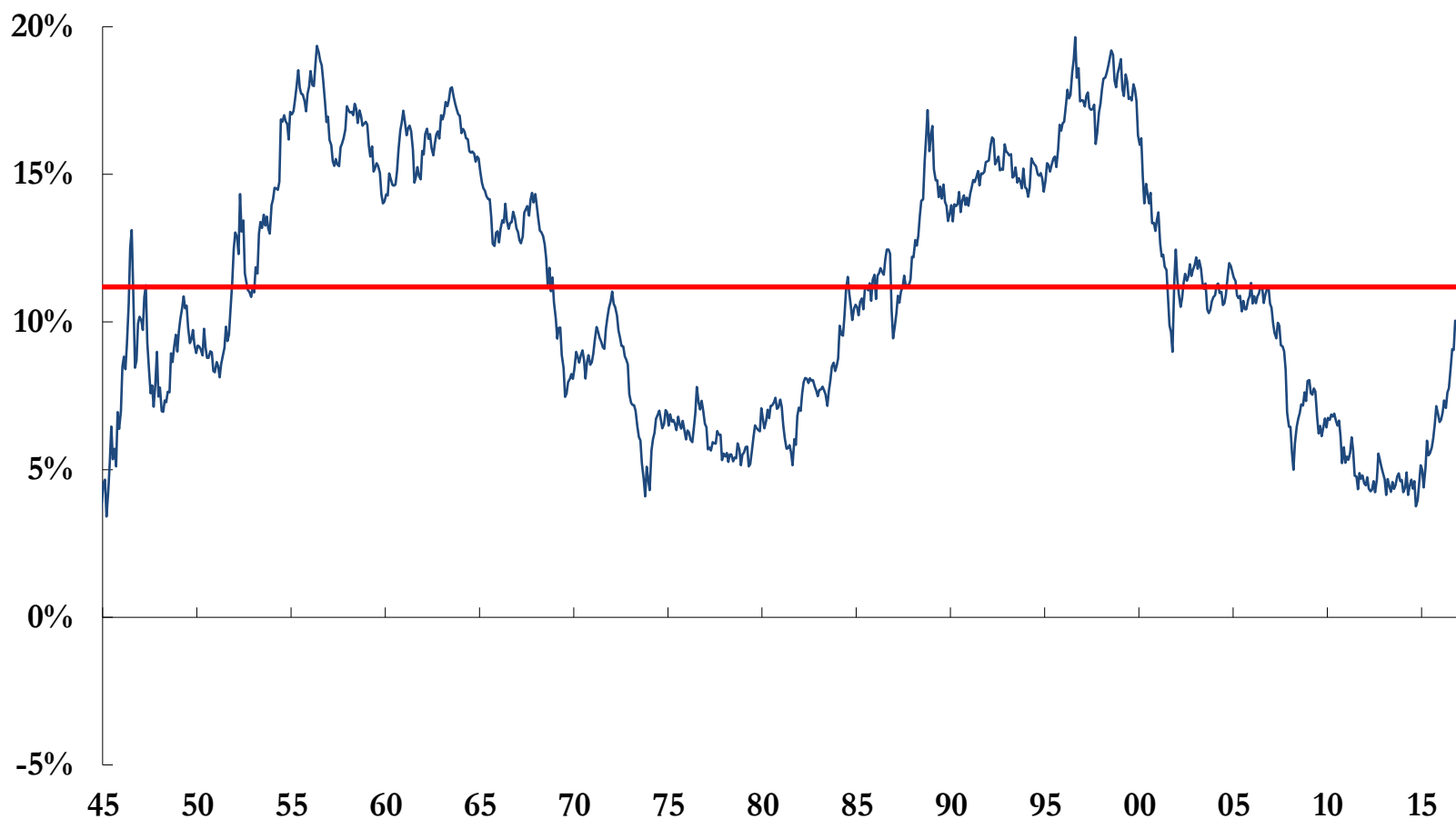


Past performance does not guarantee future results.
The S&P 500 Index is an unmanaged index and is unavailable for direct investment.
Source: Bloomberg, TAM

