



# TEACHERS' RETIREMENT SYSTEM

## of the State of Kentucky

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Special Meeting of the

TRS Board of Trustees

### AGENDA

Monday, November 19, 2018

8:30	Continental Breakfast	
9	Introduction	Gary Harbin
9:30	Actuary:	Alisa Bennett
	• Executive Budget Impact on Health Insurance	Cavanaugh Macdonald
	• Actuarial Assumptions	
10:30	Break	
10:45	Fiduciary and Ethics Overview	Beau Barnes
11:30	Lunch (including discussion concerning investment program)	Gary Harbin Tom Siderewicz
1	Aon Review of Investment Program	Jeanna Cullins Mike McCormick Aon Hewitt Investment Consulting
2	Coriell Pharmacogenomics Project	Scott Megill Coriell Life Sciences Jane Gilbert
2:45	Break	
3	Economic Outlook	Curt Scott Todd Asset Management
4	Open discussion concerning administrative operations	Gary Harbin

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



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# Trustee Workshop

Alisa Bennett, FSA, EA, FCA, MAAA  
November 19, 2018



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Medical Insurance  
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and Methods

ASOP 51

# Medical Insurance Fund (MIF)



# ***Key Results for 2018***

## ***Medical Insurance Fund***



- Funded status has improved for the Medical Insurance Fund (MIF).
  - From 26.7% to 36.3%.
- Total contribution rate has decreased for the MIF
  - From 7.01% to 5.82%.
  - Mainly due to decrease in Medicare Advantage rates
- Target Rate of Return for the MIF is 8.00%.
  - Market Value Return of 8.67%.
  - Actuarial Value of Asset Return of 6.71%.
    - Reflects smoothing of investment gains and losses over 5-year period.

# ***Medical Insurance Fund Shared Responsibility***



- Medical Insurance Fund (MIF) Stabilization Contribution – Shared Responsibility
  - Pays the cost of health insurance coverage for retirees who are not eligible for Medicare and who retire on or after July 1, 2010, less the amounts that are otherwise required to be paid by the retirees.
  - May be suspended or adjusted by the General Assembly if in its judgment the welfare of the Commonwealth so demands.

# ***Medical Insurance Fund Shared Responsibility***



- Current assumed rate of return on MIF assets is 8.00%.
- If State does not make shared responsibility payments going forward, due to the decreased contribution to fund the MIF, the asset allocations may have to be changed to be more liquid and earn a lower return.
- For funding purposes, assumed rate of return on assets could be 6.50%.

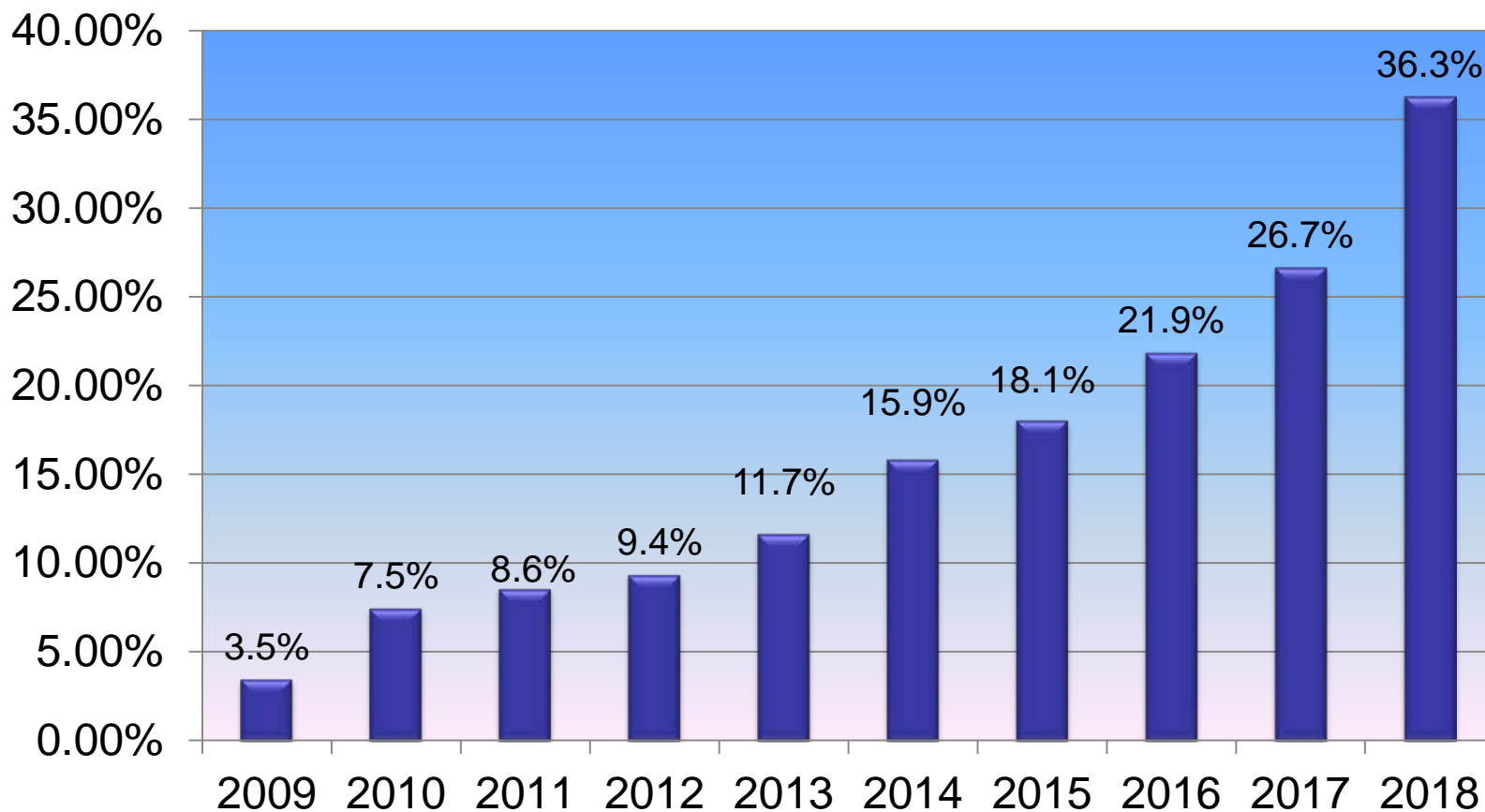
# ***Medical Insurance Fund Shared Responsibility***



- Even assuming an 8.00% rate of return, without the State shared responsibility payments, for GASB 74/75 purposes, Fiduciary Net Position (FNP) would be projected to be depleted in 2040 and an the Single Equivalent Interest Rate (SEIR) of 4.88% would need to be used in the determination of the Total OPEB Liability (TOL) for disclosure purposes.

# ***Historical Funded Percentage***

## ***Medical Insurance Fund***

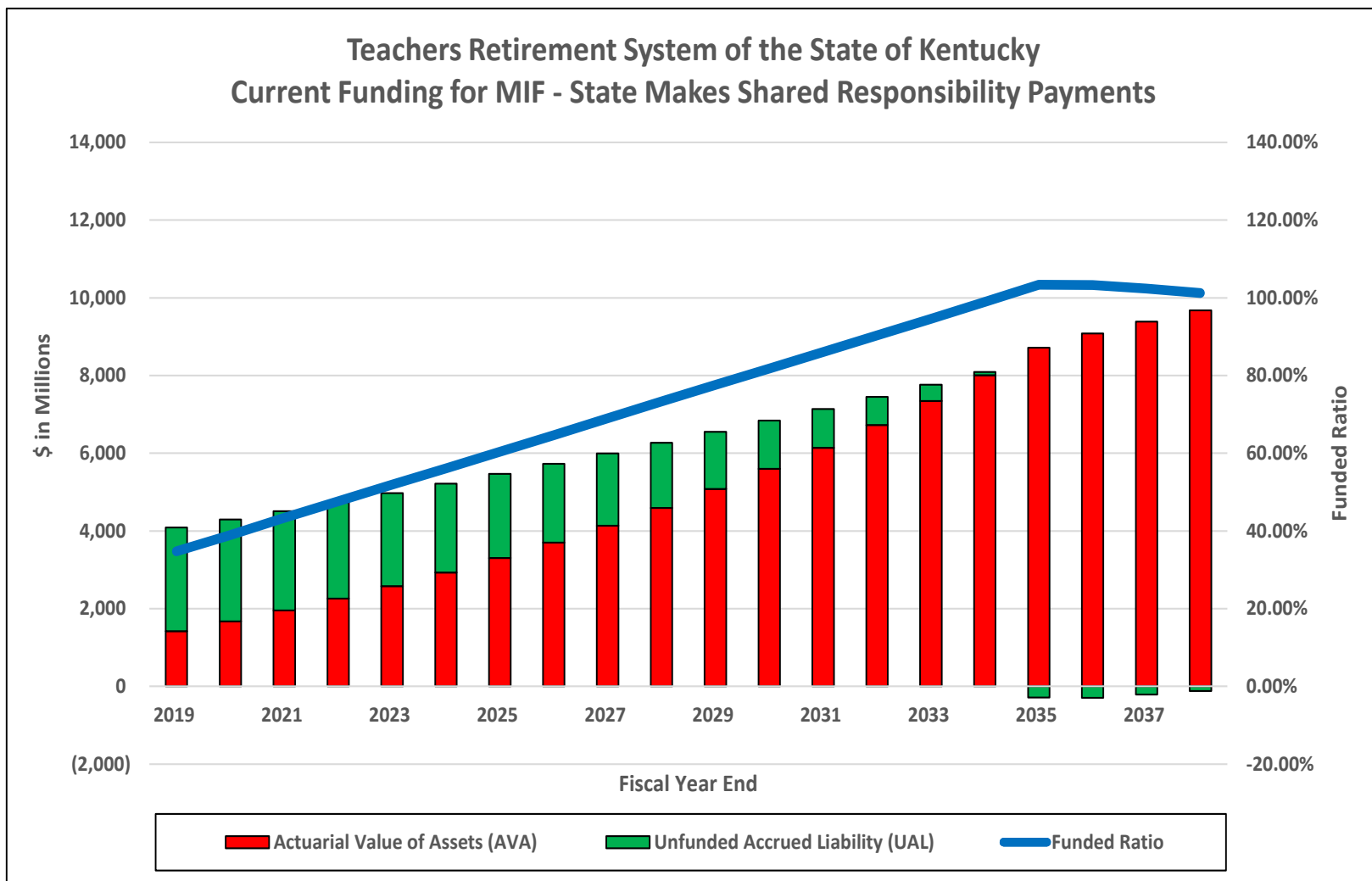


# ***Medical Insurance Fund Shared Responsibility***

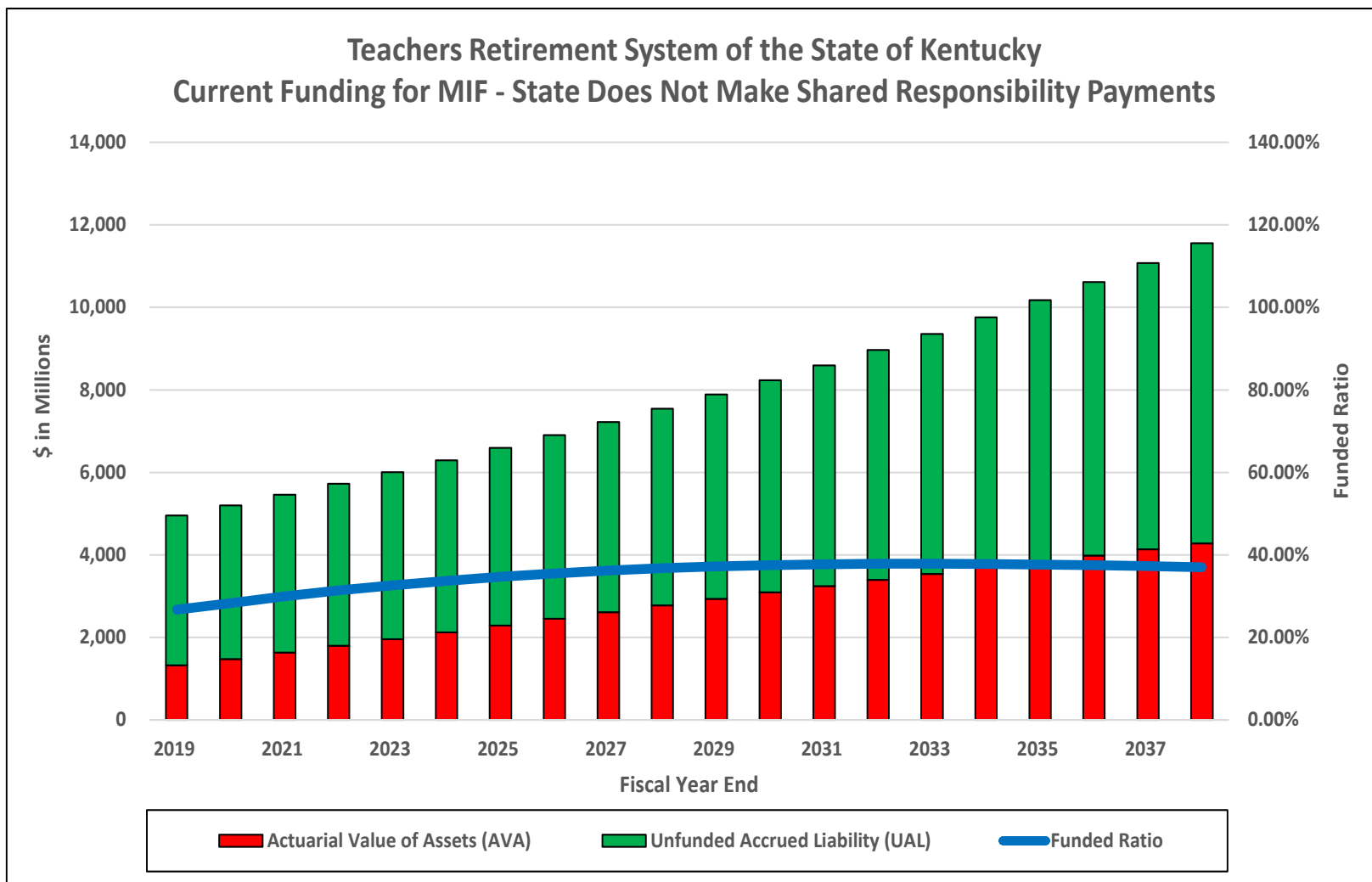


- Graphs on following slides show the projected funded status and unfunded actuarial accrued liabilities with and without the State shared responsibility contributions for members under age 65 who retire on or after July 1, 2010.
- Projections based on June 30, 2017 valuation.
- Assumed investment rate of return is 8.00% with State shared responsibility contributions and 6.50% without State shared responsibility contributions.

# Projected Unfunded Accrued Liability and Funded Ratio With State Shared Responsibility Payments *Medical Insurance Fund*



# Projected Unfunded Accrued Liability and Funded Ratio Without State Shared Responsibility Payments *Medical Insurance Fund*





# Actuarial Valuation Assumptions and Methods

# Unfunded Actuarial Liability

- Unfunded actuarial liability (UAL) = Actuarial Liability less Actuarial Assets
- The existence of an UAL does not automatically mean the system is “underfunded”
- Long term debt
  - Key question is affordability of payments to eliminate it
- Must be financed in addition to the ongoing cost for actives (normal cost) in order to reach fully funded status

# Potential Causes of UAL

- Granting initial benefits or granting benefit increases for service already rendered
- Actual experience which is less favorable than assumed:
  - Higher salary increases
  - Earlier retirement age
  - Lower death rates (people living longer)
  - Lower rates of investment earnings
  - Lower rates of non-death terminations
- Contributing less than the full actuarial contribution rate
- Changes in actuarial assumptions or methods

# Amortization of UAL

- Amortization of UAL has become a major component of actuarial contribution rate in recent years
- Amortization policy decisions
  - One base or multiple bases
  - Amortization period open or closed
  - Length of amortization period
  - Payment is level dollar or level percent of pay

# Amortization Policy

- Amortization Payment Methodology
  - Level dollar
    - Like home mortgage with constant dollar amount of payment
    - Each payment covers interest on UAL and payment on principal
    - More conservative as it pays down the UAL faster
  - Level percent of pay
    - Lower initial payment but increases each year
    - More consistent with budgeting of costs based on payroll
    - Payment may be less than interest on UAL (negative amortization)
- May be influenced by other factors such as the length of the amortization period

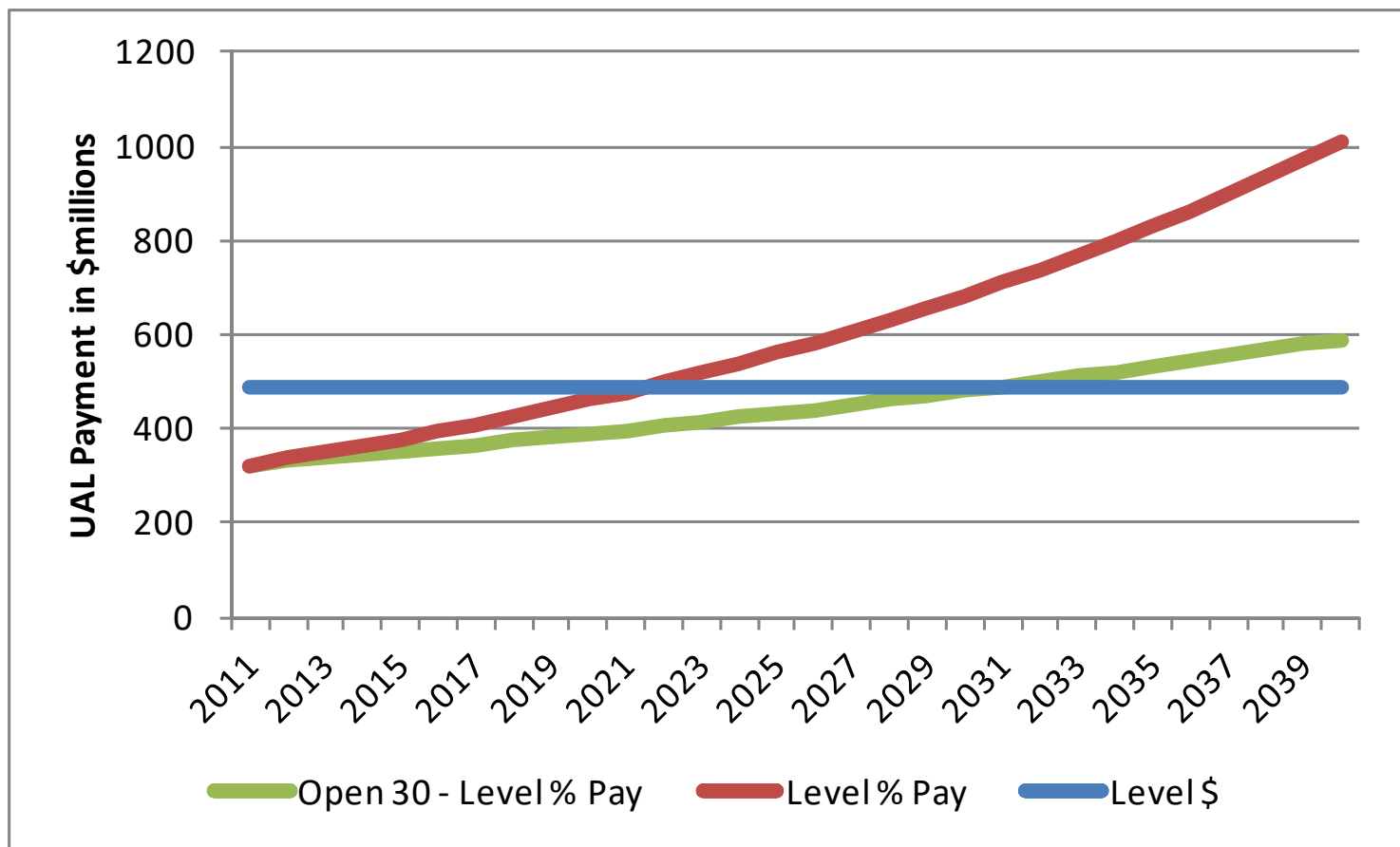
# Amortization of UAL

- Level percent of Payroll Amortization
  - Calculates a rate as a percentage of payroll which is determined to be sufficient to amortize the UAL over a fixed number of years.
  - Rate as a percent of payroll is expected to remain level as overall payroll is expected to increase.
  - Dollar amount of amortization payment increases each year as total payroll increases.
  
- Payroll Growth Assumption
  - Related to, but not the same as, the salary scale assumption.
  - Salary scale assumption is for the individual member while payroll growth assumption is for the overall covered payroll.

# Amortization of UAL

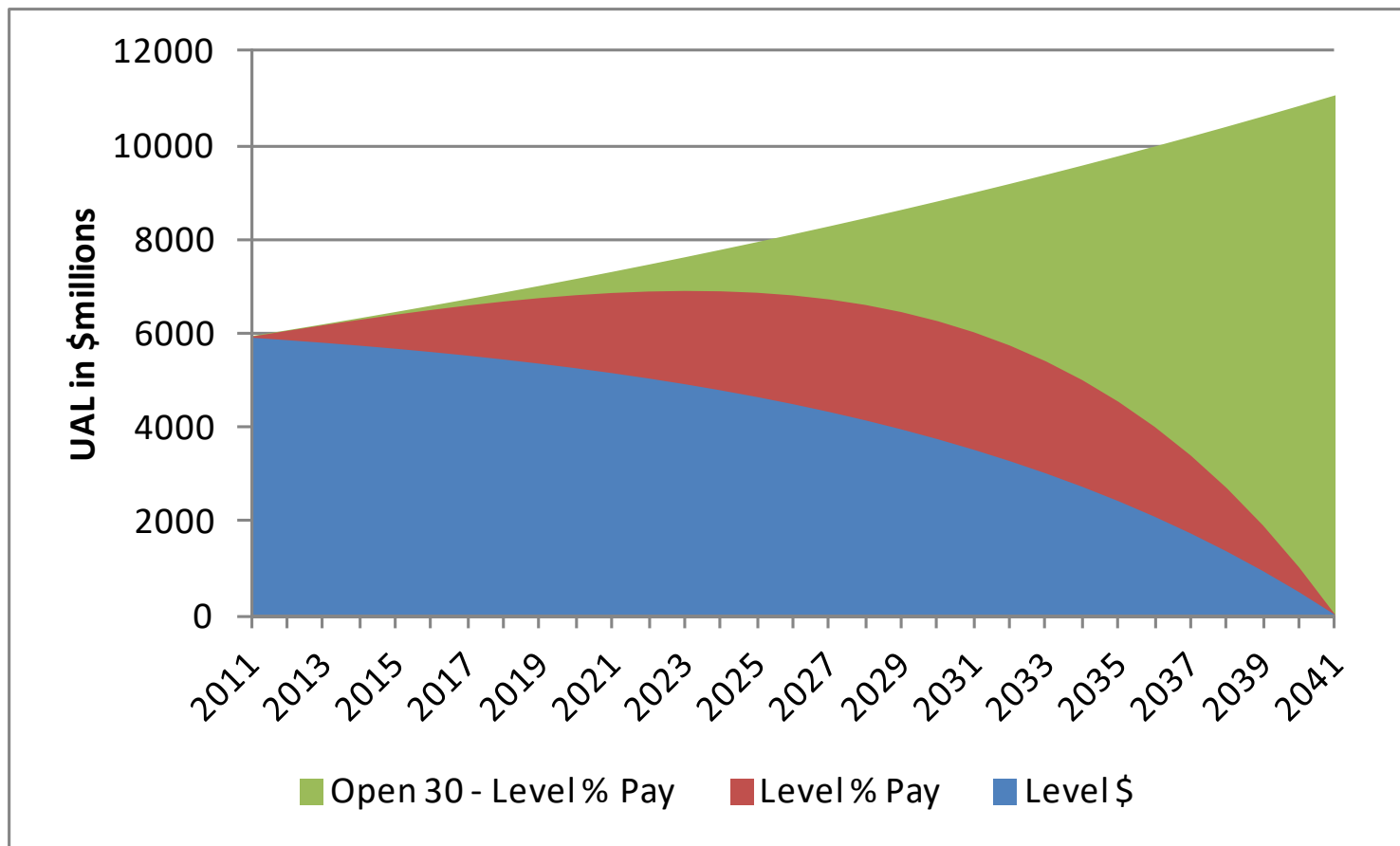
- Payroll Growth Assumption
  - Higher payroll growth assumption produces more backloading – pay less now and pay more later because payroll is expected to grow at a higher rate.
  - Salary scale assumption also at a higher rate, so expected benefits at retirement are higher leading to higher (more conservative) liabilities.
  - Lower payroll growth assumption produces less backloading – pay more now than under higher payroll growth assumption because payroll is expected to grow at a lower rate.
  - Salary scale assumption also at a lower rate, so expected benefits at retirement are lower, leading to lower (less conservative) liabilities.

