

Investment Education Workshop: Asset Class Overview: The Role of Fixed Income and Benchmarks

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Overview

- CalPERS Board Self-Evaluation Workstream: Board Curriculum
- Board delegation sets Investment Committee Responsibilities
- Partnership with CFA Institute and Council of Institutional Investors
- Role of Fixed Income and Benchmarks Workshop

The CalPERS Pension Buck

Why Investment Returns Matter



Investment Committee Responsibilities As Set by the Board's Delegation

Conduct:

- Strategic asset allocation
- Selection and performance of board consultants

Oversee:

- Investment performance
- Fund liquidity management
- Selection and performance of partners, managers, and consultants
- Cost effectiveness of investment program
- Investment Office risk assessment and control environment
- Environmental, Social, and Governance program
- Management of risks

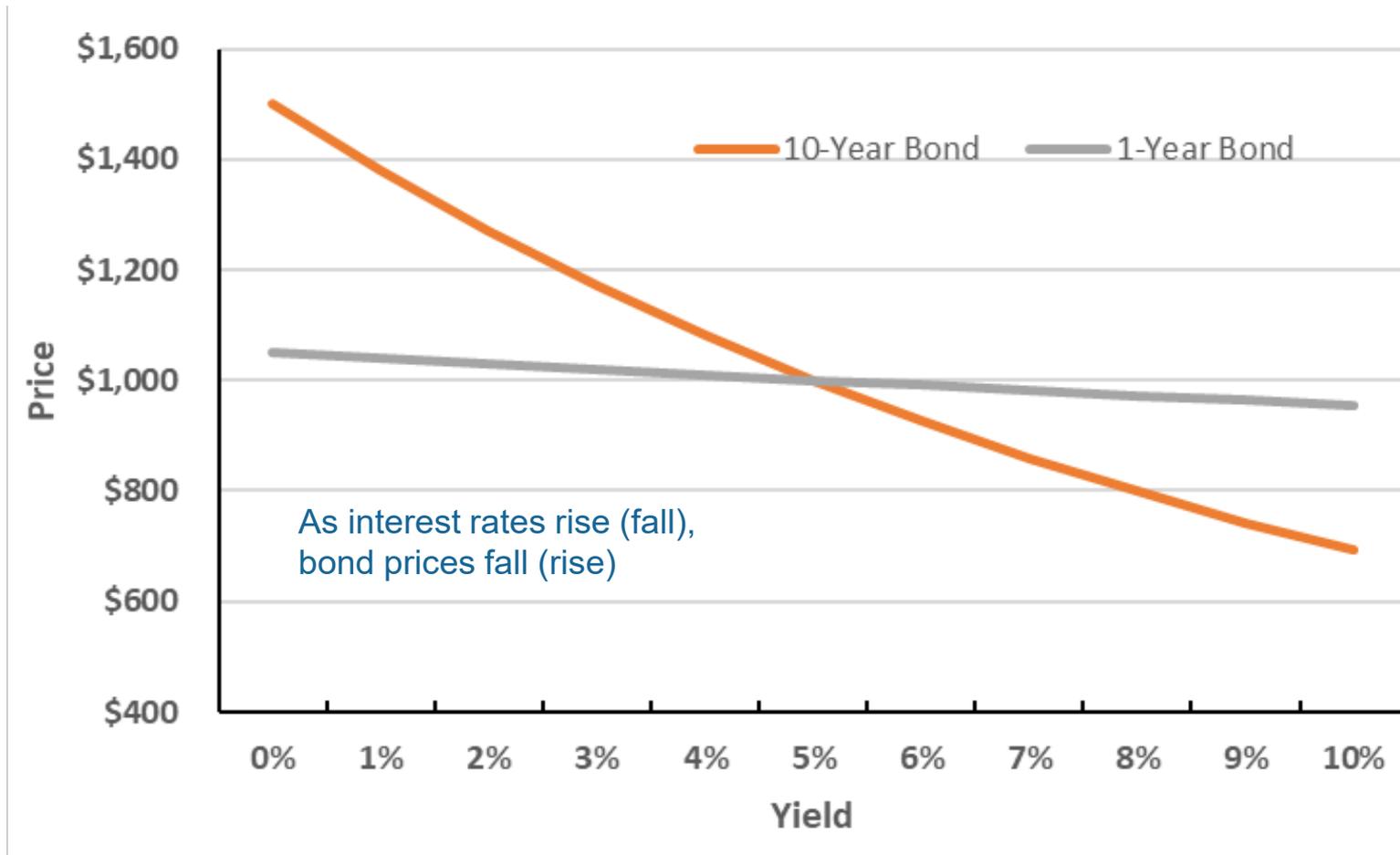
Bonds Are Not Boring!