A SECULAR WAVE TOWARDS STOCKS CONTINUES

S&P 500 Rolling 15 Year Annualized Total Returns

As of 9/30/2017



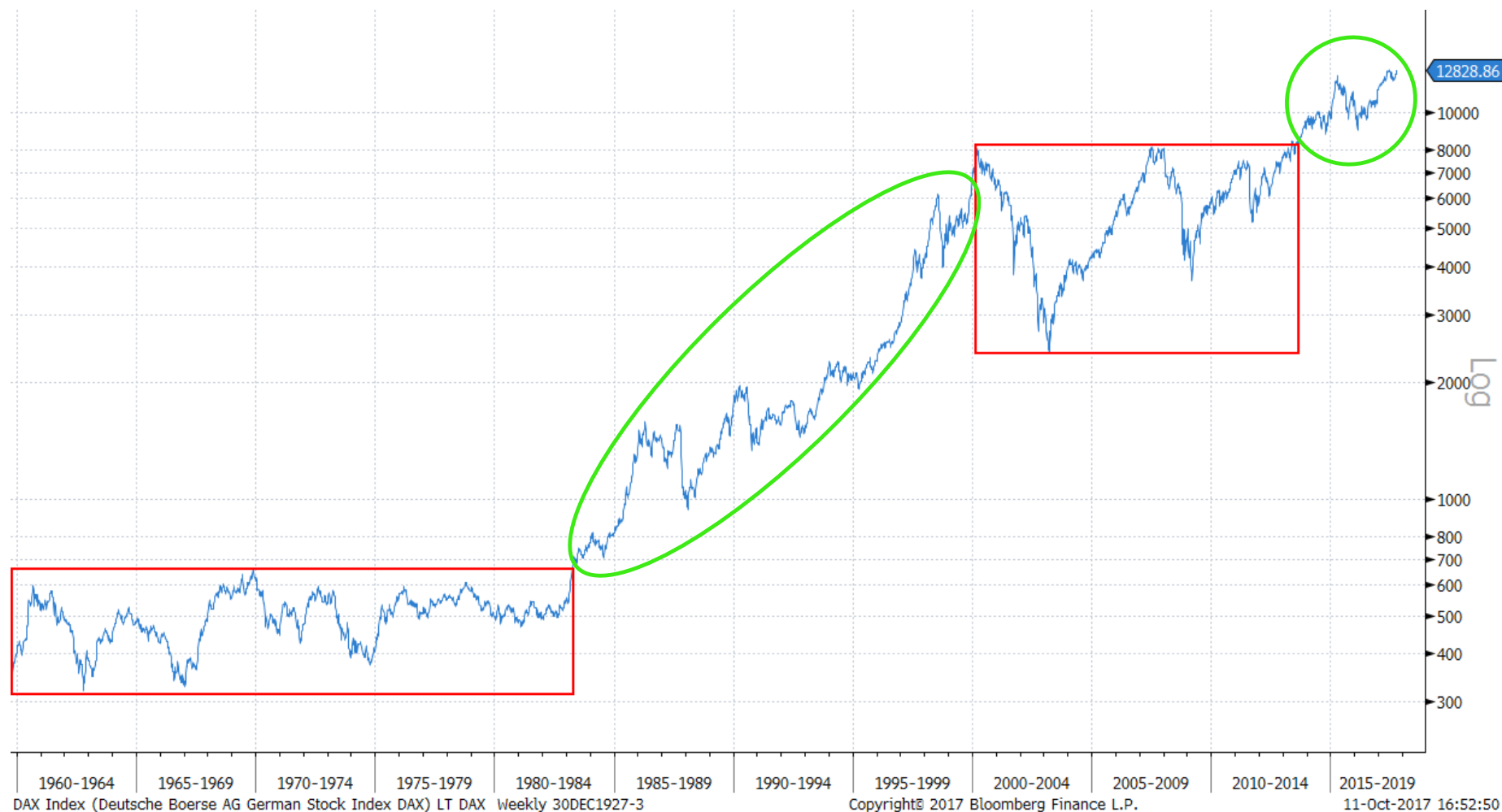
Source: Bloomberg



Source: Bloomberg and Todd Asset Management based on monthly calculations

GERMANY- A NEW SECULAR BULL MARKET

DAX Index 1961-2017



Past performance does not guarantee future results.
The DAX Index is an unmanaged index and is unavailable for direct investment.