# Sample of Contributions under Different Amortization Methods





# Sample UAL Balance under Different Amortization Methods



# Economic Assumptions

- Analysis must include:
  - Long term historical information
  - Recent experience
  - Forward looking modeling using current capital market assumptions developed by investment consultant
  - Peer system comparison
  
- Analysis should also include:
  - Recent changes in managers or investment consultant
  - Impact of negative cash flow
  - Investment/Funding Policy
  - Review survey information from other experts

# Economic Assumptions

(from 2015 Experience Study)



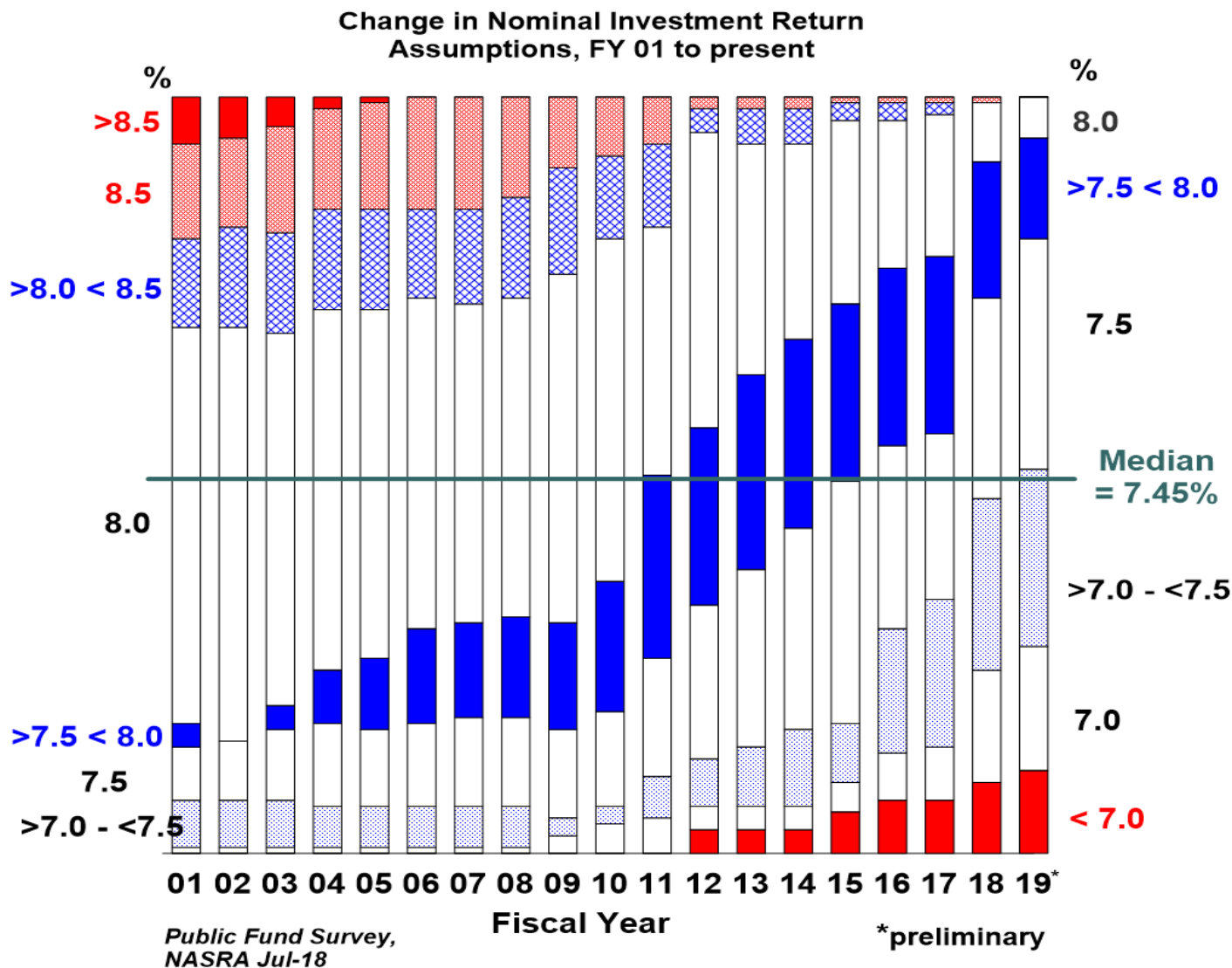
- ASOP No. 27 building block approach
  - Projection results – 50 years
- Investment Return

Item	25 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	75 <sup>th</sup> Percentile
Real Rate of Return	3.34%	4.56%	5.79%
Inflation	3.00%	3.00%	3.00%
Net Investment Return	6.34%	7.56%	8.79%

- Wage Inflation

Wage Inflation Assumption	
Price Inflation	3.00%
Real Wage Growth	0.50%
Wage Inflation	3.50%

# Economic Assumptions



# Actuarial Standards of Practice (ASOP) 51

# ASOP No. 51

## Disclosure of Risk



- **Newest ASOP on Assessment and Disclosure of Risk**
  - Effective for any actuarial work product with a measurement date on or after November 1, 2018.
  - 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.

# ASOP No. 51

## Disclosure of Risk

- Identification of Risks that may affect the plan's future financial condition. Examples (In ASOP)
  - Investment risk – the potential that investment returns will be different than expected
  - Asset/liability mismatch risk
  - Interest rate risk
  - Longevity and other demographic risks – the potential that mortality or other demographic experience will be different than expected
  - Contribution risk
- The second and third are more relevant for corporate plans using bond/duration matching strategies

# ASOP No. 51

## Disclosure of Risk



- Assess risks – does not have to be numerical
- Methods for assessment of risk
  - Scenario testing
  - Sensitivity testing
  - Stochastic modeling
  - Stress testing
  - Comparison to minimal-risk investments
- If other assumptions are used, they must be plausible



# ASOP No. 51

## Disclosure of Risk



- Additional assessment of risk – the actuary can recommend that the intended user have a more complete study performed

# ASOP No. 51

## Disclosure of Risk

- Plan maturity measures – the actuary should calculated and disclose plan maturity measures, in the actuary's professional judgment, are significant to understanding the risks associated with the plan
  - 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
  - Duration of the actuarial accrued liability

# DISCUSSION

# Teachers' Retirement System



## Fiduciary and Ethics Overview

*Presented by*

**Beau Barnes**

Deputy Executive Secretary  
Operations and General Counsel

Nov. 19, 2018

# Overview

Fiduciary training helps fiduciaries understand:

- ♦ Who is a fiduciary?
- ♦ Sources and standards of fiduciary duties
- ♦ Duties under Code of Conduct for Members of a Pension Scheme Governing Body
- ♦ Kentucky Executive Branch Code of Ethics
- ♦ Teachers' Retirement System of the State of Kentucky (TRS) statutes and policies

# What is a Fiduciary?

- ♦ Highest duty in law
- ♦ Undivided loyalty — Trustees must discharge duties solely in interest of plan participants and beneficiaries and for exclusive purpose of providing benefits to them.
- ♦ Trustees should avoid any conflict of interest in which the trustee's interests conflict with interests of plan participants and beneficiaries.

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## Definitions

**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).

# Sources of Fiduciary Duty

Federal  
Law

Common  
Law

State  
Law

Plan and  
Plan-Related  
Documents

Fiduciaries have a duty to administer a plan in good faith in accordance with law and its written plan documents and procedures.

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## **Federal Law**

Internal Revenue Code

## **State Law**

Kentucky Revised Statutes

Kentucky Administrative Regulations

Kentucky Executive Branch Code of Ethics

## **Common Law**

Restatement (Third) of Trusts (Compilation of common law)

Uniform Management of Public Employee Retirement Systems Act  
(UMPERSA) (Not adopted in Kentucky)

## **Plan and Plan-Related Documents**

Trust Documents

Board policies

# Fiduciary Duty In Brief

## General Conduct

1. 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.
2. Avoiding Appearance of Impropriety — “Front Page Test”
3. Due Care — The standard is: “What would a prudent public pension plan trustee do?”



# Fiduciary Duty In Brief

## **Specific Duties Owed to Plan Participants and Beneficiaries**

1. Providing due process.
2. Informing about the plan.
  - Summary plan description, newsletters, website and social media.
3. Protecting the fund.
  - Preventing incursions into fund for political objectives.
  - Requesting actuarially sound contributions to fund.
  - Requiring and collecting contributions when due.
4. Investing solely to provide legal benefits to plan participants and beneficiaries.
  - 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.

# Who is a Fiduciary?

- ♦ The Board of Trustees is administrator and trustee of the TRS trust. (KRS 161.250, 161.430)
- ♦ Executive secretary, investment staff, executive staff
- ♦ Other fiduciaries, depending on circumstances, may include:
  - ♦ Investment counselor (KRS 161.430(2))
  - ♦ Board committees

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## **Board of Trustees Governance Manual**

### **Board Code of Conduct**

**Fiduciary Duty:** Board members are trustees of the retirement system funds and, as such, are subject to strict fiduciary standards of conduct. The board members must act solely in the best interests of the participants and beneficiaries of the system and for the exclusive purposes of providing them with benefits and defraying reasonable administrative expenses. The U.S. Supreme Court has concluded that this duty of loyalty means board members must wear only one hat as a trustee and not, at the same time, wear a second hat as a representative of outside interests. Members are required to discharge their duties with the care, skill, prudence and diligence under the circumstances then that a prudent person acting in a like capacity and familiar with such matters uses in the conduct of an enterprise of a like character and with like aims. See KRS 161.430 and KRS 161.460.

**Conflict of Interest and Confidentiality:** Board members are prohibited by law from engaging in certain party-in-interest transactions (e.g., furnishing of goods or services between the system and a relative of a board member) and are prohibited from using assets of the system for their own interests. Board members are prohibited from receiving any personal consideration from any party dealing with the system in connection with a transaction involving system assets. Board members may not act on behalf of a party whose interests are adverse to the system, its participants or its beneficiaries. Board members are prohibited from having any direct or indirect interest in the gains or profits of any board

investment. Furthermore, board members are prohibited by law from releasing information about TRS or any of its members that would breach any duty to protect such information. See the Conflict of Interest and Confidentiality Policy, (Manual Appendix 7); KRS 161.430; and KRS 161.460.

Kentucky Ethics Laws: Board members are subject to the Kentucky Executive Branch Code of Ethics, KRS Chapter 11A. In addition to adhering to the provisions set forth in the Kentucky ethics laws, board members are prohibited from soliciting or accepting payment of travel expenses, including expenses incurred with the travel for lodging, meals, food and beverages, from anyone other than TRS. Additionally, board members also are prohibited from accepting anything of value from persons or corporations doing business or seeking to do business with the system. See Appendix 4.

### Committees

“The board creates committees to assist the board in effectively fulfilling its fiduciary responsibilities.”

# Who is Not a Fiduciary?

## Settlor

- Establishes, amends, or terminates the plan
- Determines scope of fiduciary duty

## Administrative Entities

- Entities or individuals that solely perform administrative functions:
  - Receives contributions and applies to account,
  - Distribution of educational materials,
  - Implements rules, and/or
  - Processes forms

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- Unless designated as a fiduciary by designation, a settlor (typically the state or legislature) is not a fiduciary
  - The settlor determines the scope of authority of the fiduciary.
  - The fiduciary implements decisions made by the settlor in accordance with fiduciary duties.
- Again, unless otherwise designated, people or entities who perform administrative functions are not fiduciaries
  - Includes administrative staff or third party entities who receive contributions, process forms, provide educational materials, and apply adopted or established rules or guidelines

# Fiduciary Defined: Function or Designation

**Function:** Any person or entity who makes, or has authority to make, discretionary administrative or investment decisions related to retirement plan.

- Trustees
- Anyone who chooses, evaluates or monitors service providers
- Anyone who can bind the plan through contracts

**Designation:** Any person or entity named in a retirement plan or trust document as a fiduciary, *e.g.*, advisory committee, investment committee, investment officers.

Example: Advisory Committee

Example: Investment Committee

Example: Investment Officers

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## Ways to become a fiduciary

- (1) **Designation**: Those who are specifically named in a plan, trust document, statute, or administrative rule as a fiduciary. For example, some statutes will specifically provide that members of certain committees *e.g.* the Advisory Committee, Investment Committee, or certain officers are fiduciaries
- (2) **Function**: Even if not specifically named, a person or entity can become a fiduciary by function.
  - So anyone who has authority to make discretionary administrative or investment decisions related to the plan is a fiduciary
    - Trustees
    - Anyone who chooses, evaluates or monitors service providers
  - Don't have actually exercise authority – just have the authority
  - Anyone who can bind the plan through contracts

# Trustees as Fiduciaries

- ♦ “The general administration and management of the retirement system, and the responsibility for its proper operation ... are vested in a board of trustees to be known as the ‘Board of Trustees of the Teachers’ Retirement System of the State of Kentucky.’ ” (KRS 161.250(1)(a))
- ♦ “The board of trustees shall be the trustee of the funds of the retirement system and shall have full power and responsibility for the purchase, sale, exchange, transfer, or other disposition of the investments and moneys of the retirement system.” (KRS 161.430(1))
- ♦ “The board members and investment counselor shall discharge their duties with respect to the assets of the system solely in the interests of the active contributing members and annuitants ...” (KRS 161.430(2))
- ♦ Engrained in Board Code of Conduct in Governance Manual

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## Board of Trustees Governance Manual

### Board Code of Conduct

**Fiduciary Duty:** Board members are trustees of the retirement system funds and, as such, are subject to strict fiduciary standards of conduct. The board members must act solely in the best interests of the participants and beneficiaries of the system and for the exclusive purposes of providing them with benefits and defraying reasonable administrative expenses. The U.S. Supreme Court has concluded that this duty of loyalty means board members must wear only one hat as a trustee and not, at the same time, wear a second hat as a representative of outside interests. Members are required to discharge their duties with the care, skill, prudence and diligence under the circumstances then that a prudent person acting in a like capacity and familiar with such matters uses in the conduct of an enterprise of a like character and with like aims. See KRS 161.430 and KRS 161.460.

**Conflict of Interest and Confidentiality:** Board members are prohibited by law from engaging in certain party-in-interest transactions (e.g., furnishing of goods or services between the system and a relative of a board member) and are prohibited from using assets of the system for their own interests. Board members are prohibited from receiving any personal consideration from any party dealing with the system in connection with a transaction involving system assets. Board members may not act on behalf of a party whose interests are adverse to the system, its participants or its beneficiaries. Board members are prohibited from having any direct or indirect interest in the gains or profits of any board

investment. Furthermore, board members are prohibited by law from releasing information about TRS or any of its members that would breach any duty to protect such information. See the Conflict of Interest and Confidentiality Policy, (Manual Appendix 7); KRS 161.430; and KRS 161.460.

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# **Fiduciary Duties**

**Duty of Loyalty**

**Duty of Prudence**

**Duty of Care**



# Duty of Loyalty

- ◆ Internal Revenue Code's **Exclusive Benefit Rule**
- ◆ This is a qualification requirement under the Internal Revenue Code.
- ◆ State law
- ◆ TRS' Conflict of Interest and Confidentiality Policy

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## **Internal Revenue Code § 401(a)(2)**

"Under the trust instrument it [must be] impossible, at any time prior to the satisfaction of all liabilities with respect to employees and their beneficiaries under the trust, for any part of the corpus or income to be (within the taxable year or thereafter) used for, or diverted to, purposes other than for the *exclusive benefit of his employees or their beneficiaries*."

## **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."

## **KRS 161.430(2)**

Incorporates **duty of loyalty**:

The board members and investment counselor shall discharge their duties with respect to the assets of the system solely in the interests of the active contributing members and annuitants and:

- (1) For the exclusive purpose of providing benefits to members and annuitants and defraying reasonable expenses of administering the system;

# Duty of Loyalty: Practical Impact

- ♦ A fiduciary has a duty to act in the interest of the trust as if it had no other competing interests to protect.
  - ♦ Cannot act for fiduciary's own interest.
  - ♦ Cannot be influenced by the interest of any third person or outside party.
  - ♦ Must set aside the interests of the party that establishes the fiduciary.
- ♦ Requires undivided loyalty to members and beneficiaries.

# Duty of Prudence

- ♦ “The board members and investment counselor shall discharge their duties with respect to the assets of the system ... : (b) With the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims; ... .” (KRS 161.430(2))

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## **KRS 161.430(2)**

“The board members and investment counselor shall discharge their duties with respect to the assets of the system ...: (b) With the care, skill, **prudence**, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims ... .”

# Duty of Prudence

- ◆ Board Governance Manual
- ◆ Common law of trusts recognizes a continuing responsibility to monitor investments after initial selection
- ◆ In addition to the standards of conduct found in Kentucky state law, TRS trustees “shall adhere to ... the Code of Conduct for Members of a Pension Scheme Governing Body if the individual is a board member.” (KRS 161.430(1))
  - ◆ Code is promulgated by the CFA Institute.

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## Board Governance Manual

### Board Member Roles and Responsibilities

Basic Responsibilities of the Board: The board will undertake its oversight role with an emphasis on: outward vision rather than an internal preoccupation; encouragement of diversity in viewpoints; strategic leadership more than administrative detail; clear distinction of board and staff roles; collective rather than individual decisions; the future rather than past or present; and acting proactively rather than reactively.

The board will:

Cultivate a sense of group responsibility.

Direct, control and inspire the organization through the careful establishment of broad written policies reflecting the board's values and perspectives.

Have its major policy focus on the intended long-term impacts outside the organization, not on the administrative or programmatic means of attaining those effects.

Enforce upon itself matters such as attendance, preparation for meetings, policymaking principles, respect of roles and ensuring the continuance of governance capability.

Include, as part of continual board development, orientation of new board members in the board's governance process and periodic board discussion of process improvement.

Determine how TRS's mission is implemented. It is the board's responsibility to create and review a statement of mission that articulates TRS goals and means.

Contract for the services of an executive secretary to act as the chief executive officer for

the board.

Provide proper financial oversight. The board approves the annual budget and ensures that proper financial controls are in place.

Ensure legal and ethical integrity, adhere to fiduciary duties and maintain accountability. The board ultimately is responsible for ensuring adherence to legal standards and ethical norms.

Ensure effective organizational planning. The board will be involved in strategic planning and assist in monitoring system goals.

Support the executive secretary and assess his/her performance. The board should ensure that the executive secretary has the support he or she needs to further the system's mission.

#### Responsibilities of Individual Board Members.

Board members should:

Be informed about TRS's mission and policies.

Attend board and committee meetings.

Review agendas and supporting materials prior to board and committee meetings.

Serve on committees and offer to accept special assignments.

Keep up to date on developments in the pension and public fund arena.

Follow conflict of interest, disclosure and confidentiality policies.

Assist the board in carrying out its fiduciary responsibilities.

At all times meet high ethical standards to avoid even the appearance of impropriety.

#### **About the CFA Institute Code of Conduct for Members of a Pension Scheme Governing Body**

The Code outlines 10 fundamental ethical principles, which are universally applicable regardless of fund type, for pension fund trustees:

1. Act in good faith and in the best interests of the scheme participants and beneficiaries
2. Act with prudence and reasonable care
3. Act with skill, competence, and diligence
4. Maintain independence and objectivity by, among other actions, avoiding conflicts of interest, refraining from self-dealing, and refusing any gift that could reasonably be expected to affect their loyalty
5. Abide by all applicable laws, rules, and regulations, including the terms of the scheme documents
6. Deal fairly, objectively, and impartially with all participants and beneficiaries
7. Take actions that are consistent with the established mission of the scheme and the policies that support that mission
8. Review on a regular basis the efficiency and effectiveness of the scheme's success in meeting its goals, including assessing the performance and actions of scheme service providers, such as investment managers, consultants and actuaries
9. Maintain confidentiality of scheme, participant, and beneficiary information
10. Communicate with participants, beneficiaries, and supervisory authorities in a timely, accurate, and transparent manner.

# Duty of Prudence: Diversification

- ◆ In investing and managing assets of a retirement system, a fiduciary with authority to invest and manage assets shall diversify the investments unless the trustee reasonably determines that it is not prudent to do so.
- ◆ “The board members and investment counselor shall discharge their duties with respect to the assets of the system...: (c) By diversifying the investments of the plan so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so; ...” KRS § 161.430(2)(c).
- ◆ Fundamental to the prudent management of risk.
- ◆ Consider board’s Investment Policy
  - ◆ 102 KAR 1:175 and 102 KAR 1:178

# Duty of Care: Skill and Diligence

- ◆ According to the Code of Conduct for Members of a Pension Scheme Governing Body:  
“Skill and diligence require trustees to be knowledgeable about the matters and duties with which they have been entrusted.”
- ◆ Trustees may seek appropriate expert or professional guidance if they believe themselves lacking the expertise to make an informed decision.
- ◆ Under KRS 161.430(1), TRS’ board shall employ experienced investment counselors to advise it on all matters pertaining to investments.
- ◆ Since 2009, the TRS Investment Committee has included two experts who have significant investment experience.
- ◆ Since 2017, two gubernatorially appointed investment professionals have served on the board and committee.

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## **Code of Conduct for Members of a Pension Scheme Governing Body**

"Skill and diligence require trustees to be knowledgeable about the matters and duties with which they have been entrusted. Ignorance of a situation or an improper course of action on matters for which the trustee is responsible or should at least be aware is a violation of this code. Improper or ill-advised decisions can be costly to the pension scheme and detrimental to the scheme's participants and beneficiaries. Prior to taking action on behalf of the scheme, effective trustees and/or their designees analyze the potential investment opportunities and act only after undertaking due diligence to ensure they have sufficient knowledge about specific investments or strategies."



# Duty of Care: Skill and Diligence

- “The board generally delegates investment authority for the retirement system to the Investment Committee. The statutory authority for the Investment Committee is KRS 161.430. The purpose of the Investment Committee (committee) is to assist the board with its duty to invest the assets of the retirement system.”
  - Strategy for Implementation of Investment Policies Established by Administrative Regulations, Section 10 Investment Committee Charter.
- “Except as provided by KRS 161.430(7), the board shall contract for actuarial, auditing, legal, medical, investment counseling, and other professional or technical services...”
  - KRS 161.340(3)(a).

## Executive Branch



Statement of Public Policy  
Prohibited Conflicts of Interest  
When to Abstain  
Prohibited Acts  
Acceptance of Gifts  
Statements of Financial Disclosure

# 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.

(KRS 11A.050)



# Prohibited Conflicts of Interest

**No public servant, by himself or through others, shall knowingly use or attempt to use his influence:**

- In any matter that involves a substantial conflict between a personal/private interest and duties in public interest;
- To obtain financial gain
- To secure or create privileges, exemptions, advantages or treatment for himself or others in derogation of the public interest at large.

(KRS 11A.020)

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**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*

# When to Abstain

## Some guidelines for determining whether to abstain:

- Does a personal interest creates a substantial threat to independence of judgment;
- Is participation likely to have any significant effect on the disposition;
- Will the decision affect the public servant differently from the public or differently from others in similar positions (i.e., jobs)
- A public servant may request an advisory opinion from the Executive Branch Ethics Commission in accordance with the Commission's rules of procedure.

(KRS 11A.030)

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## **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

## Examples:

- Knowingly disclosing or using confidential information gained in duties.
- Knowingly undertaking, bidding on, negotiating, or enjoying any agreement or purchase made or awarded by the agency where the public servant is employed or supervises for himself or a business where he owns at least 5 percent.
- Knowingly accepting compensation, other than that provided by law, for performance of official duties without the prior commission approval.
- Violating employment restrictions.
- Lobbying and representation restrictions for one year.

(KRS 11A.040)

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## **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*



# Acceptance of Gifts

**Generally, the Board Governance Manual says gifts should be avoided.**

**The Executive Branch Code provides:**

“No public servant ... shall accept any gifts ... totaling more than \$25 in a calendar year from any person or business that does business with ... the agency in which the public servant is employed or which he or she supervises ... .”

Not included: Gifts from family, campaign donations or prizes available to the public.  
(KRS 11A.010(5))

**BUT: Even if otherwise allowed, gifts are a problem if made quid pro quo.**  
(KRS 11A.045)

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**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*

# 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.

(KRS 11A.050)



# TRS Conflict of Interest Statute

## **No trustee or employee of the board shall:**

1. Have any interest, direct or indirect, in the gain or profits of any investment or transaction made by the board;
2. Use any TRS assets except to make 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 with TRS individually or through a business;
5. Use his or her official position with TRS to obtain a financial benefit;
6. Use confidential TRS information to further personal economic interests; or
7. Generally, hold outside employment with any person or business that he or she has involvement as part of TRS position.

(KRS 161.460)

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Trustees, staff and managers sign statements of adherence to the law and policies.

## **No trustee or employee of the board 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;

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###### 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 is directly or indirectly financially impacted by a decision made by TRS in which the individual has a financial interest.

3) Individuals and their family members are any agency doing business with TRS for contract, without full disclosure and set of interest in accordance with the Executive Branch Ethics 11A.

4) Individuals should not be involved in the member of their family as defined by the Executive Branch Ethics 11A.

5) Individuals should not conduct business agency in which the individual or family member is employed.

6) Individuals should not accept campaign contributions, services or other compensation, reasonably be inferred that a major part in the performance of their duties for TRS.

7) Individuals must avoid all conduct that that the individual is using his or her political or private interest.

8) Individuals not covered by the conflict must not violate any conflict of interest their duties with TRS. These individuals financial or other transaction with a business of the Executive Branch Ethics 11A.

###### C. Standards of Conduct Regarding Confidentiality

Page 2

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

Page 3 of 3

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 \_\_\_\_\_

# TRS External Service Provider

## *Conflict of Interest Statement*



*Read, sign & return to TRS*

# 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. 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 something does not mean that it is OK.