Source: Bloomberg, TAM

THE UK- A SECULAR BULL STARTS POST BREXIT

FTSE 100 Index 1983-2017



Past performance does not guarantee future results.
The FTSE 100 Index is an unmanaged index and is unavailable for direct investment.

Source: Bloomberg, TAM

HONG KONG- HINTING AT A SECULAR BULL?

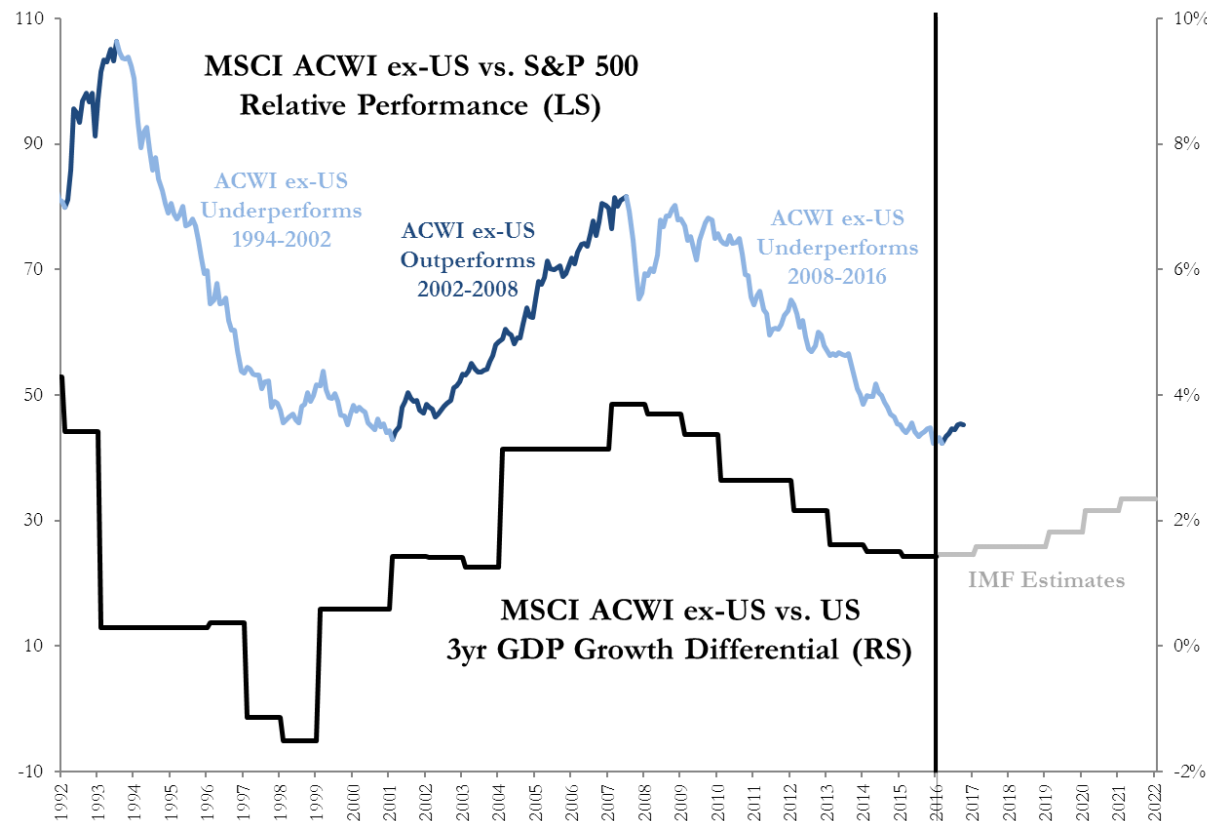
Hong Kong Hang Seng Index 1965-2017



Past performance does not guarantee future results.
The Hong Kong Hang Seng Index is an unmanaged index and is unavailable for direct investment.
Source: Bloomberg, TAM

TIME TO LEARN A FOREIGN LANGUAGE

TODD'S CHART OF INTEREST: MAY 10, 2017



* GDP is derived from IMF data and represents the difference in the 3 year annualized growth rate of GDP based on PPP between countries in the MSCI ACWI ex-US and the US.

Source: IMF, MSCI and Todd Asset Management. See performance disclosure for additional information on benchmarks presented.

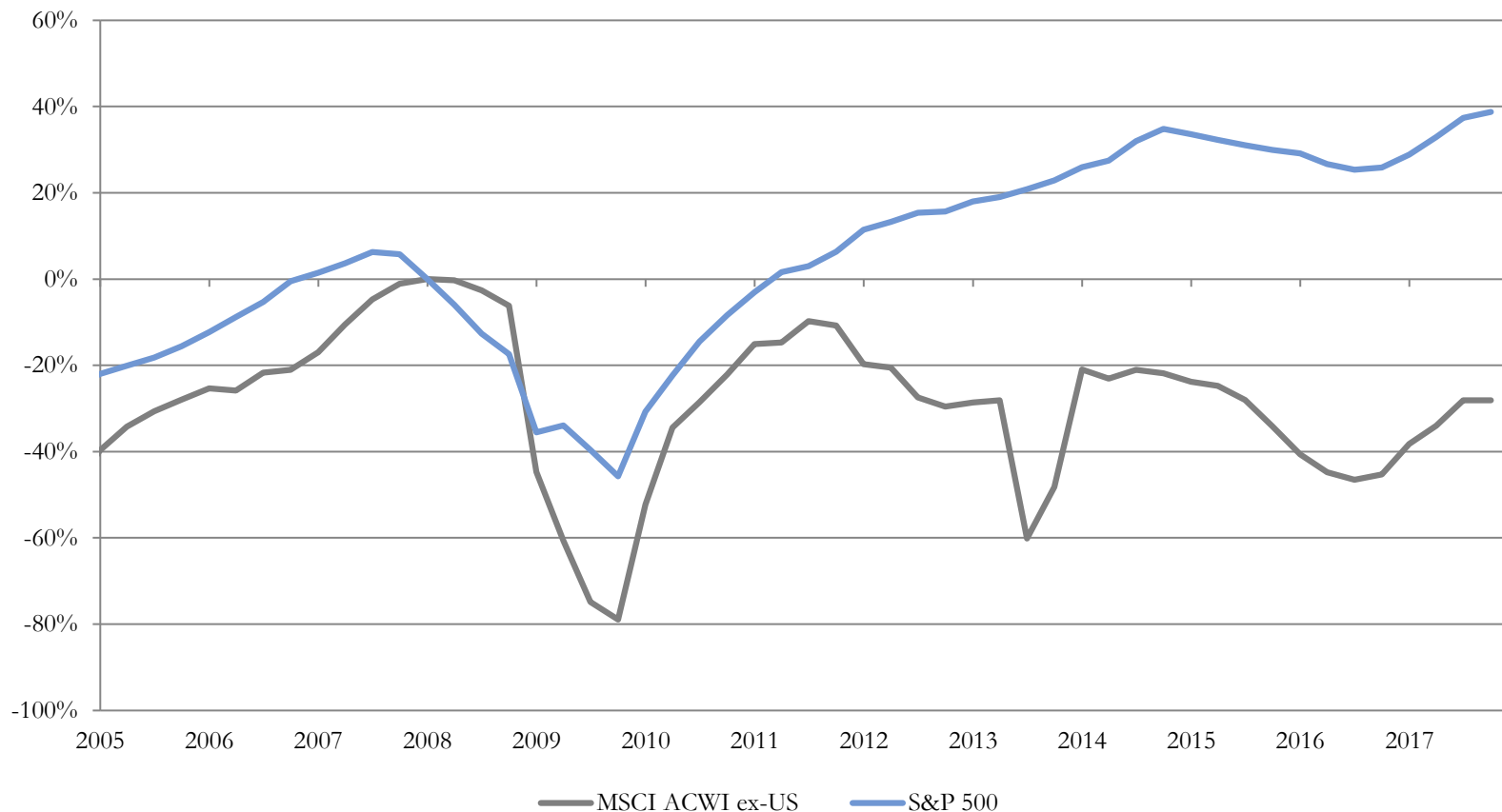


The "Todd's Chart of Interest" publication has been distributed for informational purposes only and should not be considered as investment advice or a recommendation of any particular security, strategy or investment product. Past performance does not provide any guarantee of future performance., and one should not rely on performance as an indication of future performance. Commentary may contain subjective judgements and assumptions subject to change without notice. There can be no assurance that developments will transpire as forecast. Information contained herein has been obtained from sources believed to be reliable but are not guaranteed. No part of this publication may be reproduced in any form, or referred to in any other publication, without express written permission of Todd Asset Management LLC © 2017.