**Teachers' Retirement System**  
of the State of Kentucky

*Our Members  
Come First!*

---

**800-618-1687**

**502-848-8500**

<https://trs.ky.gov>

*Protecting & Preserving Teachers' Retirement Benefits*



# TRS Investment Plan

## Asset Allocation and Portfolio Diversification

Tom Siderewicz, CFA  
Chief Investment Officer



# Investment Objectives

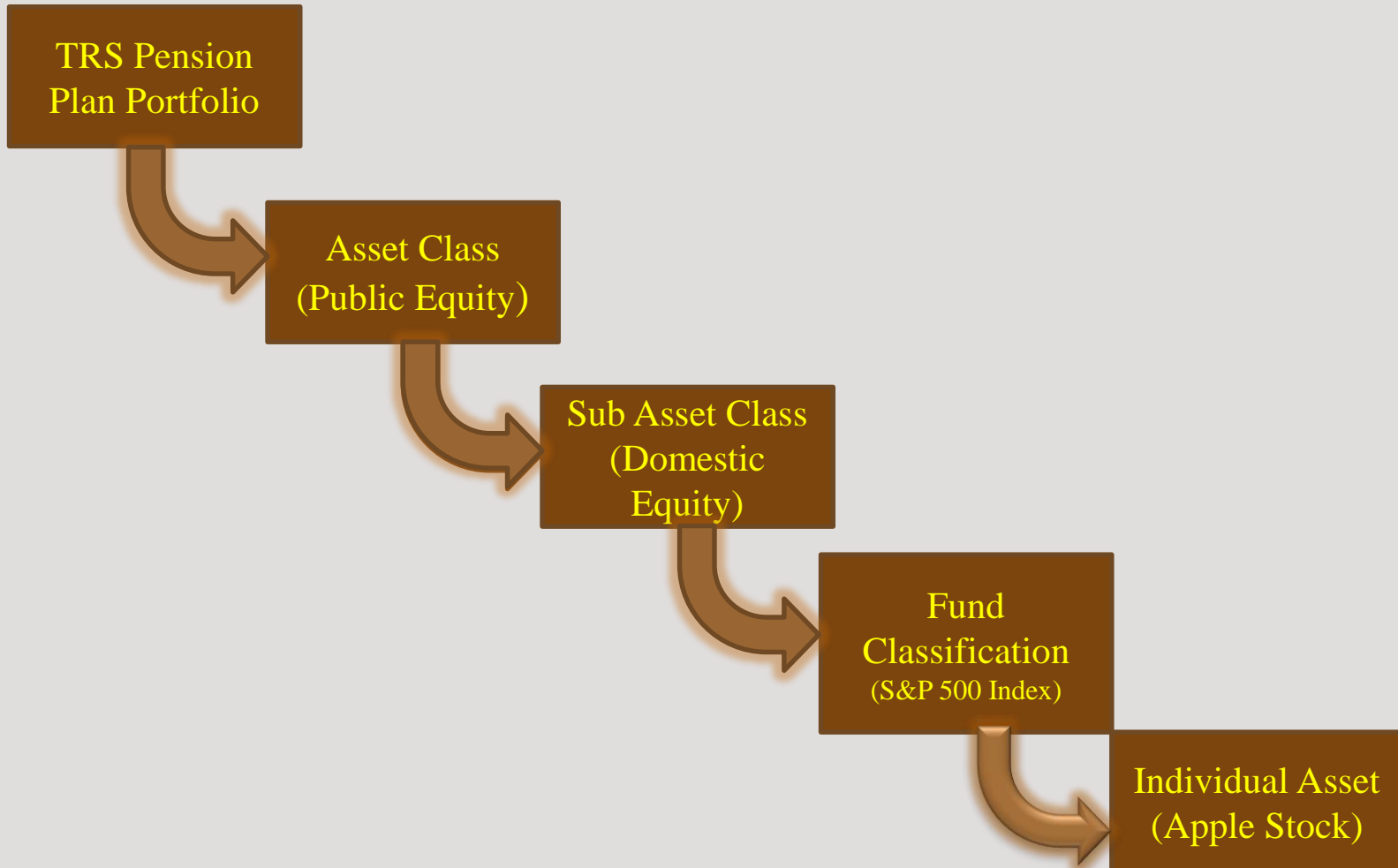
Provide the highest possible long-term rate of return within appropriate risk levels.

Diversify the members' funds in several classes of assets, including equities, bonds, real estate, and alternative investments such as private equity, timberland, and bank loans.

As a long-term investor, TRS holdings can withstand some short-term volatility.

The retirement annuity trust fund's long-term investment objective is to achieve an annualized rate of return of 7.5%.

# Asset Flowchart



# Retirement Annuity Trust

## Asset Allocation

	<u>June 30, 2018</u>	<u>%</u>	<u>June 30, 2017</u>	<u>%</u>
Cash Equivalents	236,645,496	1.2	366,129,983	2.0
Fixed Income	3,036,033,540	15.3	3,020,457,272	16.2
Domestic Equities	8,164,946,090	41.3	7,682,590,280	41.3
International Equities	4,502,791,612	22.7	4,003,953,513	21.5
Real Estate	1,150,694,281	5.8	1,046,760,133	5.6
Private Equity	1,095,289,505	5.5	854,635,618	4.6
Timberland	187,540,819	1.0	208,219,943	1.1
Additional Categories	<u>1,428,742,753</u>	<u>7.2</u>	<u>1,435,143,549</u>	<u>7.7</u>
Totals	19,802,684,099	100.0	18,617,890,295	100.0

# Asset Classes – Theoretical Risk/Return Trade-offs





# Asset Allocation

- On an annual basis, target percentages and ranges for the retirement system's various asset classes are presented to the Investment Committee for approval.
- Annually approved asset allocation parameters serve to balance the retirement system's liquidity requirements, risk tolerance, and return requirements to meet both short-term and long-term obligations.



# Asset Allocation

- Within each broad asset class, the retirement system's investments are diversified across a variety of investment managers, investment management styles, and individual securities in order to reduce volatility and enhance the potential of the investment portfolio to achieve the retirement system's long-term goals.
- Asset allocation decisions for pension plans are highly dependent on the unique characteristics of a particular plan. Factors such as liability requirements, the level of funding, and statutory investment restrictions are important considerations within the context of the asset allocation decision making process. Consequently, asset allocations may differ markedly between various pension plans due to their unique circumstances.



# Strategic Ranges by Asset Class

Asset Class	Regulatory Limits (Mkt Value)	Strategic Range (Mkt)	Target (Mkt)	Sept. 30, 2018 (Mkt)**
Cash		1-3%	2%	1.1%
Fixed Income		12-19%	15%	17.4%
Government/Agency/Other	Unlimited			10.5%
Corporate	35%			6.9%
Equity	65%	57-65%	62%	62.1%
Domestic Large Cap		32-40%	35%	34.1%
Domestic Mid Cap		1-5%	3%	3.4%
Domestic Small Cap		1-3%	2%	2.3%
International	30%	18-25%	22%	22.3%
Real Estate	10%	4-10%	7%	5.8%
Alternative Inv.	10%	4-10%	7%	6.6%
Additional Categories	15%	4-10%	7%	7.0%



# Policy Index

Asset Class	Benchmark	%	=100%
Cash	90 Day T-Bill	2.0	
Fixed Income	Barclays Govt/Credit	15.0	
US Large Cap	S&P 500	35.0	
US Mid Cap	S&P 400	3.0	
US Small Cap	S&P 600	2.0	
International Equities	MSCIAC World (Ex US)	22.0	
Real Estate			
Internally Managed	CPI +2%	2.5	
Core	NCREIF Open-End Commingled Fund Index (NCREIF-ODCE)	2.5	
Value Added, Opportunistic, and Secondary	NREIF	2.0	
Alternative Investments			
< 5yr Private Equity, VC, Infrastructure	Actual Returns	3.5	
> 5yr Private Equity, VC Infrastructure	S&P 500 +3%	2.5	
Timberland	NCREIF Timberland	1.0	
Additional Categories	Merrill Lynch High Yield Index	7.0	

# TRS Asset Allocation – June 30, 2018

	BNY Mellon Peer Median <sup>1</sup>	TRS June 30, 2018	TRS Adjusted June 30, 2018	Target
U.S. Equity	30.7%	41.3%	41.3%	40.0%
International Equity	19.1	22.7	22.7	22.0
U.S. Fixed Income	23.5	15.3	20.4	15.0
International Fixed Income	2.0	0	0	--
Additional Categories	--	7.2	0	8.0
Real Estate	6.1	5.8	5.8	6.0
Alternative Investments	19.3	6.5	8.6	7.0
Cash Equivalents	1.7	1.2	1.2	2.0
Total Fund	--	100.0%	100.0%	100.0%

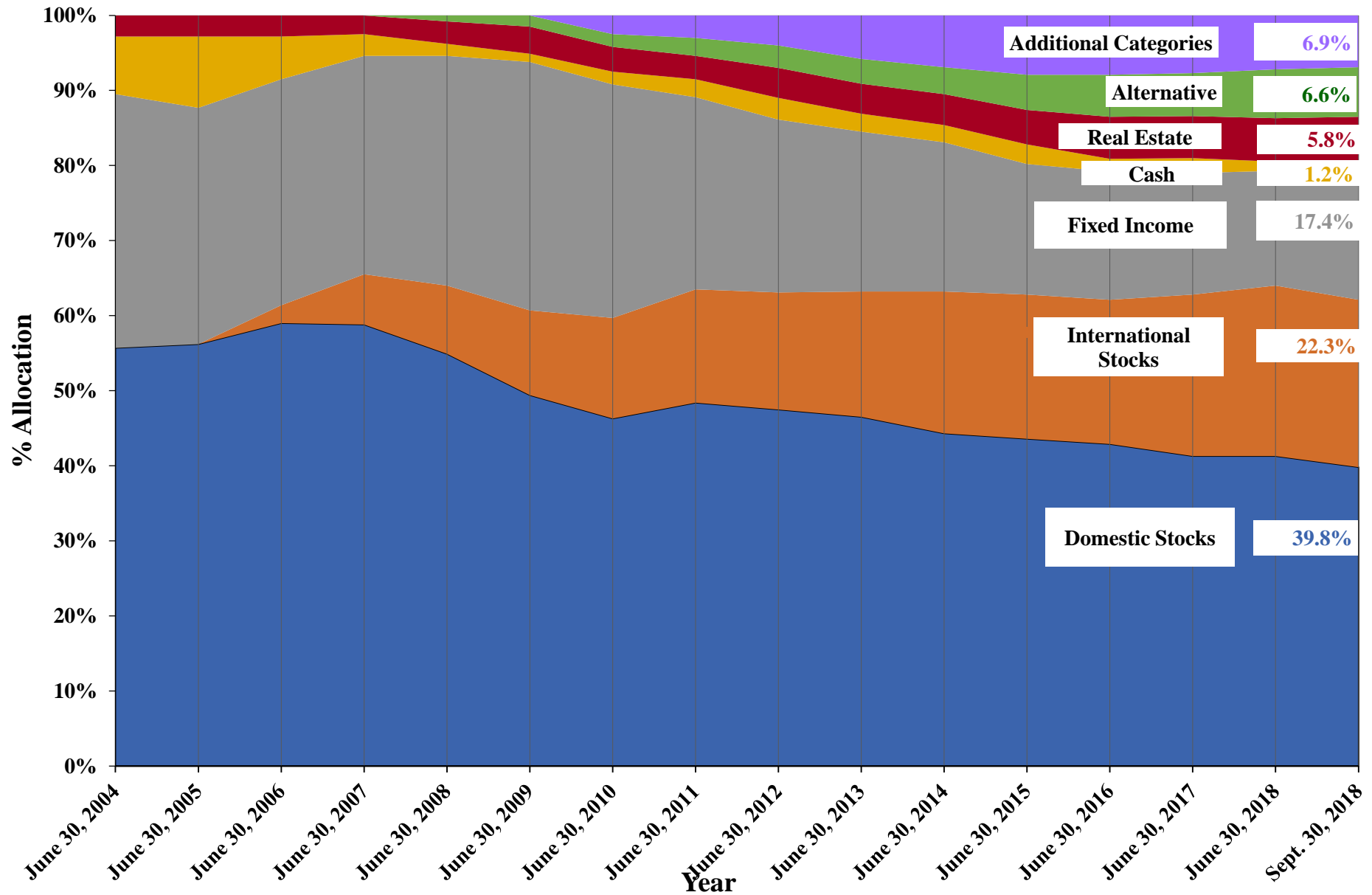
<sup>1</sup> Based on the Total Public Fund >\$1B Universe of 55 public pension funds over \$1 billion compiled by BNY Mellon Performance & Risk Analytics, LLC as of June 30, 2018. Totals will not equal 100.0%.

# TRS Asset Allocation History

[illegible]

# Asset Allocation by Year

■ Domestic Stocks ■ International Stocks ■ Fixed Income ■ Cash ■ Real Estate ■ Alternative ■ Additional Categories



# Equity Rebalancing

## Cash withdrawals from Public Equity 3-31-2009 through 9-30-2018

Beginning Balances 3/31/2009

Domestic Equities	4,944,154,810
International Equities	1,059,116,109
Total Equities	6,003,270,919

Total Net Withdrawal  
since 3-31-09

Dividend Withdrawals  
since 3-31-09

<b>Total Domestic</b>	<b>6,222,692,500</b>	<b>1,199,939,742</b>
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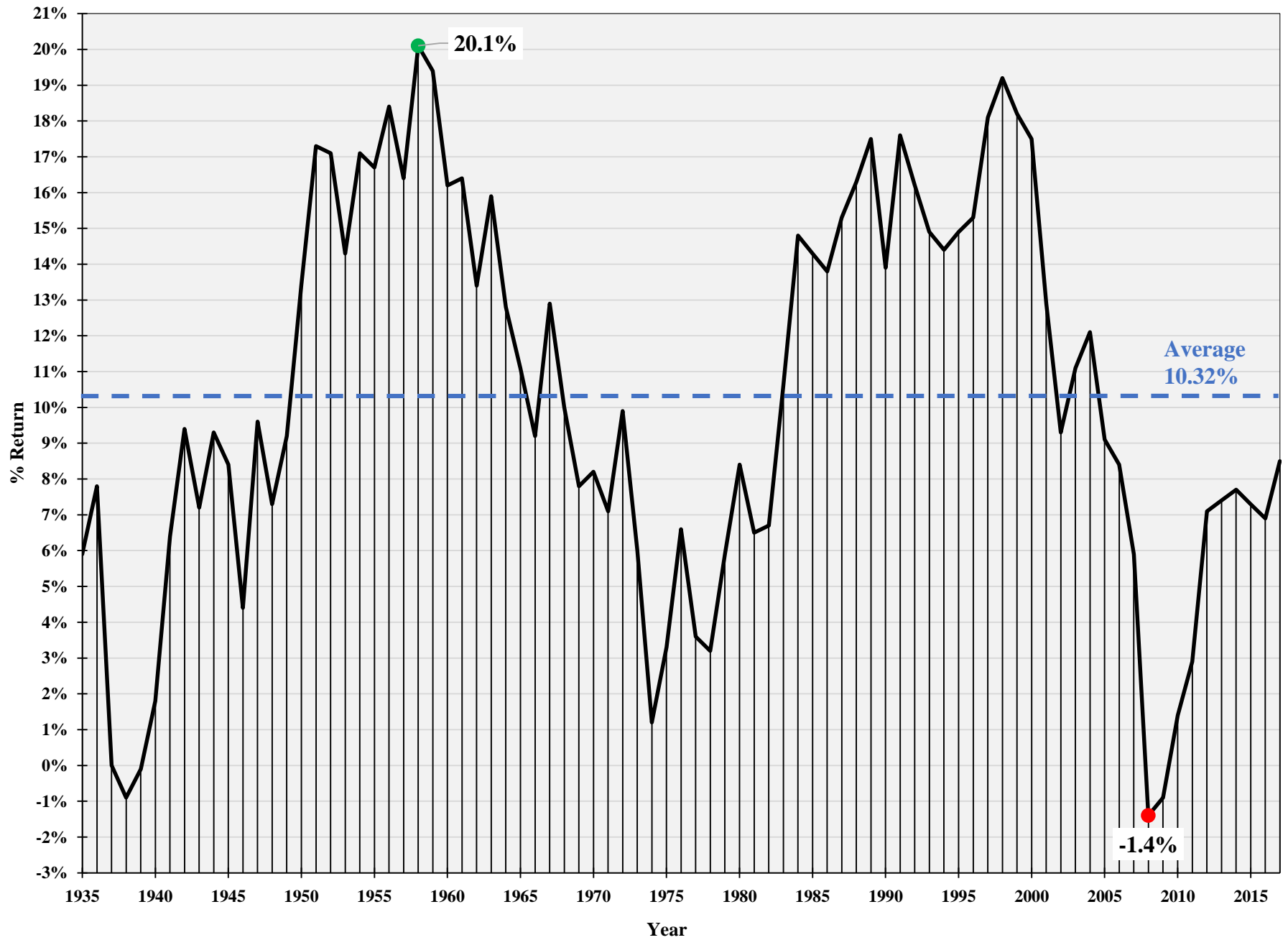
<b>Total International</b>	<b>-1,105,096,100</b>	<b>174,580,957</b>
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<b>Total Equity Withdrawal</b>	<b>5,117,596,400</b>	<b>1,374,520,699</b>
		<b>6,492,117,099</b>

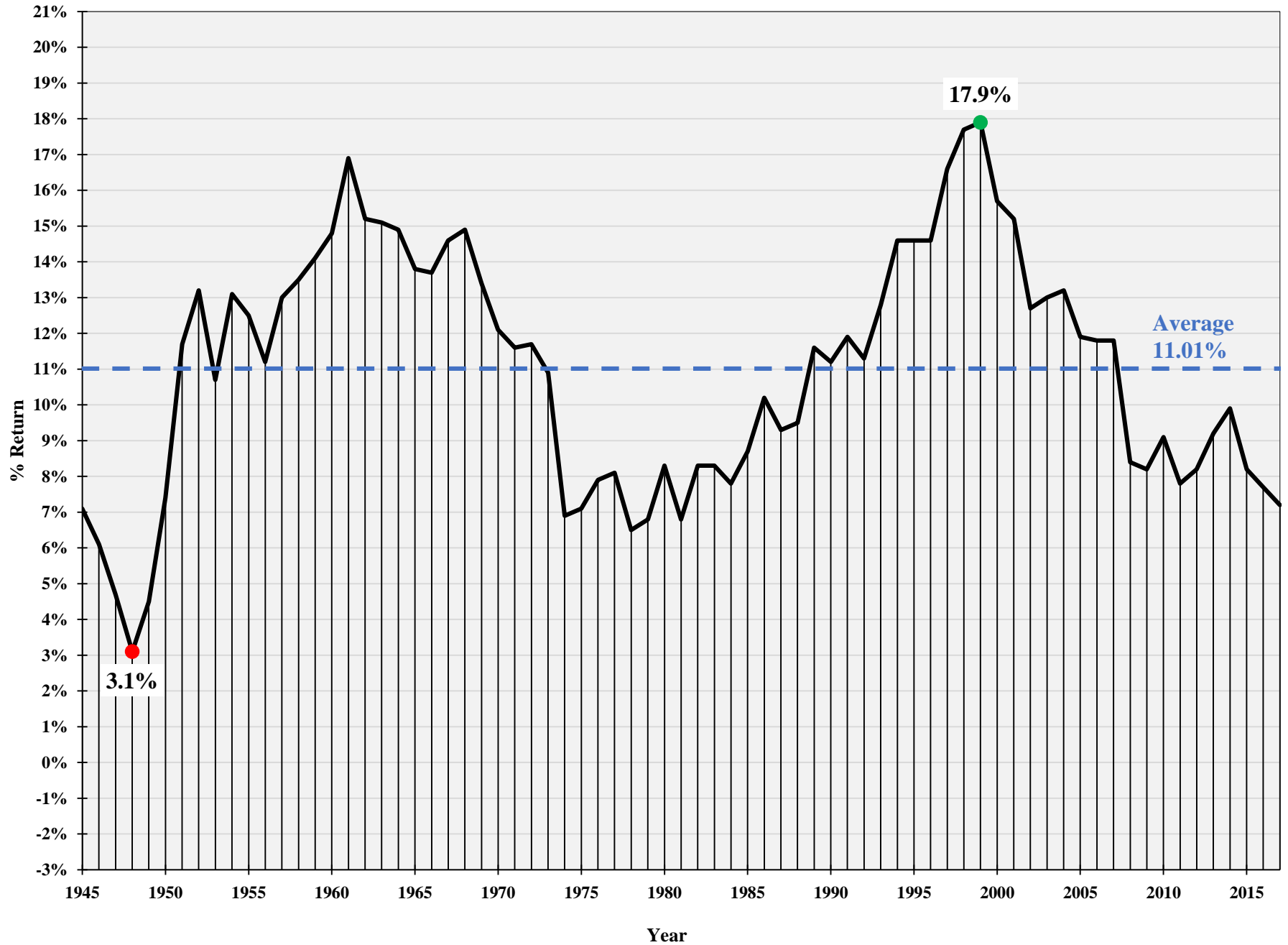
Ending Balance 9/30/2018

Domestic Equities	8,070,384,759
International Equities	4,496,908,581
Total Equities	12,567,293,340

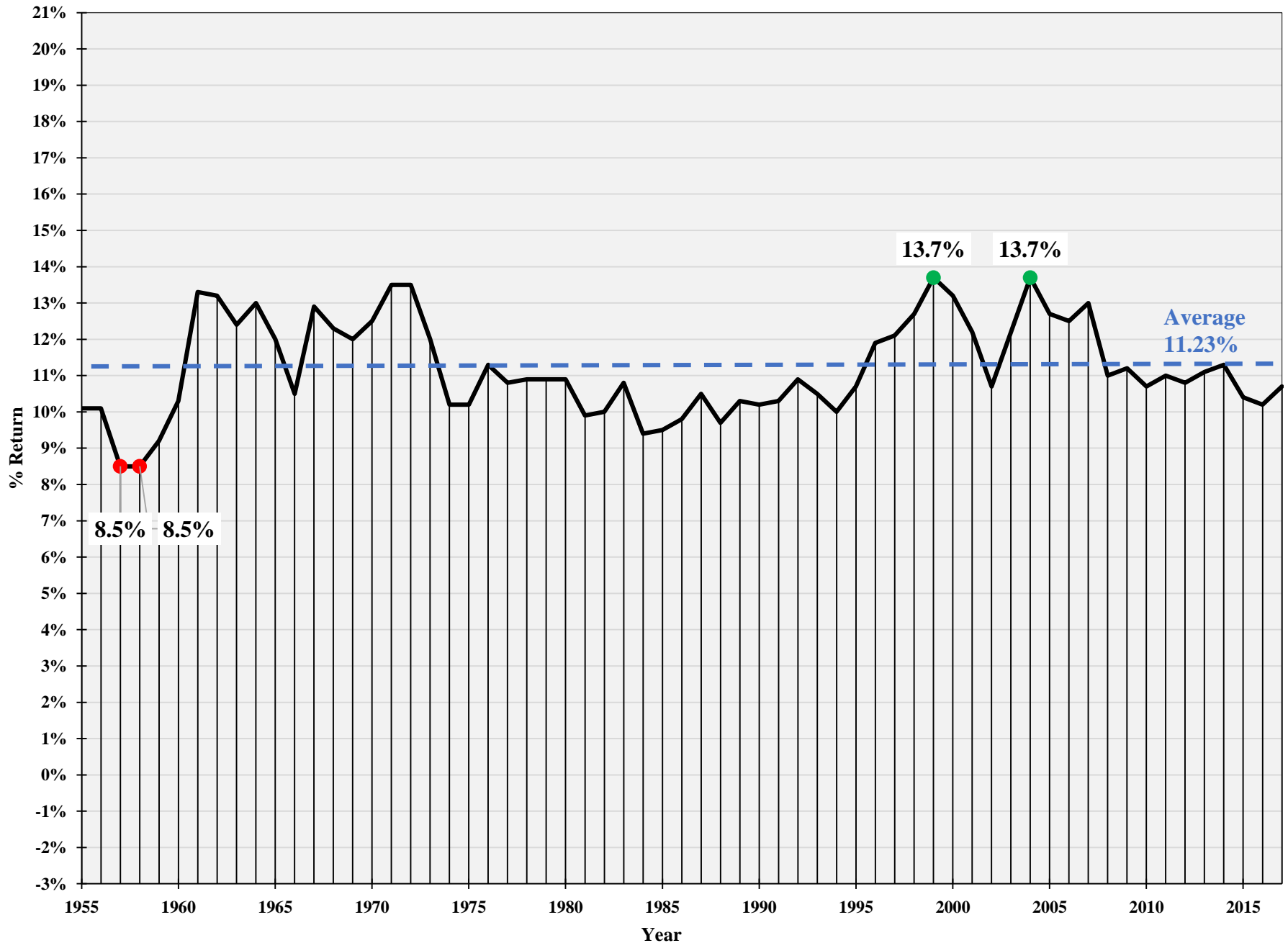
# S&P 500 Rolling 10-Year Returns



# S&P 500 Rolling 20-Year Returns

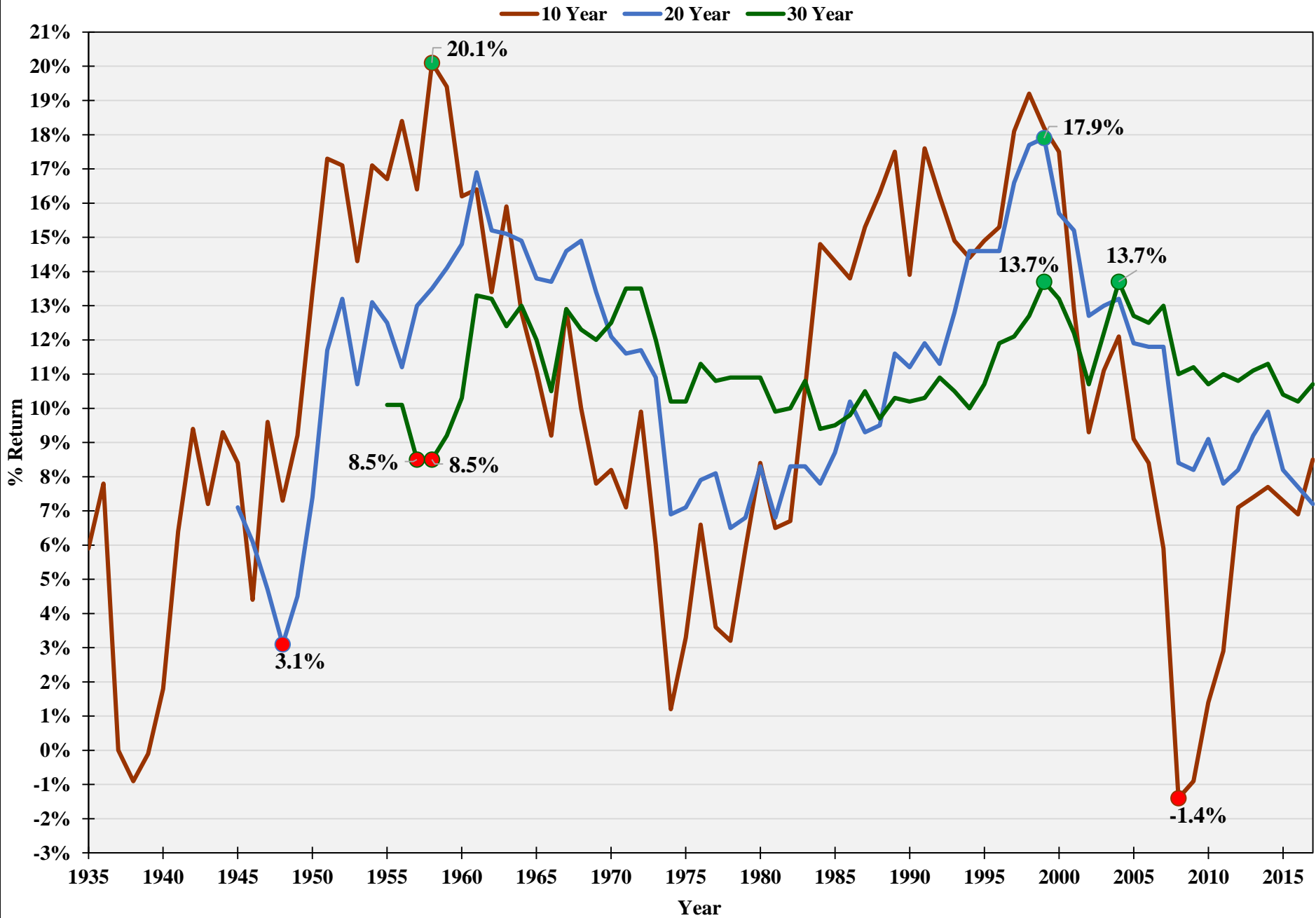


# S&P 500 Rolling 30-Year Returns





# S&P 500 Rolling 10-, 20- and 30-Year Returns



# Euro Currency

EUR ↑ 1.1269 +.0051 BGN 1.1269 / 1.1270 BGN  
At 13:31 Op 1.1218 Hi 1.1294 Lo 1.1217 Close 1.1218 Value 11/15/18

EUR BGN Currency 95) Compare 96) Actions ▾ 97) Edit ▾ Bar Chart

11/30/1998 ▢ - 11/13/2018 ▢ Last Price ▾ BGN USD ▾ Mov Avgs ▾ Key Events ⓘ

1D 3D 1M 6M YTD 1Y 5Y Max Monthly ▾ ⌵ ⌶ Table ⏪ ⏩ Chart Content ⚙

■ Last Price 1.1269  
▤ High on 07/31/08 1.6038  
+ Average 1.2074  
▥ Low on 10/31/00 0.8230



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

Copyright 2018 Bloomberg Finance L.P.  
SN 545029 EST GMT-5:00 6457-4529-1 13-Nov-2018 13:31:32

# Euro Stoxx 50 Returns

SX5E ↓ 3224.82 +30.74  
 At 11:50 d 0 3200.08 H 3228.88 L 3196.70 Prev 3194.08

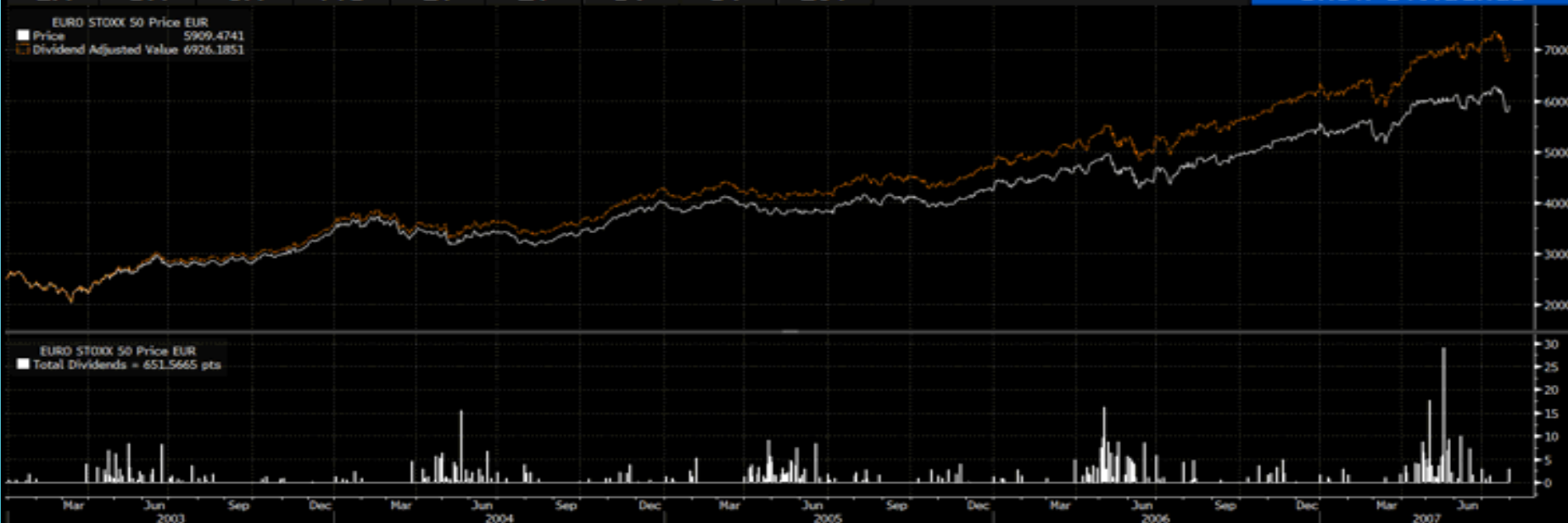
SX5E Index 1) Settings Page 1 Total Return Analysis

Range 12/30/2002 - 07/31/2007 Period Daily Currency USD

Price ● Open ● Close Dividends ● Gross ● Net 1674 Day Holding Period Table

Holding Strategy	Total Return	Annual Eq	Gain/Loss
Price Change	136.3561%	20.6293%	+3.4092k
Divs Reinvested In The Index	177.0206%	24.8779%	+4.4259k
Dividends Reinvested At <span style="background-color: #f0f0f0;">0.0000%</span>	162.4163%	23.4119%	+4.0608k

1M 3M 6M YTD 1Y 2Y 3Y 5Y 10Y Show Dividends



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

Copyright 2018 Bloomberg Finance L.P.  
 SN 545029 EST GMT-5:00 G457-4529-1 13-Nov-2018 13:22:38

# Dow 30 Returns

INDU ↑ 25333.29 -53.89 25327.38 / 25335.85

At 13:26 0 25321.21 H 25511.03 L 25193.78 Prev 25387.18

INDU Index Settings Page 1 Total Return Analysis

Range 12/30/2002 - 07/31/2007 Period Daily Currency USD

Price Open Close Dividends Gross Net 1674 Day Holding Period Table

Holding Strategy Total Return Annual Eq Gain/Loss

Price Change 58.5531% 10.5723% +4.8791k

Divs Reinvested In The Index 75.6598% 13.0703% +6.3046k

Dividends Reinvested At 1.2226% 71.9628% 12.5471% +5.9965k

1M 3M 6M YTD 1Y 2Y 3Y 5Y 10Y Show Dividends



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

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 SN 545029 EST GMT-5:00 6457-4529-1 13-Nov-2018 13:26:26

# 10-Year U.S. Treasury Yield

T 3 1/8 11/15/28

↓ 100-04+ + 04+

100-04 / 100-04+

3.110 / 3.109

At 13:31

-- x --

Source BGN

GT10 Govt

95) Compare

96) Actions ▾

97) Edit ▾

Yield Chart

12/31/1980 ▢ -

11/15/2018 ▢

M Yld Cnv ▾

USD ▾

Mov Avgs ✎

Key Events ⓘ

1D

3D

1M

6M

YTD

1Y

5Y

Max

Monthly ▾

Table

<<

Chart Content

⚙



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

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SN 545029 EST GMT-5:00 H187-5488-1 15-Nov-2018 13:31:20



# BAA Corporate Bonds Spread to U.S. Treasuries

.BAAS S 1.8295 Description BAA spread  
As of 11/14/2018 Owner \*\*\*\*\* DELETE

.BAAS S 50760804 I 95 Compare 96 Actions 97 Edit Line Chart

06/30/2008 - 09/28/2018 Last Price Mov Avgs Key Events

BAA spread MOODCBAA Index - YIELD[...] Last Price

1D 3D 1M 6M YTD 1Y 5Y Max Daily Table Chart Content

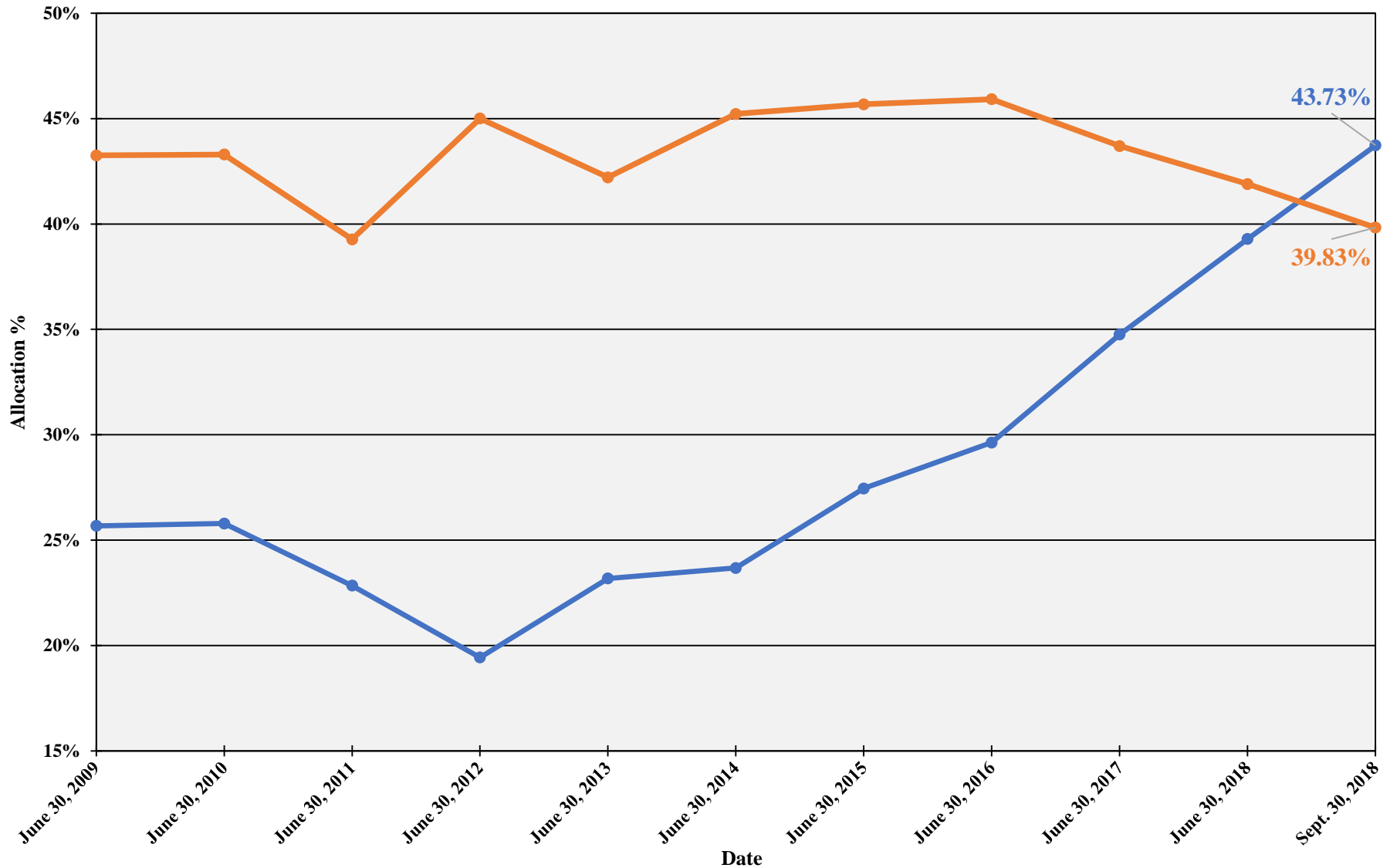


Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

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SN 545029 EST GMT-5:00 H444-2446-1 14-Nov-2018 14:52:44

# Government and Corporate Bonds as a Percentage of Fixed Income

—●— Government Bonds    —●— Corporate Bonds

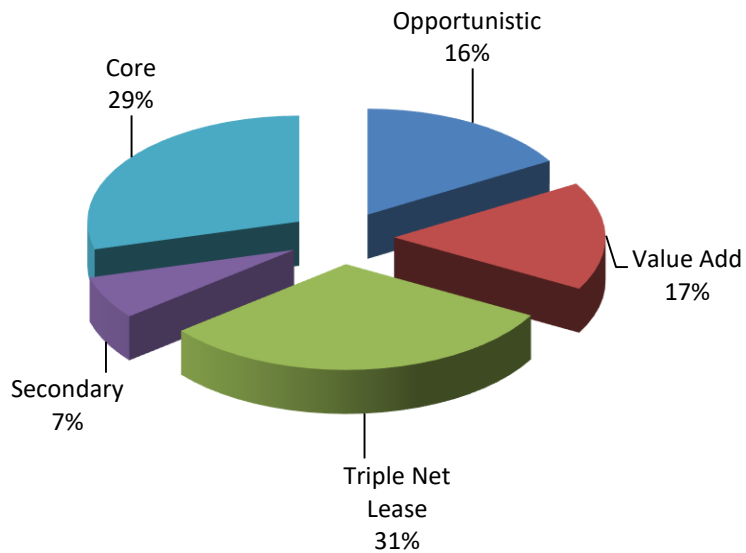


# TRS of Kentucky Pension Real Estate Portfolio

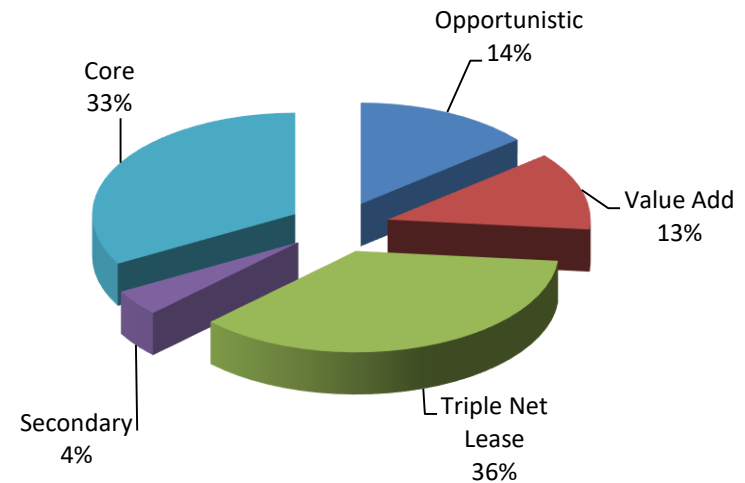
## Committed and Funded

as of September 30, 2018

Committed  
\$1.512 Billion



Funded  
\$1.261 Billion

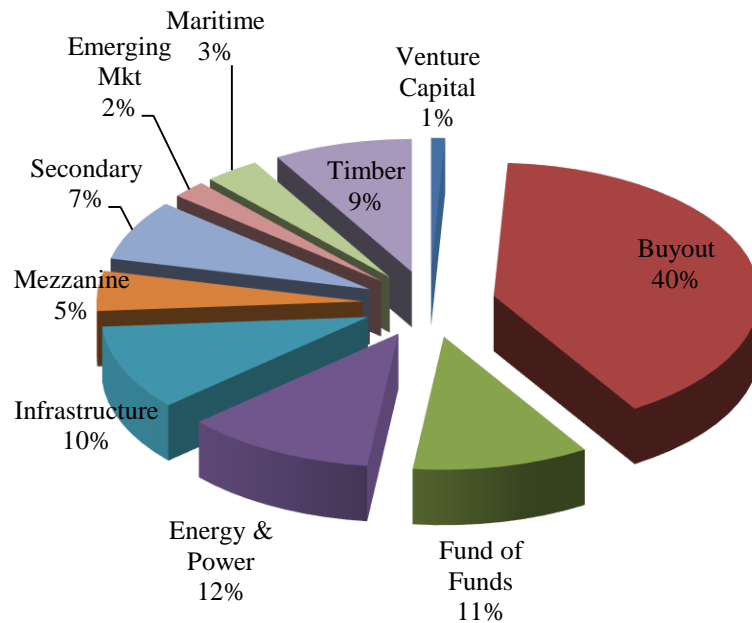




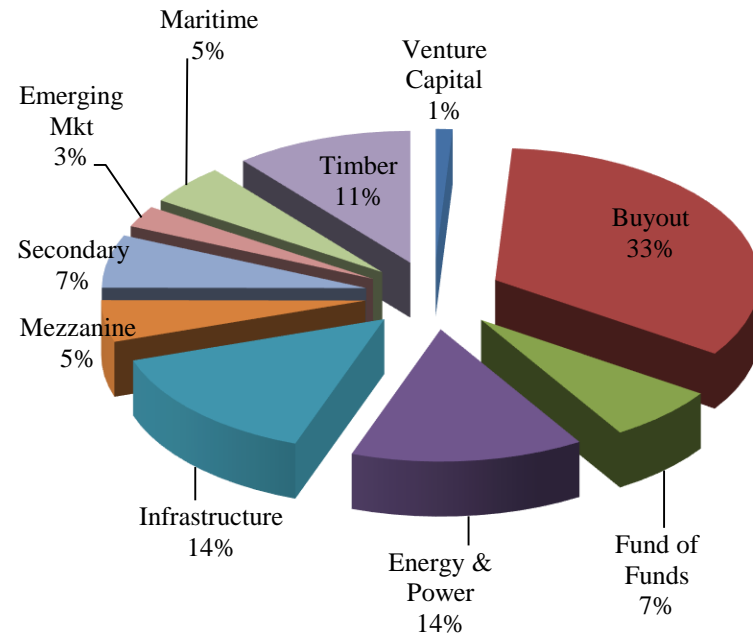
# TRS Kentucky Pension Fund Alternative Portfolio

Committed and Funded as of Sept. 30, 2018

Committed  
\$2.370 Billion

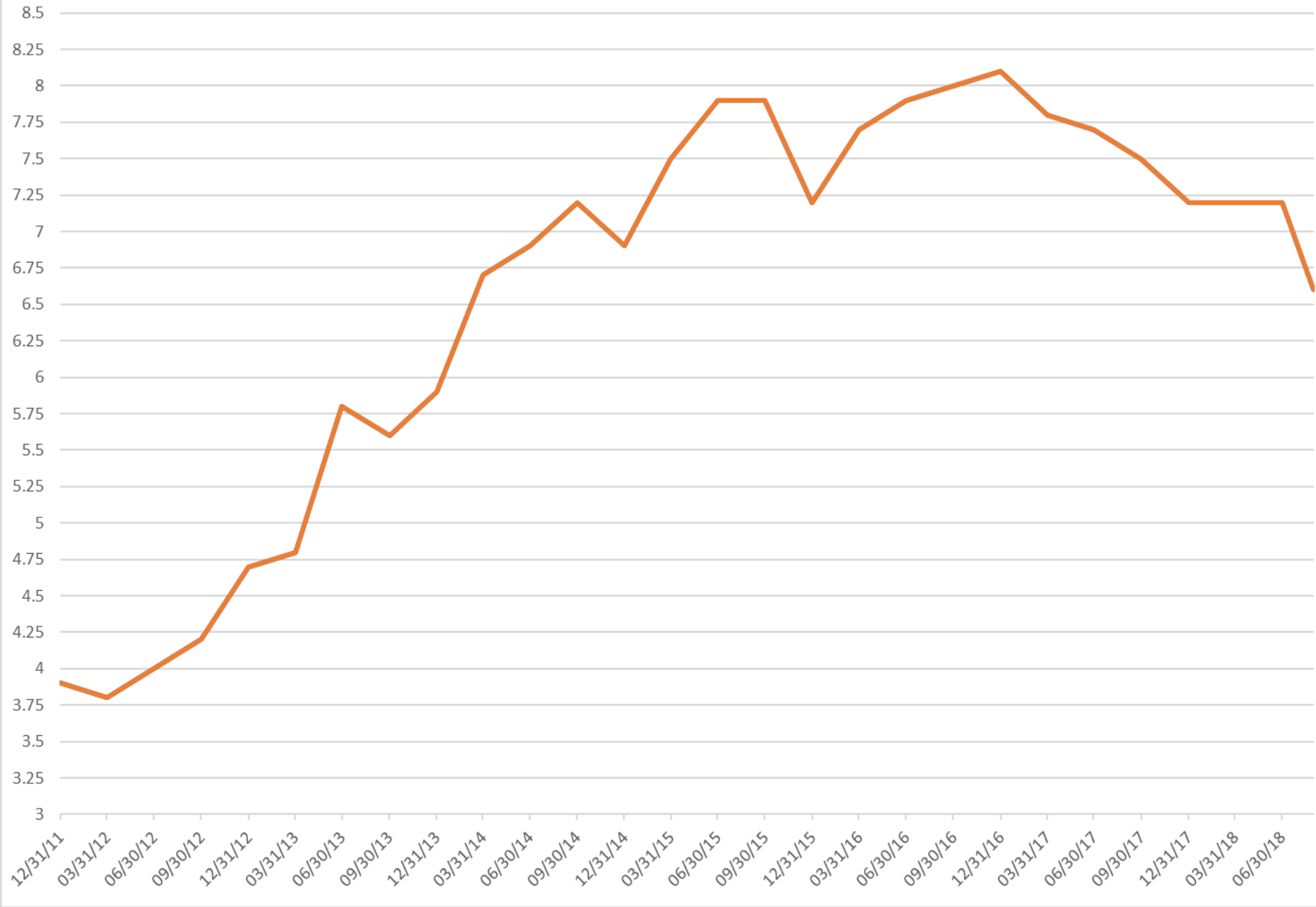


Funded  
\$1.528 Billion



Does not include TRS Kentucky Special Situations or Real Estate portfolios

## Additional Categories (Alternative Credit)



# High Yield Spread

.KDP10YS S 3.4287

As of 11/15/2018

Owner \*\*\*\*\* DELETE

.KDP10YS S 507608 95 Compare 96 Actions 97 Edit

Line Chart

11/15/2011 - 11/15/2018 Last Price Mov Avgs Key Events

KDP10YS KDPBDYLD Index - YIELD[- Last Price

1D 3D 1M 6M YTD 1Y 5Y Max Daily Table Chart Content



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2018 Bloomberg Finance L.P.  
SN 545029 EST GMT-5:00 H187-5488-1 15-Nov-2018 16:37:08

# 2008 Asset Allocation Analysis

Asset Class	TRS Allocation	10 Year Expected Return	Actual Market Returns	TRS Actual Returns
	June 30, 2008	Returns June 30, 2008	July 1, 2008-June 30, 2018	July 1, 2008-June 30, 2018
	%	%	%	%
Domestic Large Cap Stocks	48	6.5	10.2	10.2
Domestic Mid Cap Stocks	3	6.0	10.8	10.6
Domestic Small Cap Stocks	4	5.5	12.3	12.4
International Stocks	9	7.5	2.8	5.0
Emerging Market Stocks	0	6.5	2.6	
Fixed Income	31	4.6	3.7	4.7
Cash	2	3.5	0.33	0.4
Real Estate	3	8.5	5.3	6.8
Private Equity	1	11.5	9.5	10.9
Hedge Funds	0	8.0	3.4	
Total	100	6.3		8.02

# 2018 - 19 Return Forecast Model

		10 Year Assumptions		30 Year Assumptions	
		Expected Nominal Return	Expected Risk (Volatility)	Expected Nominal Return	Expected Risk (Volatility)
U.S. Large Cap Equity	37.4%	6.4%	17.0%	6.4%	17.5%
U.S. Small Cap Equity	2.6	6.6	23.0	6.9	23.5
Developed Int'l Equity	16.5	7.5	20.0	7.4	20.0
Emerging Markets Equity	5.5	7.7	27.0	7.7	27.5
Fixed Income – Inv Grade	15.0	3.2	4.0	3.5	5.0
Real Estate	7.0	6.1	12.2	6.1	12.2
Private Equity	7.0	8.6	24.0	8.6	24.5
Additional Category: High Yield	2.0	4.1	12.0	5.1	12.5
Other Additional Categories	5.0	4.7	8.9	5.6	9.4
Cash (LIBOR)	2.0	3.0	1.0	3.2	2.0
Total	100.0%	6.6%	12.9%	6.8%	13.2%

# Horizon Survey 2017 Assumptions (20-Year)

Asset Class	Target	Return
U.S. Large Cap Equity <sup>1</sup>	37.4%	7.8%
U.S. Small Cap Equity <sup>1</sup>	2.6%	8.4%
Developed Int'l Equity <sup>2</sup>	16.5%	7.6%
Emerging Markets Equity <sup>2</sup>	5.5%	8.7%
Fixed Income – Inv. Grade	15.0%	4.4%
Real Estate	7.0%	6.7%
Private Equity	7.0%	10.1%
Additional Category: High Yield	2.0%	6.2%
Other Additional Categories <sup>3</sup>	5.0%	5.7%
Cash	2.0%	3.2%
<b>Total TRS<sup>4</sup></b>	<b>100.0%</b>	<b>7.7%</b>

<sup>1</sup> Domestic mid cap equity is modeled as 80% domestic large cap equity and 20% domestic small cap equity

<sup>2</sup> International equity is modeled as 75% developed markets and 25% emerging markets

<sup>3</sup> Other Additional Categories is modeled as 50% high yield and 50% bank loans

<sup>4</sup> Inflation rate assumption is 2.4%



# **Teachers'** **Retirement System**

of the State of Kentucky

**800-618-1687**

**502-848-8500**

<https://trs.ky.gov>



# **Fiduciary Review of the Teachers' Retirement System of the State of Kentucky**

**Summary Presentation Regarding Conclusions, Considerations, and Recommendations Related to the TRS Investment Program**



**Aon Hewitt Investment Consulting, Inc.**  
**November 19, 2018**





## Scope of work

TRS requested that Aon review components of its investment program. We will address the following components today:

- a. Board authority and control relative to key investment responsibilities
- b. Investment objectives and risk
- c. Investment related activities including custodial services, securities lending and brokerage
- d. Investment fees/costs relative to peers

This reports follows a similar investment program review done in 2009.