US EARNINGS HAVE RECOVERED, ACWI EX-US HAVE NOT

Data as of 9/30/2017

Trailing 12-mo EPS MSCI ACWI ex-US vs. S&P 500 Indexed to pre-Crisis Peak (12/31/2007)

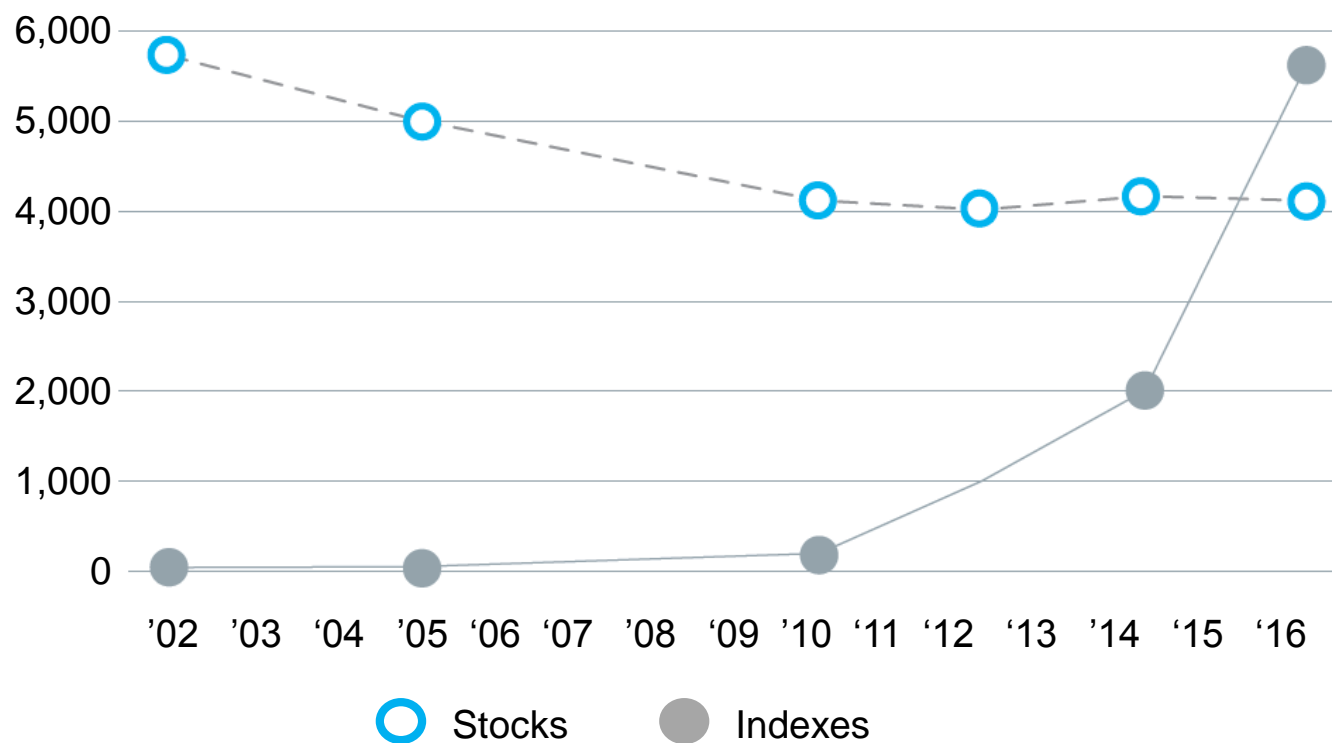


Source: Bloomberg, MSCI and Todd Asset Management

Earnings were indexed to 100 on 12/31/2007 to correspond with the peak of MSCI ACWI ex-US Trailing 12-mo EPS. The chart shows the percent change from the peak on 12/31/2007 for both the MSCI ACWI ex-US and S&P 500 EPS.

A PASSIVE BUBBLE?

MORE INDEXES THAN STOCKS IN THE U.S.





Q & A



DISCLOSURE PRESENTATIONS

Disclosures

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