# **Board Authority and Control Relative to Key Investment Responsibilities**

## **Section 3a**

# Board Authority

## ■ Conclusions

- Currently the TRS Board retains final authority for nearly all investment related responsibilities, both policy and implementation.
- The Board does not have final authority to approve its investment policy. Instead, an administrative regulation process must be used. This is inconsistent with best practice.
- The boards of a number of large public retirement systems delegate implementation of the investment policy they have adopted.
  - This is because investment implementation actions can often be made more effectively when executed by a team of investment experts rather than a board.
  - Ultimately, the degree of delegation depends upon the comfort level of the TRS Board with the staff's expertise, processes, and reporting that supports the delegation.
- When made, delegations should be expressed in writing and subject to ongoing monitoring.

## Board Authority

- Considerations
  - If the current process of investment implementation becomes overly constrained, the Board might consider delegating implementation of investment responsibilities to the internal investment team, subject to defined parameters and, strict reporting requirements, and ongoing monitoring.
- Recommendations
  - Seek legislative changes that eliminate the requirement for the Board's investment policies to be set forth in administrative regulations but maintain the requirements that the policies be developed or changed only at open meetings and be made widely available to interested parties.

# Investment Objectives and Risk

## Section 3b

# Regulatory Restrictions on Asset Allocation

## ■ Conclusions

- Administrative Regulations<sup>1</sup> (the Investment Policy Statement) currently contain various asset class restrictions with which TRS must comply.
  - The asset class restrictions were not derived as part of an asset liability study.
  - Most public funds follow the prudent person rule and modern portfolio theory.
  - Consistent with best practices, most peer public pension programs have eliminated statutory and/or regulatory asset allocation restrictions.
- We did not find that the maximums prevent TRS from constructing a well diversified institutional investment program.
- Investments that are restricted by the various requirements may be able to be held within the “additional categories”.

1. 102 KAR 1:175 and 102 KAR 1:178. Investment policies serve as the TRS investment policy statement

# Regulatory Restrictions on Asset Allocation

- Considerations
  - Consider undertaking efforts to eliminate the regulatory process necessary to establish asset class requirements and maximum allocations outlined in the Investment Policy Statement (Administrative Regulations).
- Recommendations
  - Continue to manage the active risk of the equity and fixed income portfolio holistically through ongoing holdings and returns based risk analysis.

\*Any change to the investment policy statement must be accomplished through a change to Administrative Regulations.

# Asset Allocation Formulation Process

## ■ Conclusions

- We found the asset/liability process used to develop asset allocation to be in line with best practice.
  - The analysis evaluates multiple complex scenarios in a streamlined manner , which allows a thorough understanding of the tradeoffs between risk and return, and the impact on future funding requirements.
- The asset liability process and ongoing annual asset allocation reviews are a best in class process to monitor TRS' stated "Investment Objectives" and "Risk Controls."
- TRS' underlying investment return and risk assumptions are similar to peer expectations.
- The liquidity analysis TRS performs is in line with best practice in risk management.

## ■ Considerations

- Continue to perform an asset liability study every 3 to 5 years or following meaningful changes in the underlying funding or benefit assumptions.

## ■ Recommendations

- None



# Asset Allocation, Expected Return, and Performance

- Conclusions

- The TRS asset allocation is generally in-line with peers.
- Over a 10-year period we expect the portfolio to produce a return of 6.7%, with a 50% probability of returns ranging from 5.1% and 8.3%.
- Over the trailing 5-year period TRS has outperformed its benchmark at a commensurately higher level of risk (volatility).
- TRS Risk adjusted results are strong relative to peers over the trailing 5-year period, as TRS has outperformed most peers with a similar level of risk.
  - Peer plans with a higher allocation to alternatives will appear lower risk due to the difference in valuation between public and private assets.

- Considerations

- None

- Recommendations

- None

# **Investment Related Activities Including Custodial Services, Securities Lending and Brokerage**

## **Section 3c**

## Custodial Services

- Conclusions

- TRS' decision to utilize a sole custody provider greatly reduces operational risks while increasing operational efficiencies.
- AHIC has a favorable opinion of BNYM's custody capabilities.
- TRS conforms with best practice in its cycle for reviewing its custody contract and fees to determine reasonableness relative to market rates.
- A majority of the overall custody fees paid by TRS are below the averages of peers.

- Considerations

- Consider conducting a custody fee review every one to three years to determine reasonableness relative to market rates.

- Recommendations

- None

# Securities Lending

## ■ Conclusions

- AHIC has a favorable view of BNYM's capabilities as a securities lending agent.
- It is best practice to review the securities lending agreement every 1 to 3 years to determine if guidelines remain suitable. TRS practices conform with best practice.
- Staff has a sound understanding of the risks associated with the expanded securities lending program and has taken the appropriate steps to best mitigate them through documentation and ongoing monitoring.
- Repurchase transaction guidelines surrounding the TRS cash collateral portfolio are sufficient.
- BNYM provides a favorable level of indemnification compared to some other securities lending agents.
- The level of monitoring and review of the securities lending program appears to be sufficient.

## ■ Considerations

- Consider working with the investment consultant to analyze and review the agreement and results of the securities lending program on an annual basis.

## ■ Recommendation

- None

# Brokerage

## ■ Conclusions

- The TRS practice of executing trades for external managers is less common among peers.
- We concur with the manner in which TRS delegates trading to external managers.
- Each of the trading tools utilized by Staff are considered best-in-class among the industry and provide the ability to prudently execute equity and fixed income trades.
- Staff has an appropriate due diligence process and decision-making pathway to identify and procure tools necessary to support the brokerage operation.
- TRS' use of an independent provider to evaluate execution and transaction costs is consistent with best practice.
- For the 1-year period ending 6/30/17, TRS' total execution and commission costs were materially lower than the peer universe.
- TRS' approach to approving and evaluating all brokers from a quantitative and qualitative aspect is consistent with best practice.
- The TRS Investment Committee is annually reviewing trading costs.

## ■ Considerations

- Consider exploring options for a third party TCA provider for fixed income execution.

## ■ Recommendations

- Review brokerage costs and practices with the entire Board annually.

# **Investment Fees/Costs Relative to Peers**

## **Section 3d**

## Investment Fees/Costs Relative to Peers

- Conclusions
  - Fees associated with the TRS portfolio are low relative to peers.
  - As the alternative investment portfolio has grown, the fees associated with the program have grown.
- Considerations
  - Consider participating in an investment management expense benchmarking database to better facilitate expense monitoring.
  - Consider formalizing a periodic schedule for the Board or Investment Committee to review the investment management expense benchmarking information.
- Recommendations
  - None

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# The Power of Personalized Medicine and its Impact on Healthcare

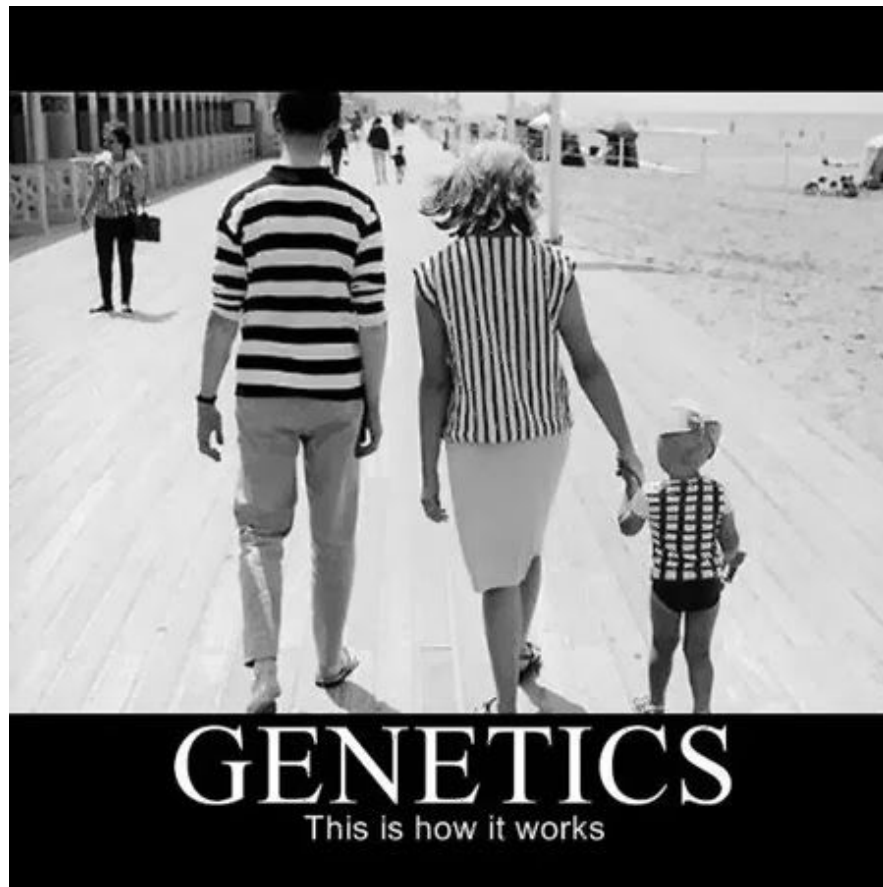


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LIFE SCIENCES

**Tailoring medical treatment  
to the individual  
characteristics of each  
patient.**



# HOW DOES IT WORK?



# WHAT DO WE INHERIT?



- Hair color and texture
- Eye color
- Heart health
- Breast cancer
- Height
- Metabolism of medications

# Help people make informed decisions about managing their health care<sup>1</sup>

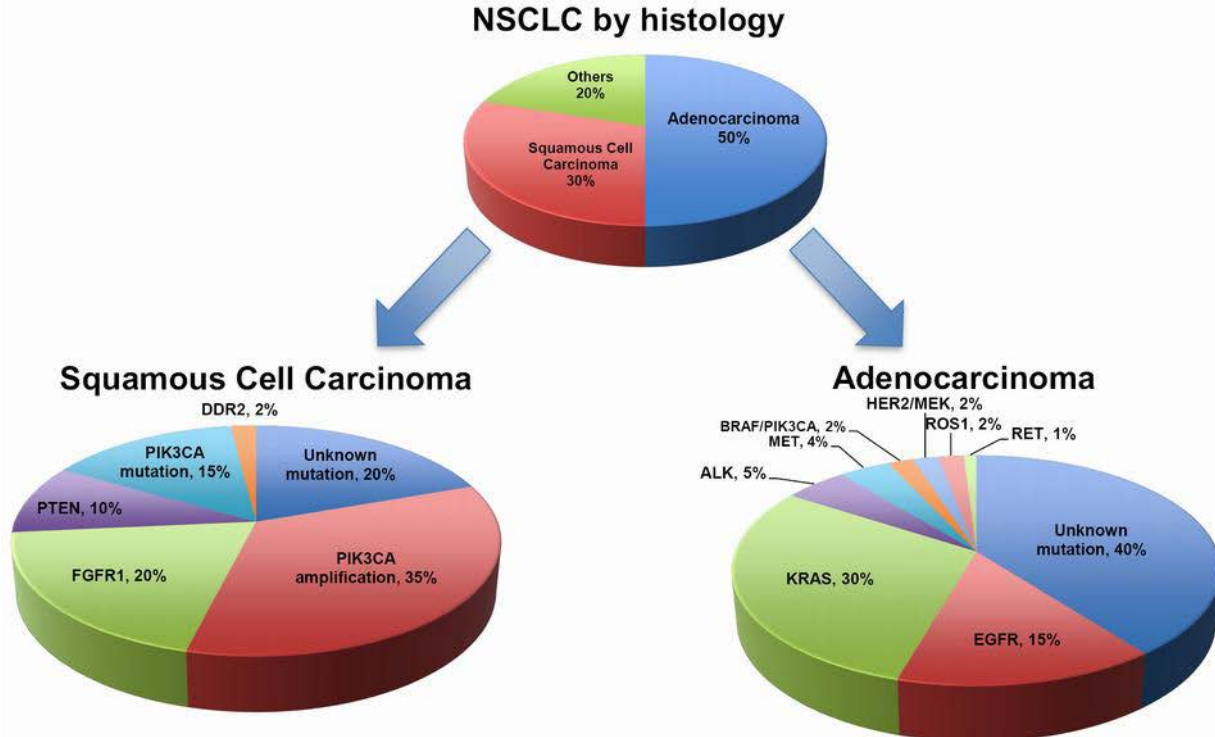
- Risk Predilection – predisposition to disease, e.g. enlarged heart
- Diagnosis – e.g. metabolic diseases, cystic fibrosis
- Companion Diagnostics – e.g. oncology
- Pharmacogenomics – improved outcomes through targeted treatments and reduced side effects

1. NIH, Genetics Home Reference (Nov. 7, 2018). What are the benefits of genetic testing?  
Retrieved from <https://ghr.nlm.nih.gov/primer/testing/benefits>; Accessed Nov 11, 2018

# PARADIGM SHIFT IN CANCER PERSONALIZED TREATMENT TOWARDS MOLECULAR SUBSETS OF CANCERS

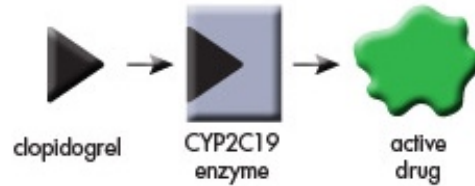
## Example:

Non-Small Cell Lung Carcinoma is not a single type of cancer, but has many subtypes; each needs tailored treatment.

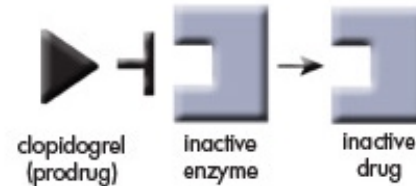


# WHY MOST DRUGS ONLY WORK IN SOME PATIENTS

Normal



Variant



**27% of US  
population  
can not  
metabolize  
clopidogrel!**

# HEALTHCARE COSTS ARE SPIKING



**82%** of Americans take at least one medication



**50%** of the medications patients take are ineffective

**4<sup>TH</sup>**

Leading cause of death in the US is

Adverse Drug Reactions.



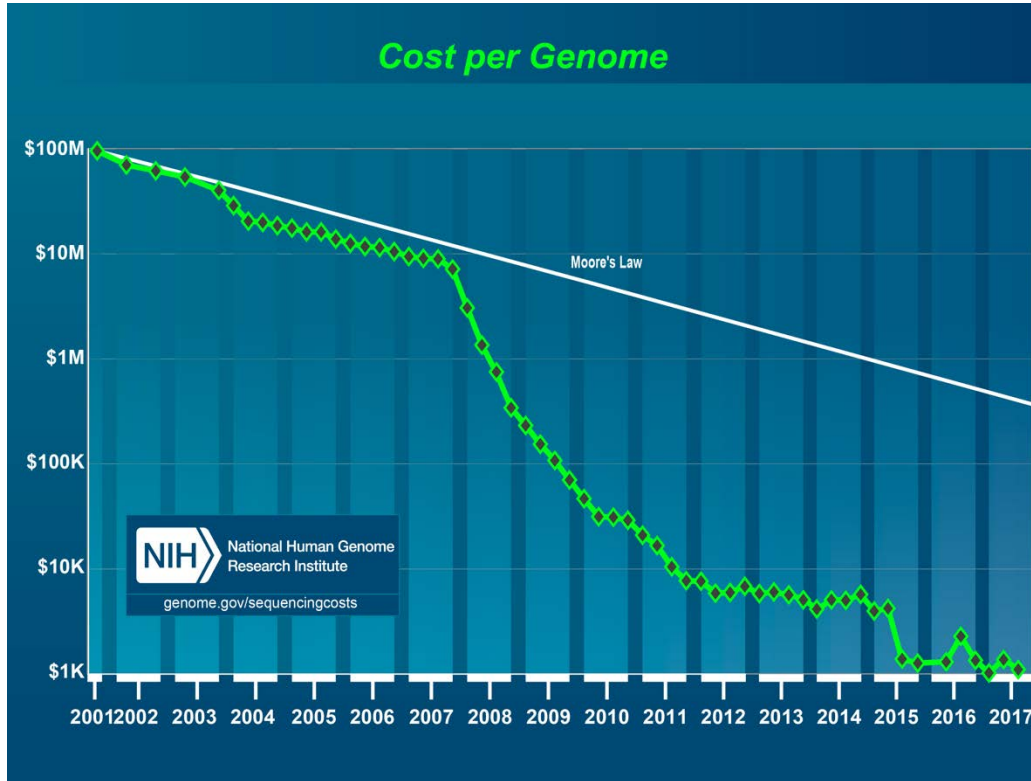
# HEALTHCARE COSTS ARE SPIKING



Yearly, this translates into:

- 128,000 Deaths
- >2 million Emergency Department visits
- >1,500,000 Hospitalizations
- 3.5 million Physician office visits
- 1.7– 4.6 Increased days per effected hospital stay
- 20.4% of hospital re-admissions

# COST OF GENETIC TESTING IS DROPPING



National Human Genome Research Institute (July 6, 2016). The Cost of Sequencing a Human Genome. Accessed Nov. 11, 2018

# GENOMIC MEDICINE SHOULD BE EVIDENCE-BASED AND PATIENT-CENTERED

## DOES IT:

- ✓ change a patient's therapy management?
- ✓ improve outcomes?
- ✓ improve quality of life?
- ✓ improve productivity?
- ✓ change how family members are managed?
- ✓ lower health care cost in the long run?



# TOO FAMILIAR...



## **Linda, age 73**

- Currently taking 9 prescription medications and 3 vitamins
- Type 2 diabetes
- High cholesterol
- Arthritis
- Family history of cardiac issues
- Constant joint pain
- Restricted mobility
- Hospitalized twice this year



# TOO FAMILIAR...

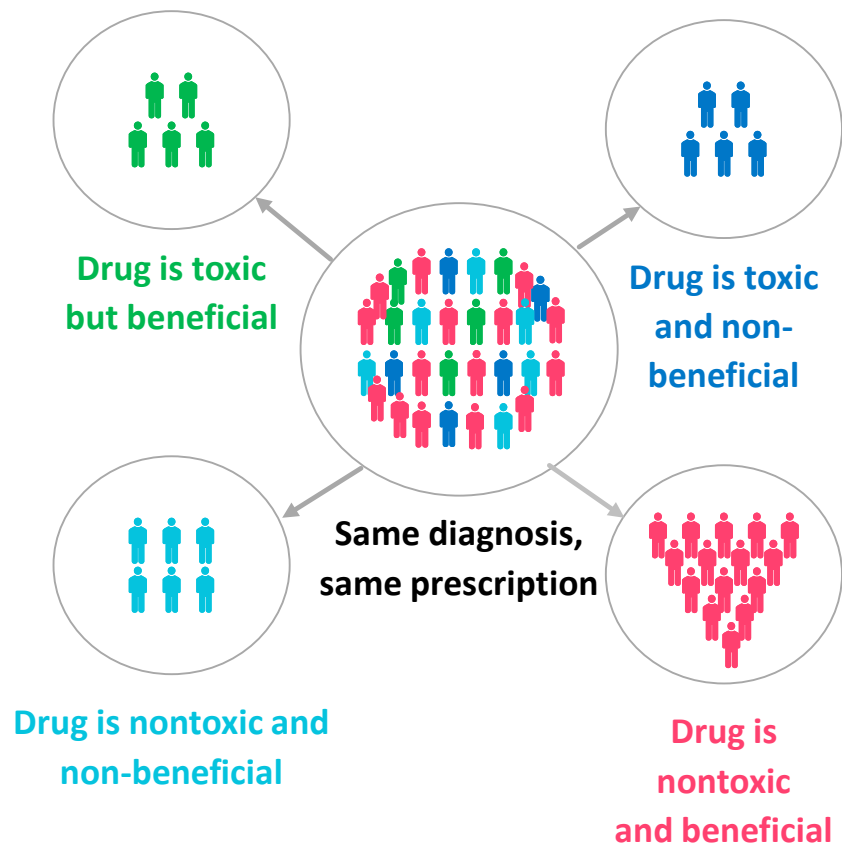


## Linda's doctor doesn't know:

- Linda's morning glass of grapefruit juice is preventing one of her medicines from working
- Three of her meds are conflicting and causing side effects
- Two other meds are completely ineffective for her because of her genetics



# YOUR DNA MATTERS



## "Pharmacogenomics" (PGx)

Using DNA to see what drugs  
will be safe and effective

# SO MANY VARIABLES...

Are these drugs safe?

Are they all necessary?

Are they going to work?

## Medications Taken Together Have Risks:

- ✓ Genetic metabolism risks
- ✓ Genetic adverse reaction risks
- ✓ Genetic competitive inhibition
- ✓ Drug interaction risks
- ✓ Contraindications
- ✓ Pregnancy/lactation risks
- ✓ Juvenile risks
- ✓ Anticholinergic burden risks
- ✓ Geriatric toxicity risks
- ✓ Lifestyle risks
- ✓ Duplicative therapy warnings
- ✓ FDA black box warnings
- ✓ Reported side effects
- ✓ Drug label warnings

# DNA TESTING IS NOT SUFFICIENT

Need to bring together rigorously-vetted genetic guidance with **dozens of other factors** of patient-specific prescribing risk.

**Healthcare providers should be empowered with answers** rather than research materials.

Real-time modeling should allow pharmacists and doctors to see the results of medication changes **before** they experiment with them on their patients.





# E-PGx PROGRAM COMPONENTS

Enterprise PGx is a turn-key program that combines genetic testing with expert pharmacy review to provide what physicians really need – credible and immediately actionable treatment guidance.



## Population Analytics

“Will this program provide benefit for our members?”



## Member Engagement

Fully-coordinated education and enrollment



## Genetic Testing

Cost-effective DNA testing by CLIA-licensed laboratories



## Pharmacy MTM Review

Clear, actionable recommendations via Medication Action Plan (MAP)

# CASE STUDIES

“We can actually apply this at national scale, cost effectively, to save money for the healthcare system and to improve patient outcomes.”

- Peter Silvester

SVP Life Science Solutions, ThermoFisher Scientific

## 01 Senior Populations

- 34,000 retirees in a system facing extreme economic pressures

## 02 Large Employer

- 30,000 ‘working well’ employees

# POPULATION ANALYTICS

34,000 retirees aged 65 to 107

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LIFE SCIENCES

Using de-identified claims information, CLS provided the pension fund with an in-depth analysis of the potential return on investment with the program.



**15**

**Average # of prescriptions**



**75%**

**Had high BP/heart disease**



**58%**

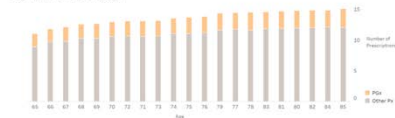
**Had high cholesterol**



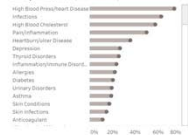
**50%**

**Had pain/inflammation**

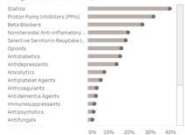
Avg # of Prescriptions by Age



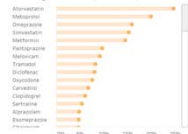
Likely Indication (% of Patients)



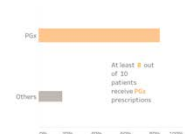
Drug Class (% of Patients)



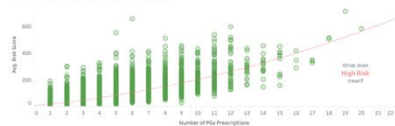
PGx Drugs Prescribed (% of Patients)



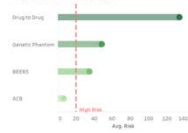
Overall % of Patients with PGx



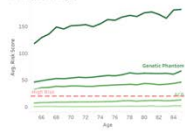
Risk Levels vs Number of PGx Prescriptions



Avg. Degree of Risk by Type



Risk Type and Age



PGx Cost Implications



% of Patients At Risk



# POPULATION ANALYSIS

## PGx Drugs Prescribed (% of Patients)

Atorvastatin

Metoprolol

Omeprazole

Simvastatin

Metformin

Pantoprazole

Meloxicam

Tramadol

Diclofenac

Oxycodone

Carvedilol

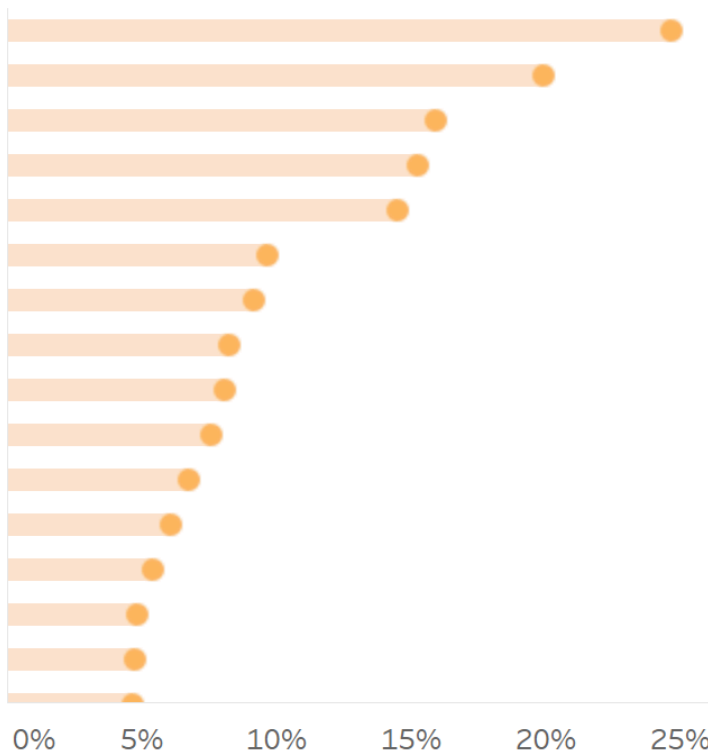
Clopidogrel

Sertraline

Alprazolam

Esomeprazole

Citalopram

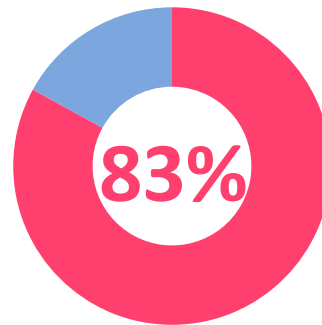


# POPULATION ANALYTICS

34,000 retirees aged 65 to 107

Using de-identified claims information, CLS provided the pension fund with an in-depth analysis of the potential return on investment with the program.

% of Patients taking meds that  
have known PGx implications



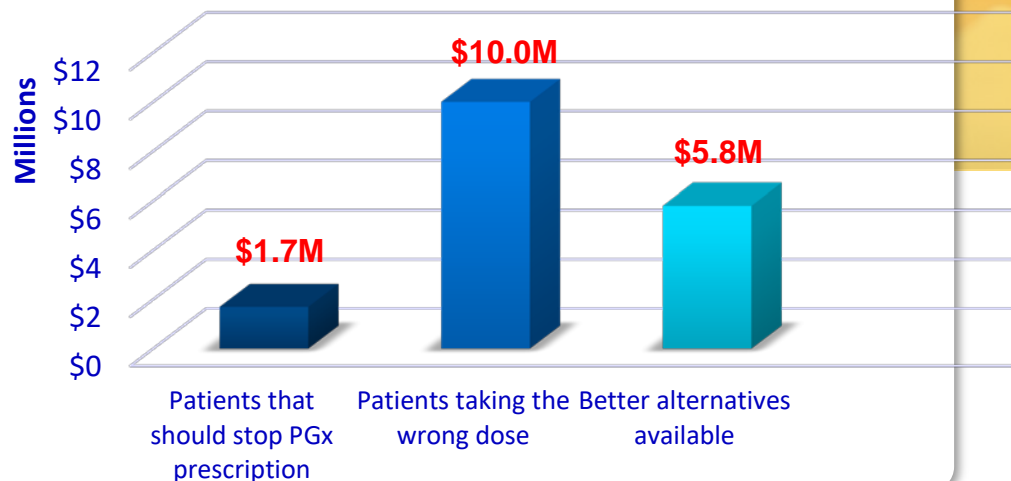


# POPULATION ANALYTICS

34,000 retirees aged 65 to 107

Using de-identified claims information, CLS provided the pension fund with an in-depth analysis of the potential return on investment with the program.

## Annual Misdirected Spend



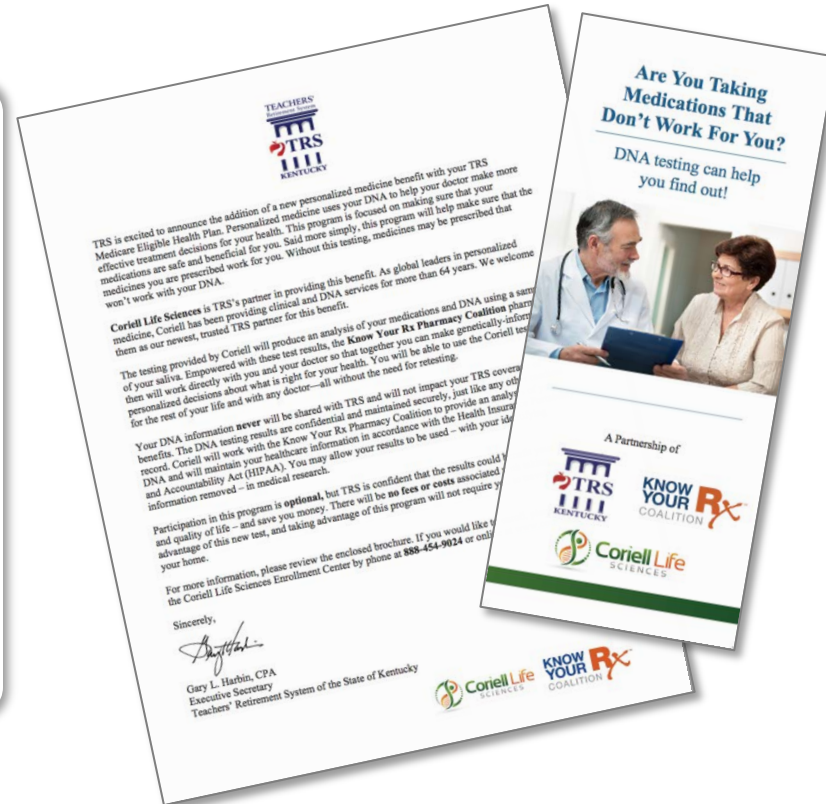
TRS will reduce healthcare costs by implementing a program focused on improving medication safety and efficacy for its members.

The program will utilize genetic testing and personalized therapy analysis delivered to physicians through expert pharmacist consultation.

# INVITE AND ENROLL MEMBERS

## Key Messages:

- ✓ We are making smarter use of healthcare dollars with a new personalized medicine program.
- ✓ We have engaged partners to work with your doctor.
- ✓ This new benefit will test your DNA to make sure your medications will be safe and effective for you.
- ✓ The analysis and test results will only be used by pharmacists and your doctor. Your information will not be shared with us.





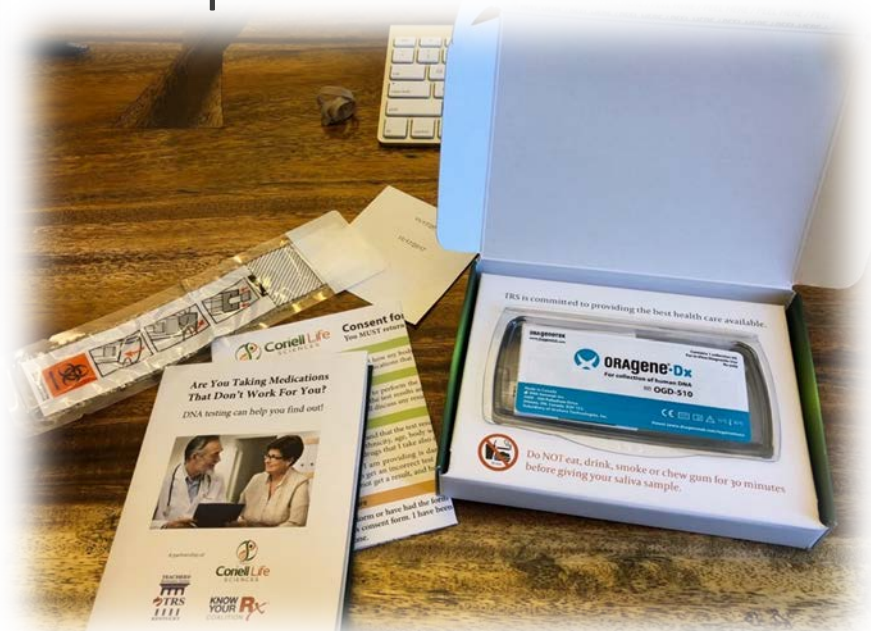
# DNA COLLECTION KITS

CORIELL  
LIFE SCIENCES

DNA Collection kits sent  
to members' homes  
upon enrollment

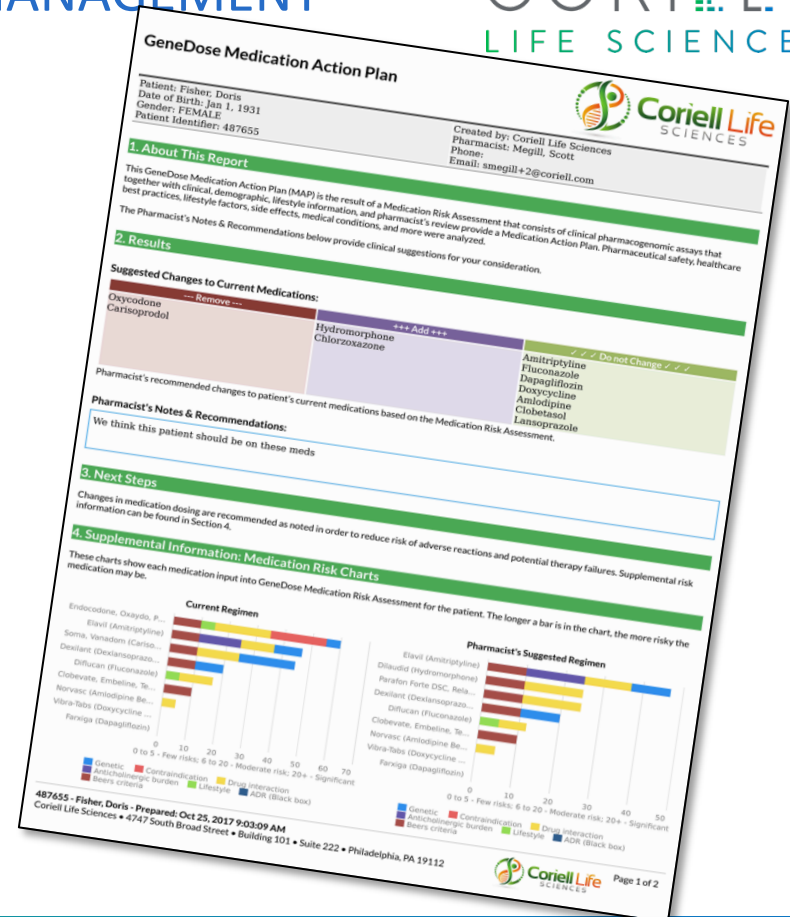


Kits returned in same box,  
processed by lab  
within 2 weeks



# COMPREHENSIVE MEDICATION SAFETY MANAGEMENT PROGRAM OVERVIEW

1. Enroll Members
2. Collect genetic information
3. Empower pharmacists with MTM software and genetic guidance
4. Communicate the Medication Action Plan



# METRICS OF SUCCESS

As of Wednesday, Nov 14,

## Invited

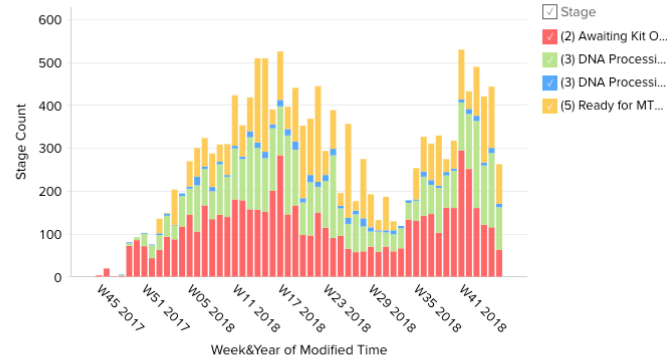


Enrolled  
5,931

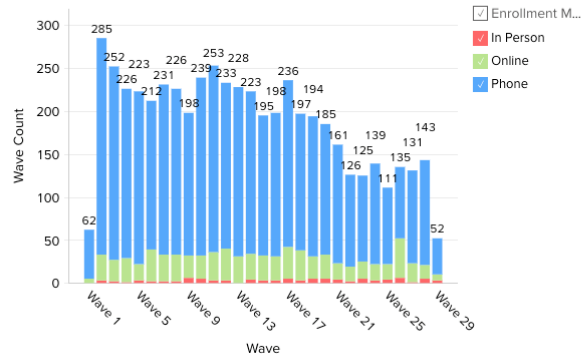
## TRS Stage Summary

	Stage	Count
1	(0) Not Contacted	5930
2	(2) Members with Kits	1477
3	(3) DNA Processing	345
4	(4) Ready for Coalition	3890
5	(X) Not Interested	7888

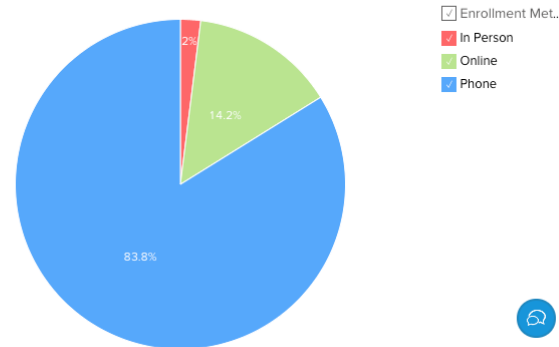
## Weekly Progress



## Enrollments by Wave



## Enrollment Method



## METRICS OF SUCCESS

- ✓ 64% resulted in medication change recommendation



# MA3 – COST OF GETTING IT WRONG

## MA3

- Medication Adherence
- Medication Appropriateness
- Medication Adversity

### Components of MA3 Cost

Clinic outpatient visits	0.64%
Specialty office visits	0.82%
Employee work days missed	0.95%
Laboratory services	0.09%
Urgent care visits	0.48%
Emergency room visits	2.99%
Hospital admissions	67.18%
Home health visits	25.31%
Durable medical goods	1.55%

### Medication Adherence

- Limited patient engagement in treatment decisions
- Cost
- Low perceived need/efficacy
- Concern about side effects
- Forgetfulness
- Lack of social support
- Impaired cognition
- Unclear or misunderstood medication instructions
- Low health literacy
- Complex drug regimen/high pill burden

### Medication Appropriateness

- Is there an indication for the drug?
- Is the medication effective for the condition?
- Is the dosage correct?
- Are the directions correct?
- Are the directions practical?
- Are there clinically significant drug-drug interactions?
- Are there clinically significant drug-disease interactions?
- Is there unnecessary duplication with other drugs?
- Is the duration of therapy acceptable?
- Is this drug the least expensive alternative?

### Medication Adversity

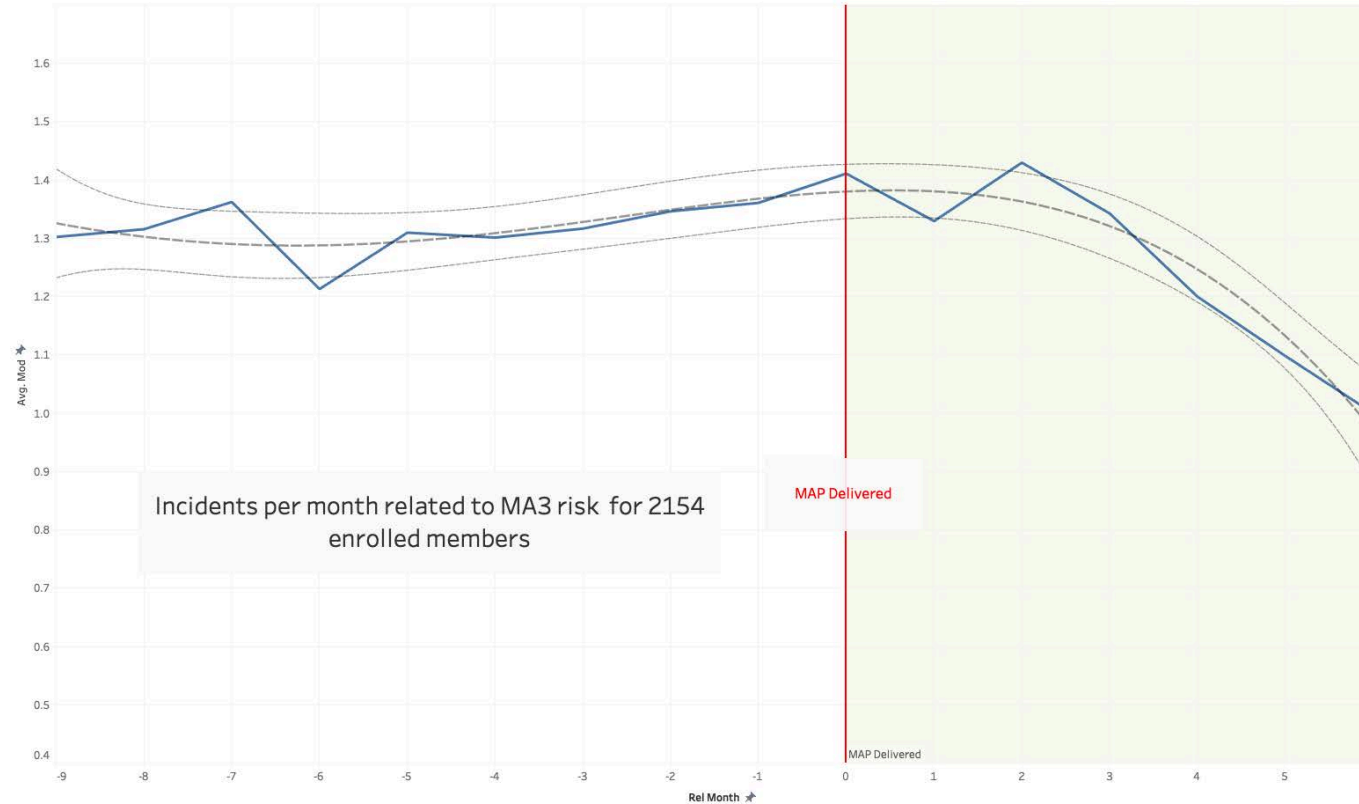
- Dose-related
- Non-dose-related
- Dose-related and time-related
- Time-related
- Withdrawal
- Failure of therapy

PGx  
Empowered  
d MTM

- ↓ Adverse drug events
- ↑ Patient satisfaction
- ↑ Overall patient health
- ↑ Quality-of-life
- ↑ Use of generic medications
- ↓ Cost of medications
- ↓ Number of outpatient visits
- ↓ Costs of outpatient visits
- ↓ Number of laboratory tests
- ↓ Emergency department visits
- ↓ Number of hospitalizations
- ↓ Costs of Hospitalization

# RISK REDUCTION

MA3 Issues

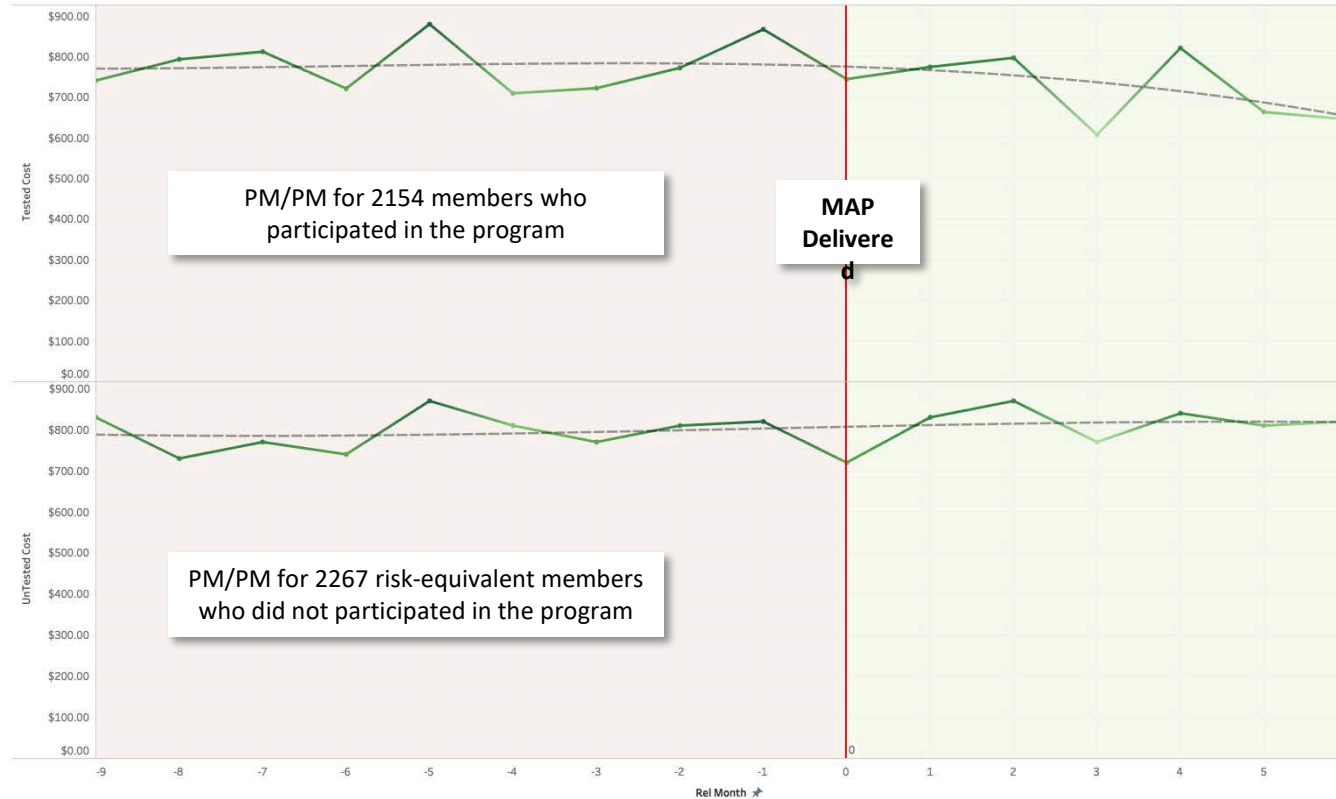


28%

Reduction in MA3 related  
risk incidents

# COST REDUCTION

Cost Per Member



17%

Reduction in cost-to-plan  
spending after 6 months

2.5%

Increase in control group



# MEMBER FEEDBACK

*"It's been years since I've seen something come through to make me stop and say, 'Wow! This is a great idea.'"*

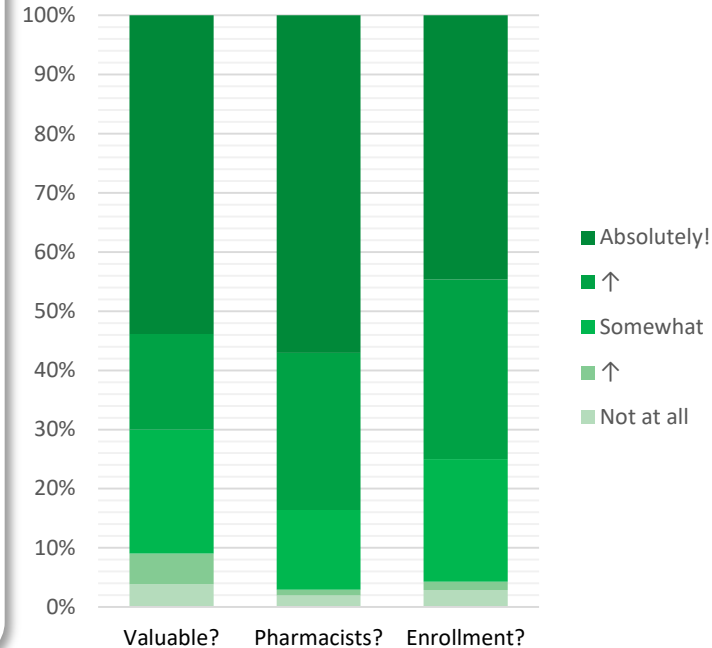
*"This is very much needed!"*

*"I am so excited about this benefit!"*

*"This is wonderful! It's nice to see TRS participating in new and more exciting things!"*

*"This came at the best time!"*

*"This is what healthcare should be."*





# MEMBER FEEDBACK

I heard about DNA testing regarding prescriptions on a national news story 2 years ago. I thought at that time that this was the future of medicine. I never dreamed that I would be asked to be part of the pilot program for DNA testing for prescriptions in Kentucky. Thanks to Jane Gilbert and Gary Harbin for having the foresight to see that this would be very important to our Kentucky Retired Teachers. **I did the testing and thank goodness I did because 2 of my medicines were not working well together.** Thanks to Lea G. at the (KY)Rx Coalition for working with me to get the medicine issue resolved. Once again, I am proud to be a retired teacher in Kentucky where TRS is looking out for the well being of its members!!!

The results showed that the cholesterol medicine I was on was not metabolizing well. The [KY]RX nurse said there were other drugs in a different family that could work without the same problem. My doctor was notified and the change was made. **I have far more energy now.**

*... (The pharmacists) did say that one of my medications that I take once a day was only working for the first few hours due to my DNA and that I should discuss it with my doctor. My doctor had the report, he checked it and agreed with the pharmacist. I now take that pill 2 times a day and I can tell a difference in my stamina for the afternoon. As friends get together, the DNA test is the topic of conversation. The people who have completed the process loved it, the ones who haven't gotten their results are anxiously awaiting and the other people are searching for the number to call so they can start the process. Thanks!*

## OTHER METRICS OF SUCCESS

- ✓ 64% resulted in medication change recommendation
- ✓ 94% of recommendations accepted by prescribers

### Resulting in:

- ✓ 29% reduction in hospitalizations
- ✓ 17.9% reduction in pharmacy spend
- ✓ 24% reduction in slip and falls

"I believe it would be **unethical** not to have all of our participants tested."

- George Brett MD, Medical Director



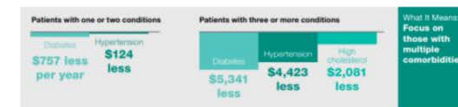
# LARGE SELF INSURED COMPANY

- ✓ By applying MA3 effect ratios to the virtual medical record for each member, we can see a maximum potential annual savings per-indication.
- ✓ **Conclusion:** If the company tested every MA3 affected member, we would expect a **\$21.7M reduction** in total annual healthcare costs.

Likely Indication	Number of Members	EPGx Savings
ANTICOAGULANT	418	\$511,870
ANXIETY	2,607	\$7,451,597
ASTHMA	4,141	\$5,726,808
CANCER	383	\$3,558,316
CHEMICAL DEPENDENCE	107	\$379,465
COPD	168	\$75,398
DEPRESSION	4,879	\$9,351,797
DIABETES	2,163	\$1,807,045
GI DISORDERS	768	\$1,897,909
HEART DISEASE	163	\$199,605
HIGH BLOOD CHOLESTEROL	4,181	\$2,222,038
HIGH BLOOD PRESS/HEART DISEASE	6,584	\$3,136,262
HIV	125	\$384,692
OSTEOPOROSIS	154	\$277,678
PARKINSONS DISEASE	169	\$503,985
SEIZURES	1,269	\$4,650,616
<b>Grand Total</b>		<b>\$21,785,543</b>

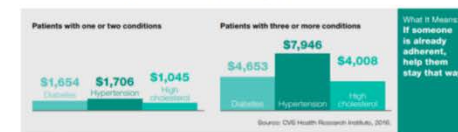


Patients Who Became Adherent Had Lower Overall Annual Costs



What It Means:  
Focus on those with multiple comorbidities

Patients Who Became Non-adherent Had Much Higher Annual Costs



What It Means:  
If someone is already adherent, help them stay that way

Total savings opportunity identified using data compiled from more than 200 peer reviewed publications, greater than 200,000 clinical pharmacogenomic reports run by Coriell, and outcomes information from 5+ years of commercial implementation.

#### References

[https://docs.google.com/document/d/11vcQHGRQr9Piyb\\_gAN99Vuxojdm1Qndixi5y6sq/qd-it?usp=sharing](https://docs.google.com/document/d/11vcQHGRQr9Piyb_gAN99Vuxojdm1Qndixi5y6sq/qd-it?usp=sharing)

# THANK YOU

## Contact information:

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Teachers' Retirement System Kentucky  
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Jeffrey Shaman, Chief Science Officer  
Coriell Life Sciences  
[jshaman@coriell.com](mailto:jshaman@coriell.com)



## Where we came from...



Coriell Life Sciences (CLS) is the commercial venture of the world-renowned Coriell Institute for Medical Research, a non-profit biomedical research institution, founded in 1953, dedicated to studying the human genome.

In 2007, the Institute launched the Coriell Personalized Medicine Collaborative (CPMC), a research study seeking to understand the value of genetic risk and pharmacogenomics in clinical decision-making and healthcare management. The results of that study led to the founding of Coriell Life Sciences in 2013.

## What we do...

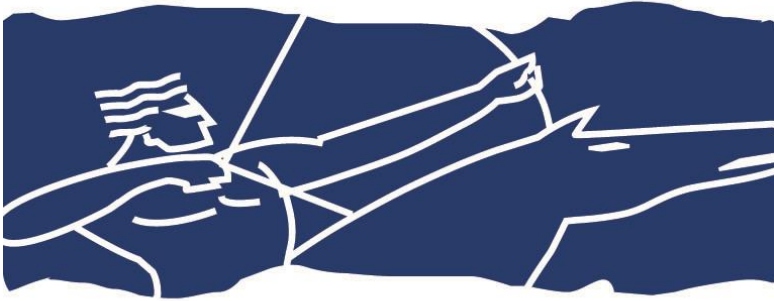


Today, CLS is a trusted provider of genetic laboratory interpretation and reporting services. We offer the most comprehensive medication safety solution on the market. We also provide precise, gene-based diagnostic reporting.

We work with large populations of patients to implement pharmacogenomic-empowered medication management solutions to improve patient health and reduce cost.

**We're leveraging the power of genomics to bring the best available information to physicians and their patients.**

# TODD



ASSET MANAGEMENT LLC

## I CAN SEE NORMAL FROM HERE

CURT SCOTT, CFA  
TODD ASSET MANAGEMENT  
NOVEMBER 19, 2018

TODD



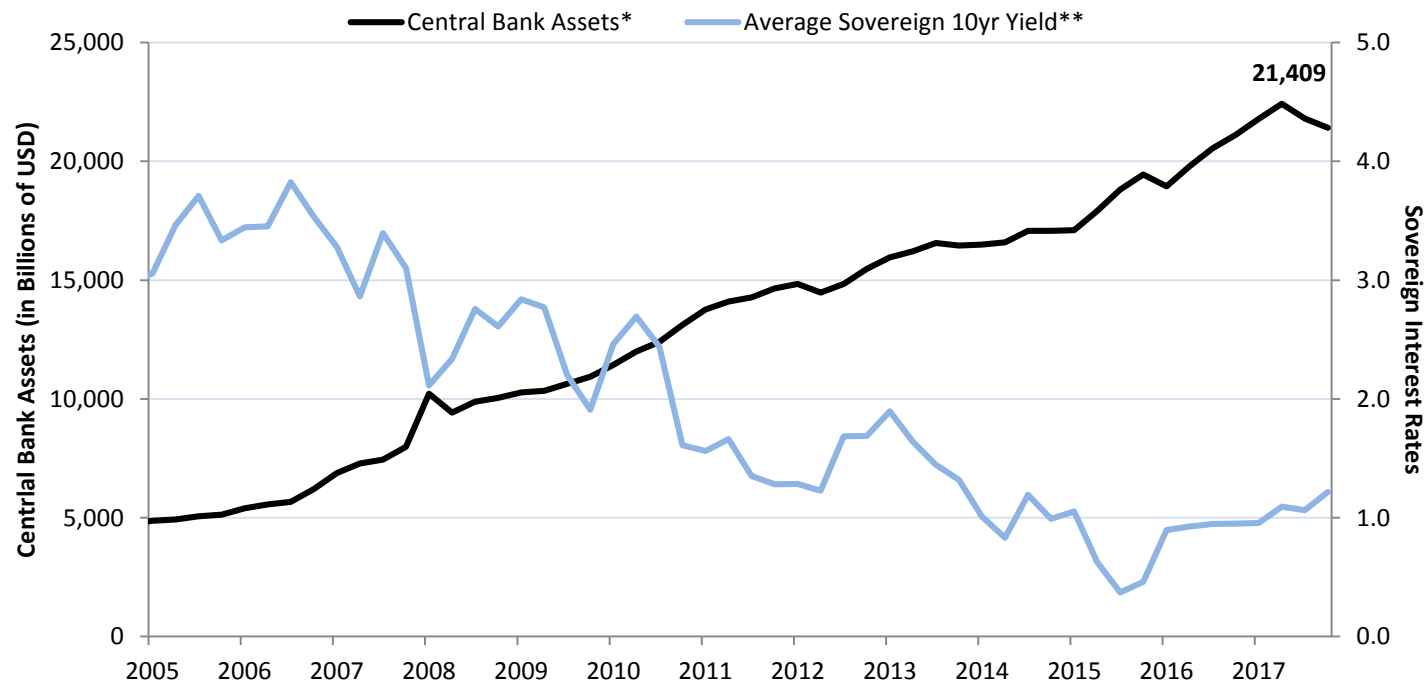
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- **Central Bank Balance Sheets Stabilizing**
- **Negative Yields Normalize Higher**
- **Global GDP Growth Continues**
- **No Recession in Sight**
- **Geo-Political Concerns Exist**

# CENTRAL BANKS DEBT PURCHASES ARE SLOWING

## 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.

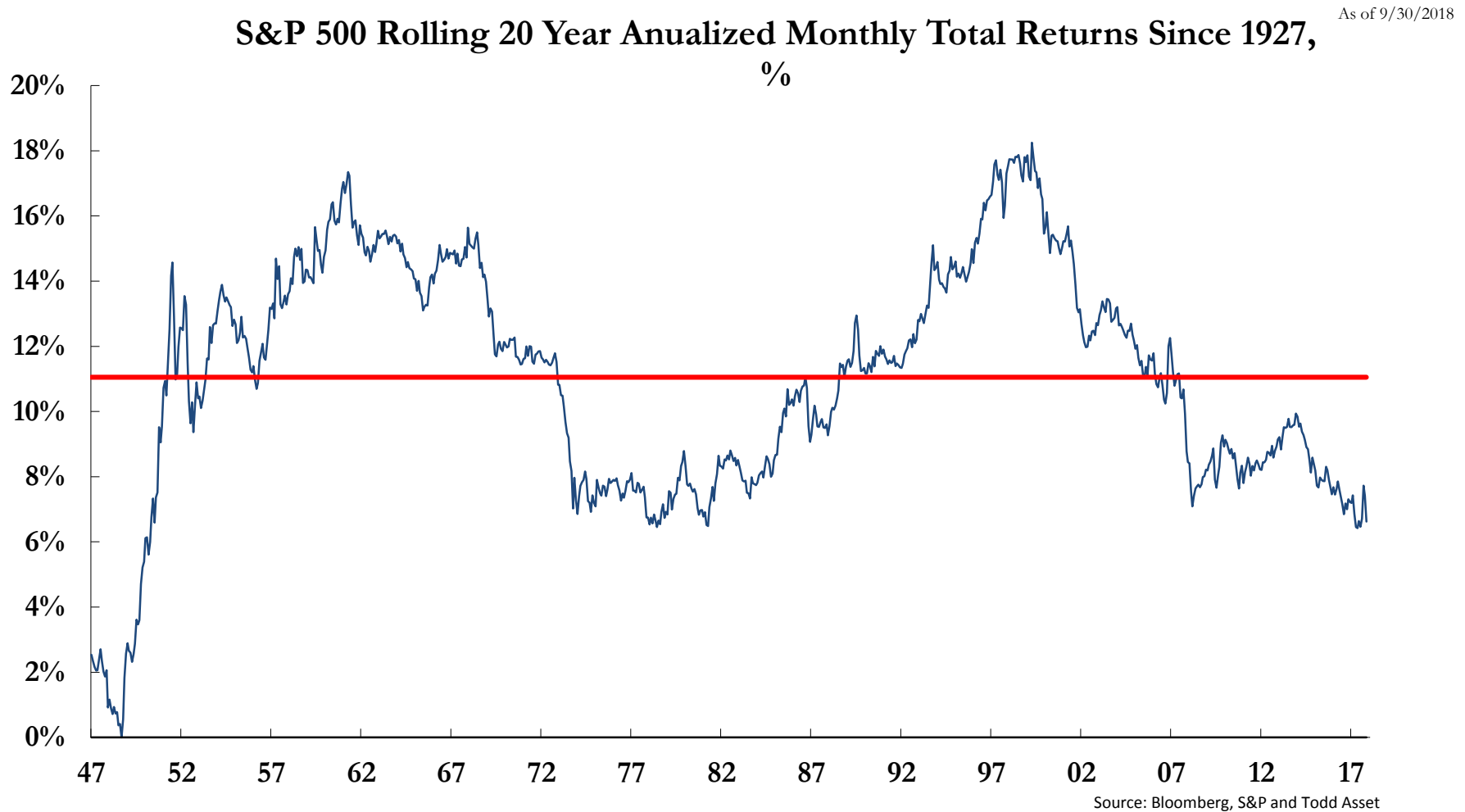
\*\*Average 10yr yield of the US, Japan and Germany.

Data as of 9/30/2018

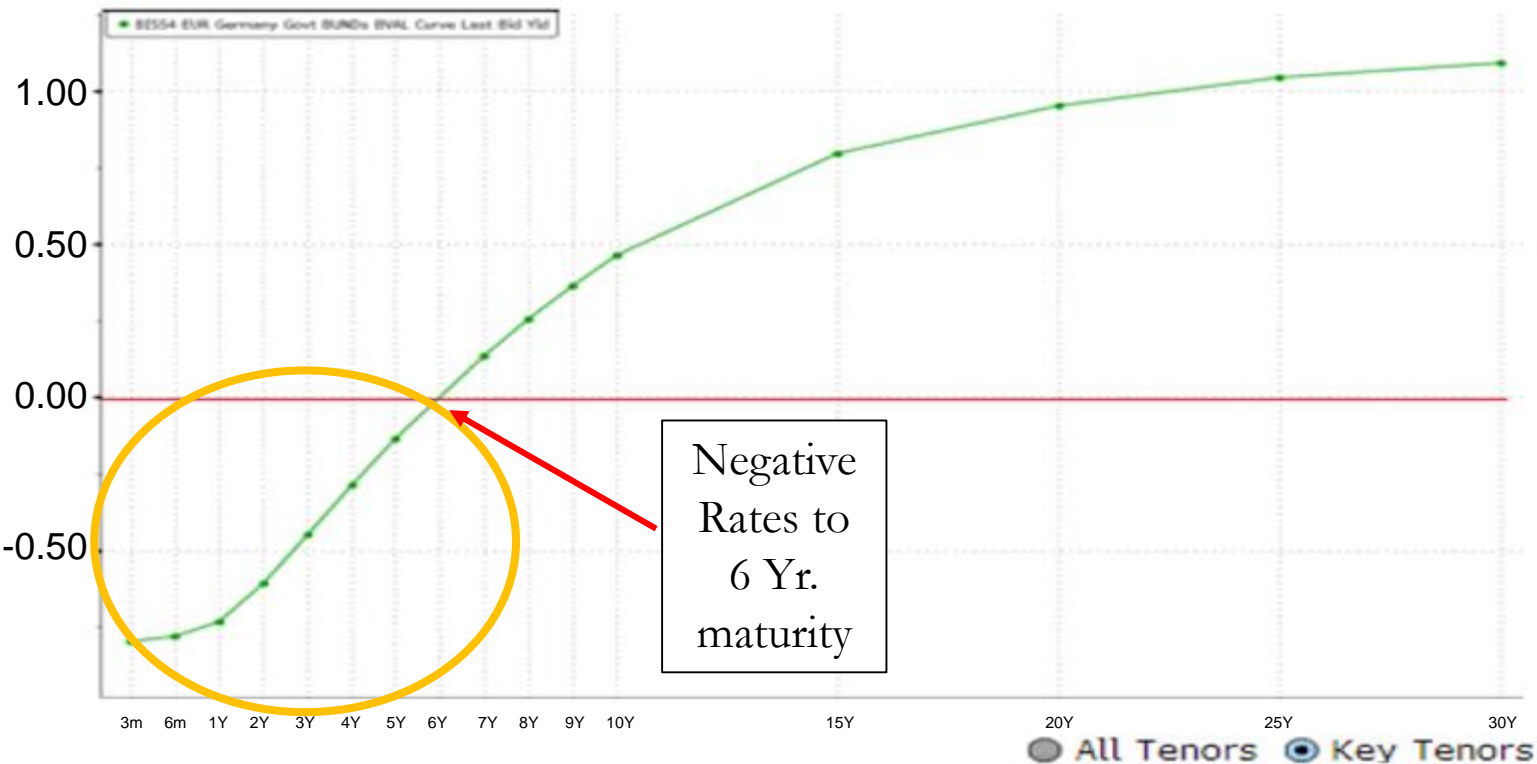
Source: Bloomberg and Todd Asset Management



# A SECULAR WAVE TOWARDS STOCKS CONTINUES



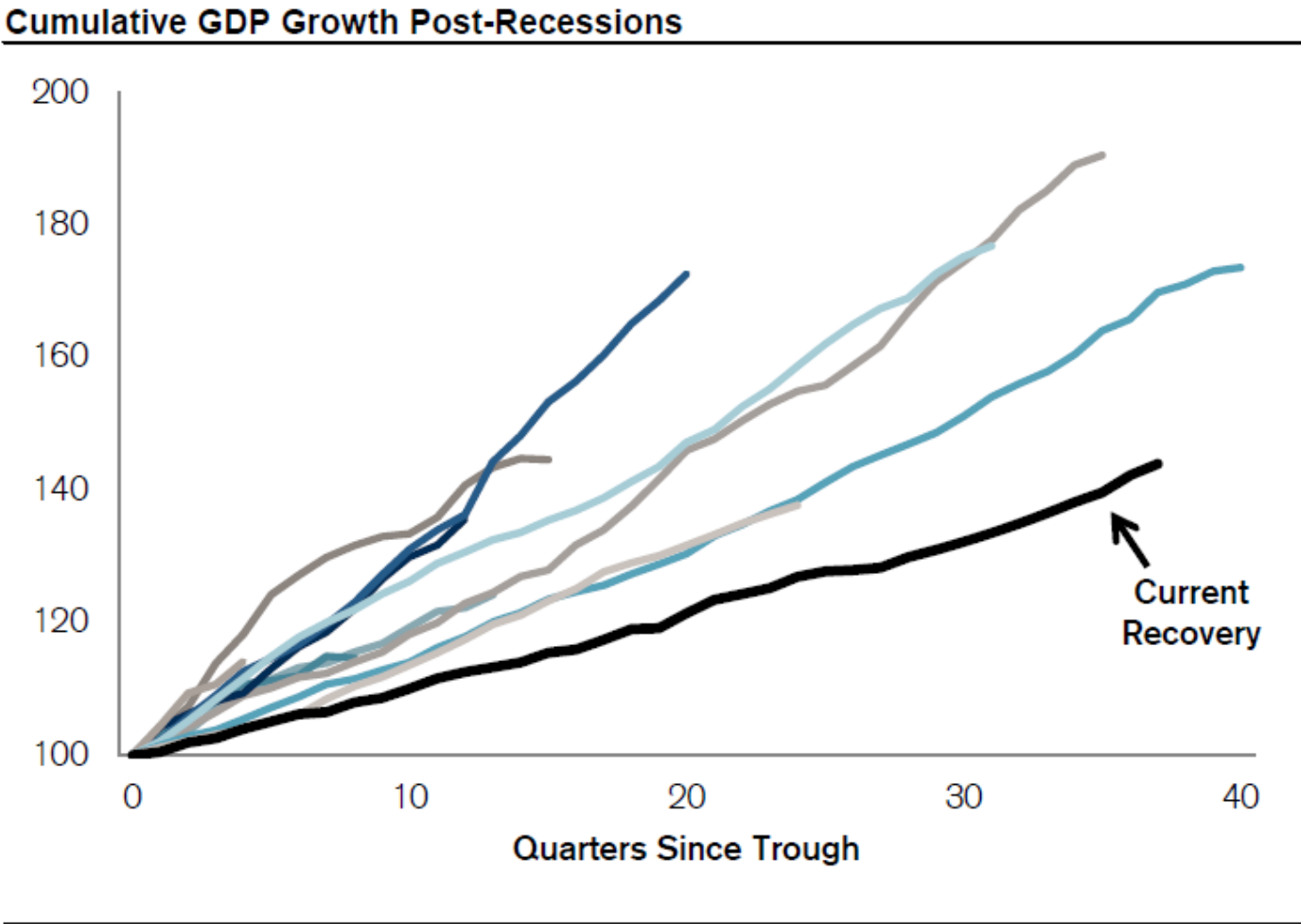
# SHORT TO MEDIUM TERM GERMAN YIELDS ARE NEGATIVE-NOT NORMAL



Curve ID	3M	1Y	2Y	3Y	5Y	10Y	15Y	30Y
11) BI554	-0.797	-0.732	-0.606	-0.449	-0.136	0.463	0.796	1.092

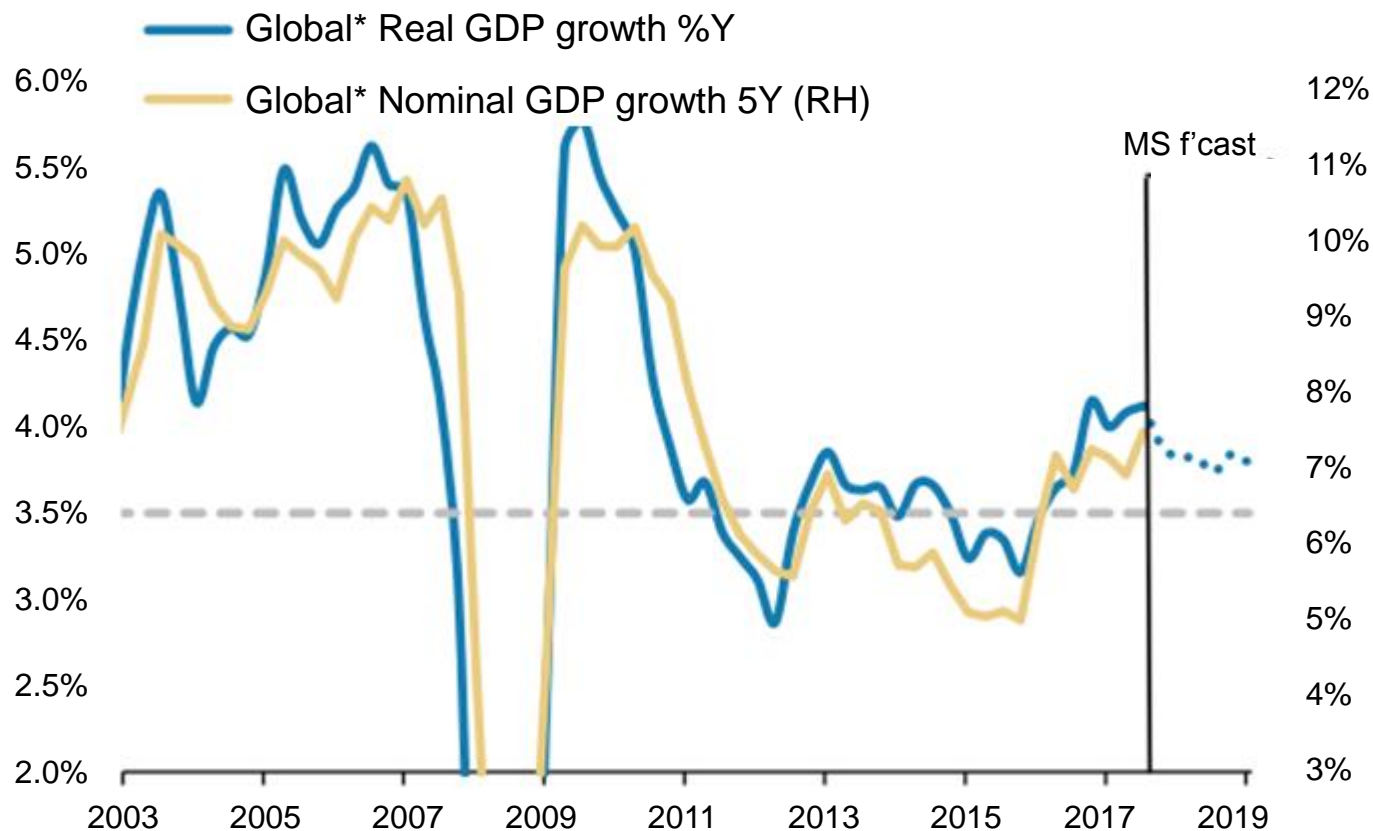
Bloomberg Finance L.P.

# A LONG AND WEAK RECOVERY- NOT NORMAL



Note: 1949 to present; Cumulative nominal GDP since trough indexed to 100  
Source: BEA, NBER, ISM, Haver Analytics®, Credit Suisse

# GLOBAL GDP STILL GROWING ABOVE TREND



# COULD WE STILL BE EARLY IN THE CYCLE?

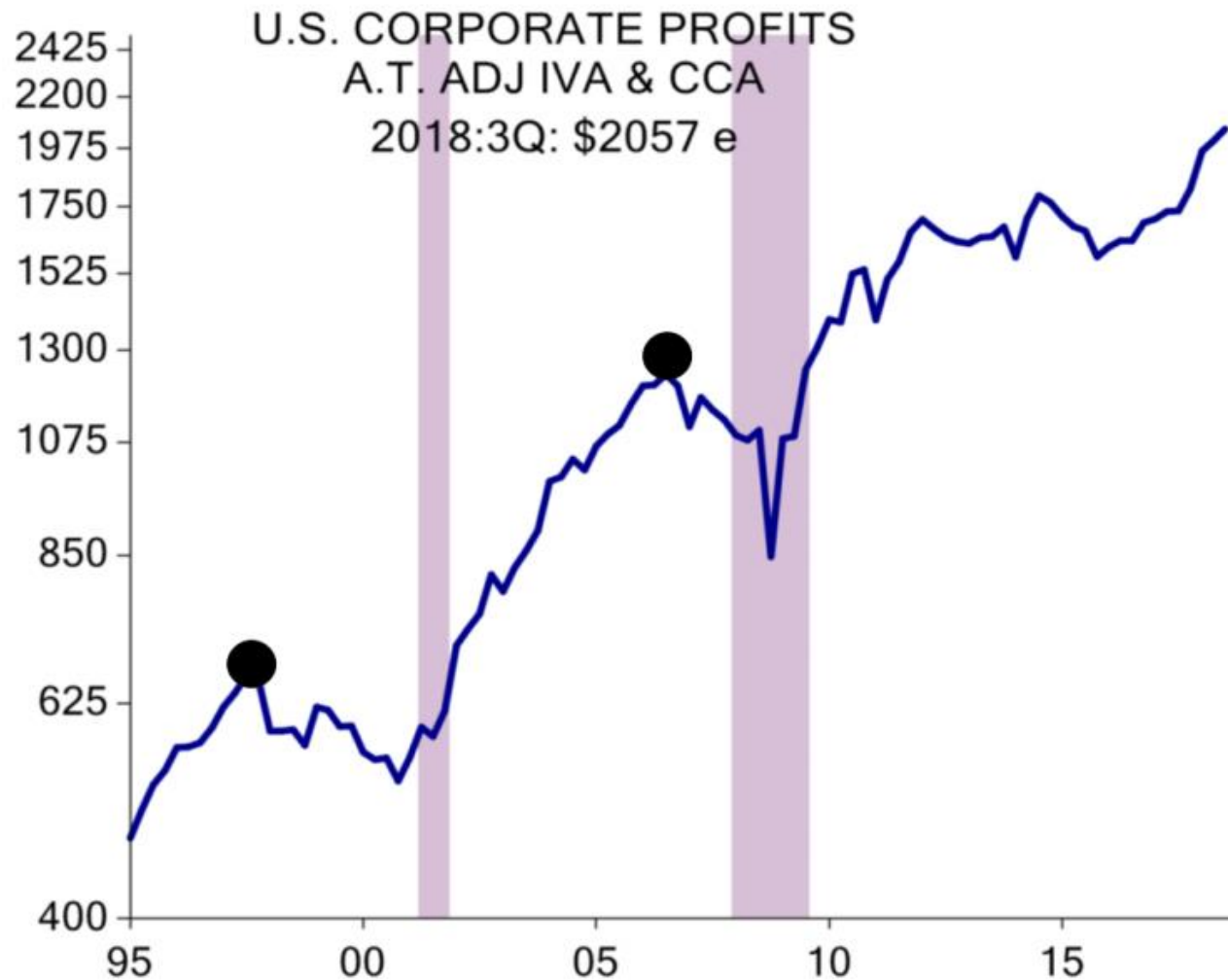
## Recession Dashboard

Start of Recession	Yield Curve	Inflation Trends	Labor Market	Credit Perform	ISM Mfg.	Earnings Quality	Housing Market
Nov-73	↓	↓	↓	↓	↓	--	↓
Jan-80	↓	↑	↑	↓	↓	--	↓
Jul-81	↓	↓	↓	↓	↓	↓	↓
Jul-90	↓	↓	↓	↓	↓	↓	↓
Mar-01	↓	↓	↓	↓	↓	↓	↔
Dec-07	↓	↓	↔	↓	↓	↓	↓
Present	↑	↔	↑	↑	↑	↑	↑

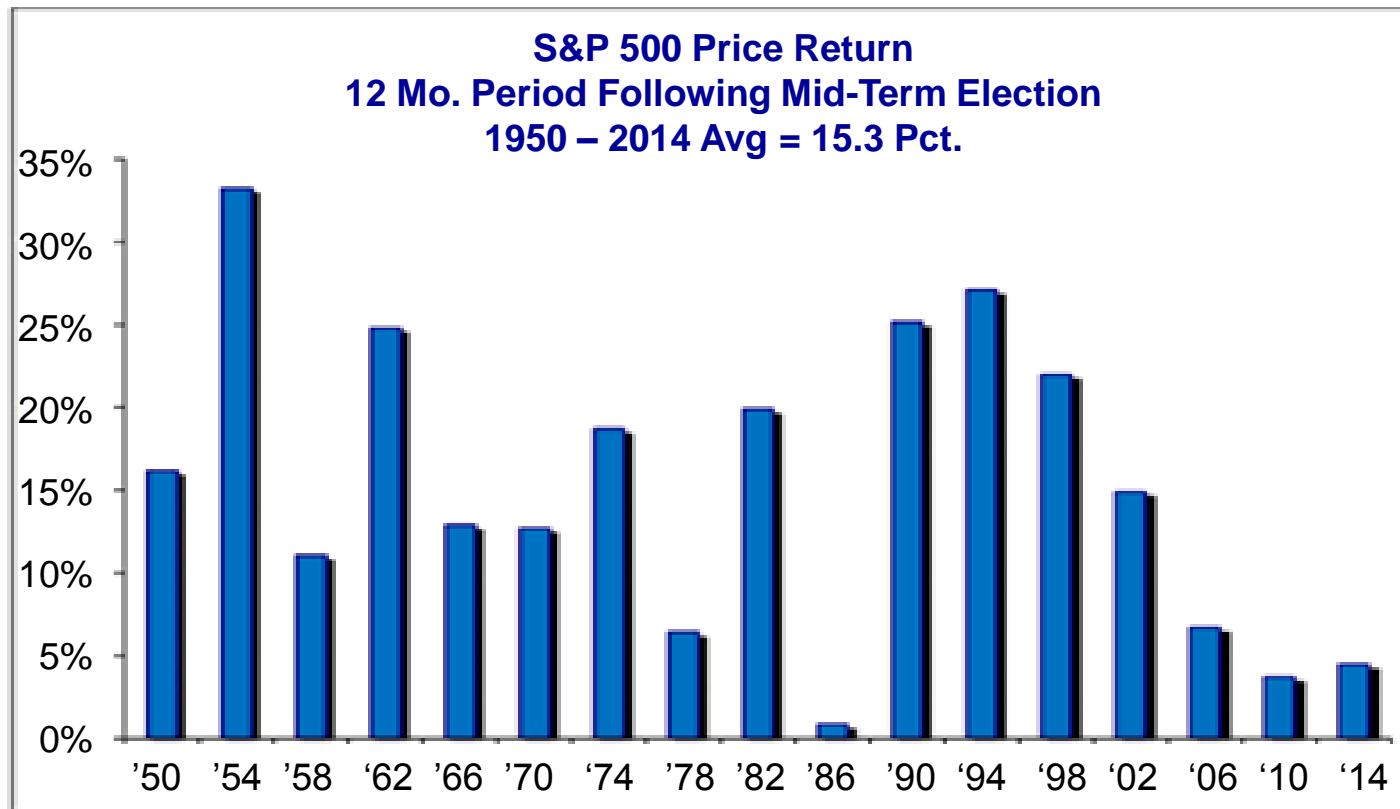
Key: ↓ Recessionary    ↑ Expansionary    ↔ Neutral

Source: Standard & Poor's, Federal Reserve, BLS, National Statistical Agencies, NBER, ISM, Census Bureau, Haver Analytics®, Credit Suisse

# CORPORATE PROFITS DO NOT INDICATE RECESSION



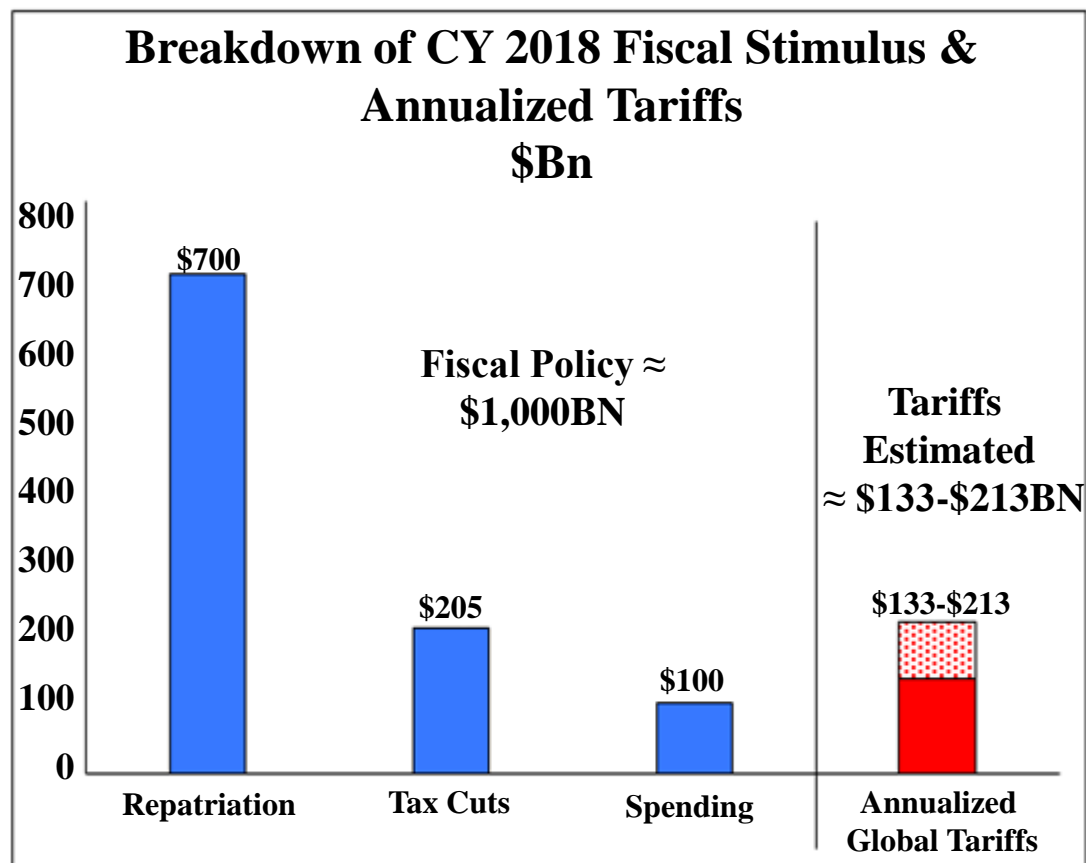
# MIDTERM ELECTIONS LEAD TO BETTER MARKETS



Source: Strategas

**Midterm elections have historically resulted in an average gain in the following 12 months of over 15%. Since 1950, the market has not declined in the 12 months following a mid-term election.**

# THE IMPACT OF TARIFFS IN CONTEXT

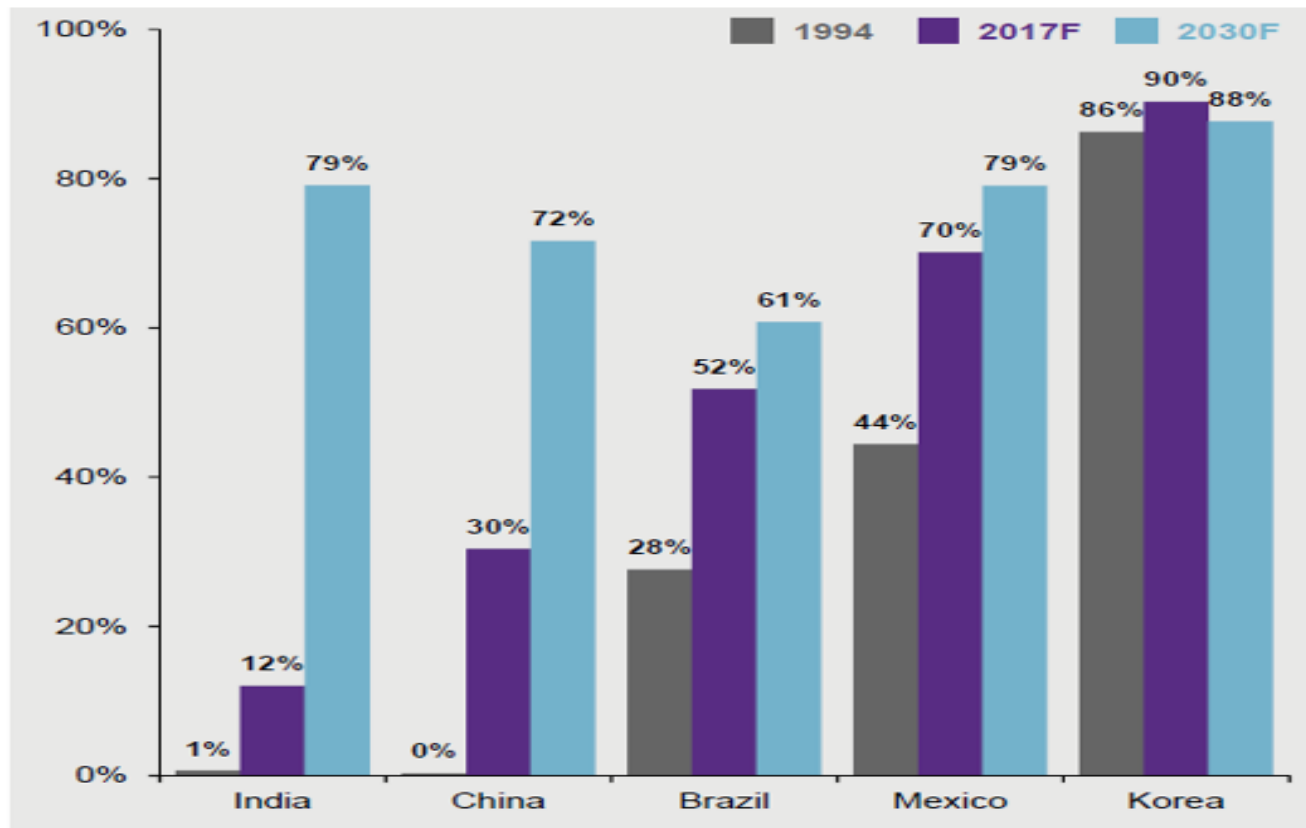


Tariffs have dominated the news lately, but their impact to the US economy is dwarfed by the size of the fiscal stimulus that is occurring.



# EMERGING MARKET MIDDLE CLASS REMAINS A GROWTH DRIVER

## Growth of the Middle Class % of total Population



Source: JP Morgan

# TECHNOLOGY MARCHES ON

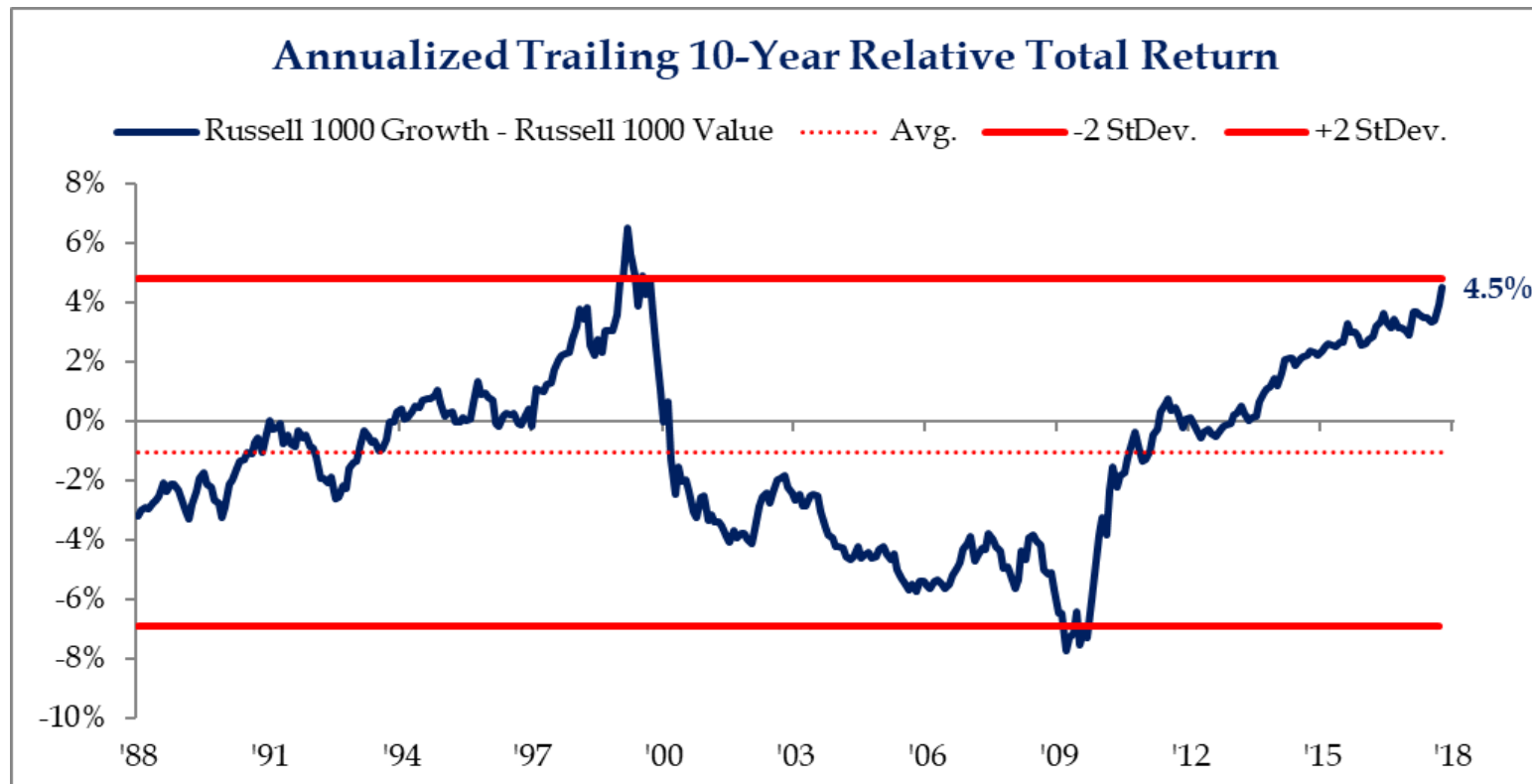


Samsung just introduced a phone that folds into a small tablet

# IT'S DÉJÀ VU ALL OVER AGAIN

## GROWTH VS. VALUE IS NEAR EXTREMES

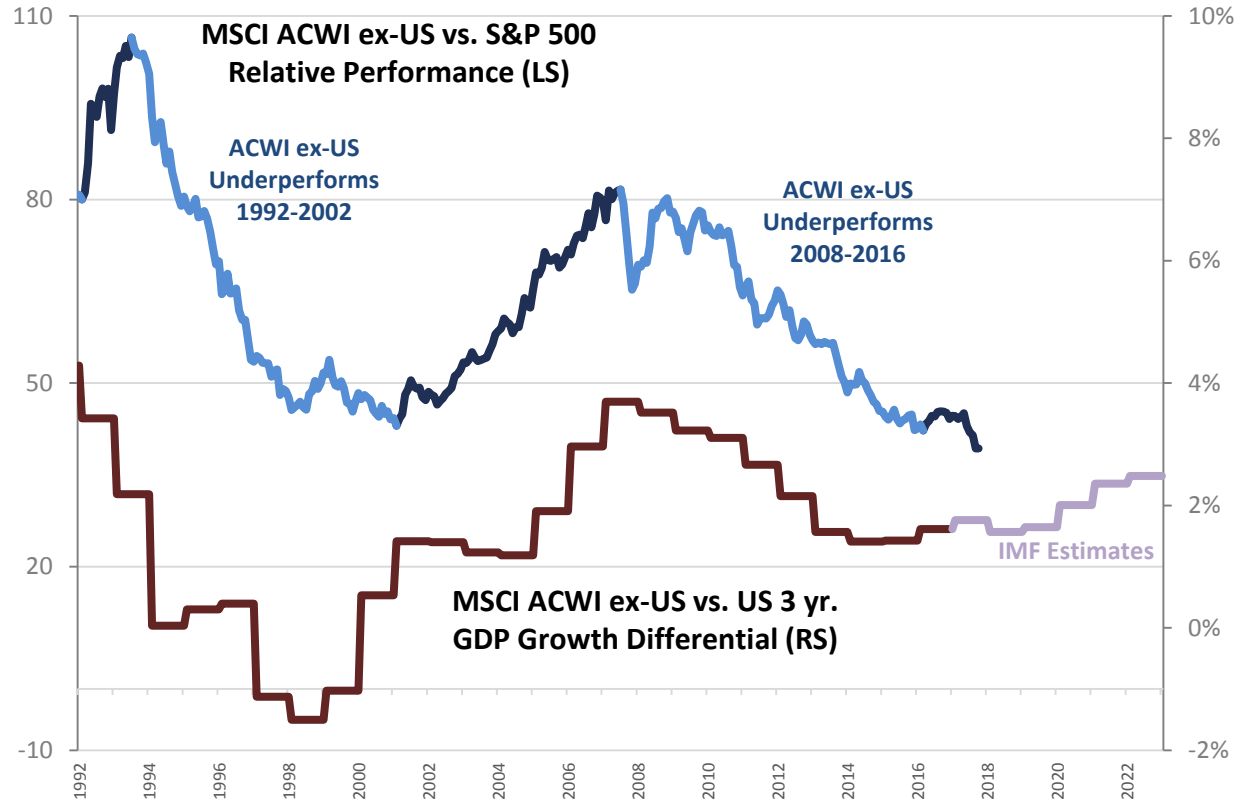
Data as of 10/11/2018



**Growth and Value predictably peak out when 10 year relative returns reach 2 standard deviations from the norm. Expect value to take the lead at some point.**

# TIME TO LEARN A FOREIGN LANGUAGE

## TODD'S CHART OF INTEREST: MAY 10, 2017



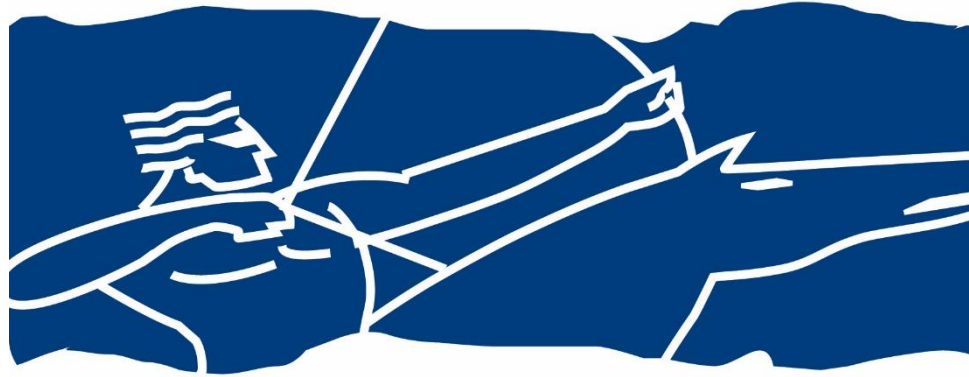
\* GDP is derived from IMF data and represents the difference in the 3 year annualized growth rate of GDP based on PPP between countries in the MSCI ACWI ex-US and the US.

Source: IMF, MSCI and Todd Asset Management as of 6/30/2018 (updated since initial publication).  
See performance disclosure for additional information on benchmarks presented.

- ◆ Economic growth has been a reliable determinant of relative index performance. Over the past 25 years, accelerating international GDP growth relative to the US has been accompanied by international stocks outperforming their counterparts, and visa-versa.
- ◆ Evidence of globally synchronized growth is starting to emerge and IMF expectations are for international growth the reaccelerate for the first time since 2008.
- ◆ Following roughly 9 years of underperformance, we think a secular resurgence of international growth and stock performance is probably beginning.

- **EM Consumption**
- **Technology Innovation/Adoption**
- **Returning to “Normal”**
- **Pent Up Demand Exists**
- **Shift from Monetary to Fiscal Stimulus**
- **Market Leadership Shifts**

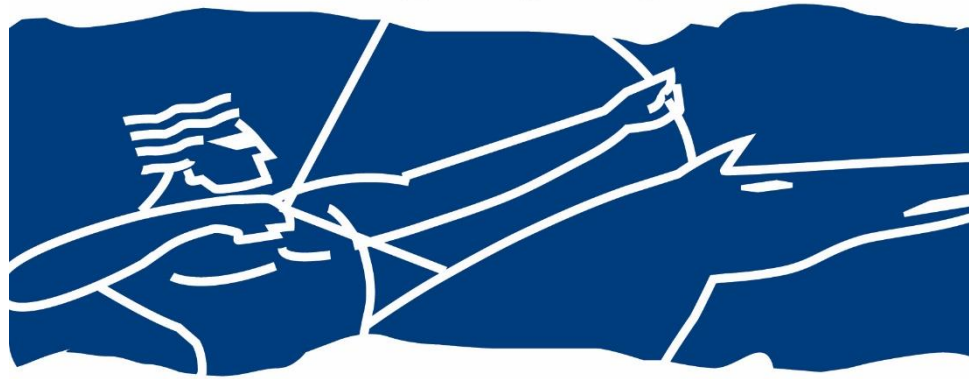
# TODD



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## Q & A

TODD



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