- Fixed income securities (aka bonds) play a diverse set of roles in sponsors' portfolios
 - A fund's mission will drive its use of bonds
 - Large endowment funds tend to have very low allocations
 - Fully-funded closed corporate pension plans can be almost all bonds
 - Virtually all funds find them valuable for liquidity management
- Despite the security of payments, portfolios of high quality bonds can still experience considerable annual volatility
- High quality bonds are one of the few asset classes that offer dependable low correlations with equities
 - Bonds with varying levels of issuer quality can display a wide range of correlations with equities
- Risk budgeting strategies can combine bonds with other asset classes to create portfolios with attractive risk-return profiles

A Few Fixed Income Fundamental Concepts

1. Bonds represent an obligation of the issuer to make specified payments to the bond holder at specified times in the future
2. Some bonds make periodic interest (coupon) and principal payments while others make only one principal repayment (zero-coupon bonds)
3. Bond prices are inversely related to interest rates
4. The longer the maturity of the bond the more sensitive is its price to changes in interest rates
5. Bonds with longer maturities typically yield more than shorter-maturity bonds (upward sloping yield curve)
6. Lower-quality bonds yield more than higher quality bonds (credit spread)
7. Bonds are much more complex financial instruments than common stocks

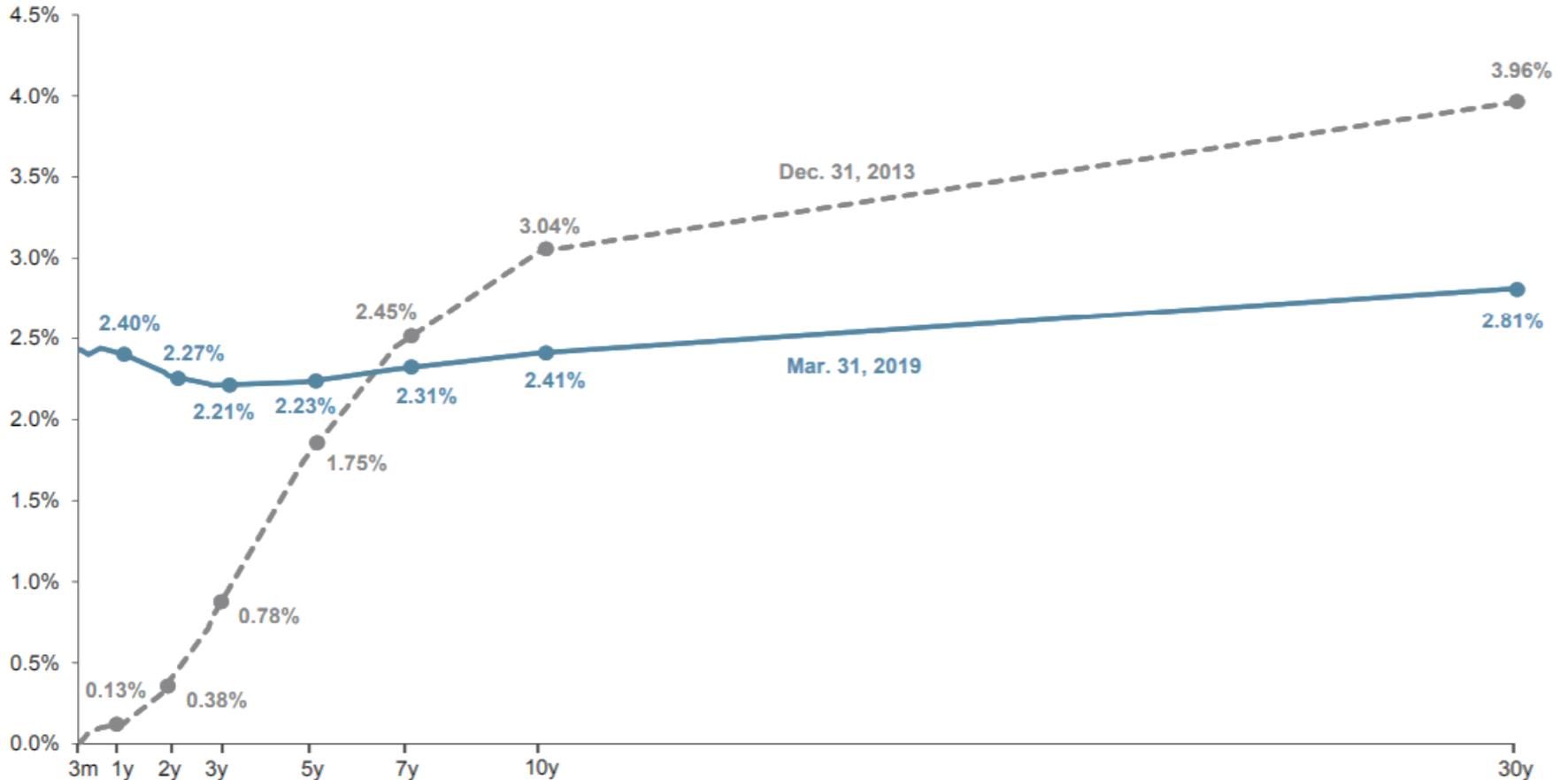
Bond Prices Are Inversely Related to Interest Rates



Typically the Yield Curve is Upward Sloping

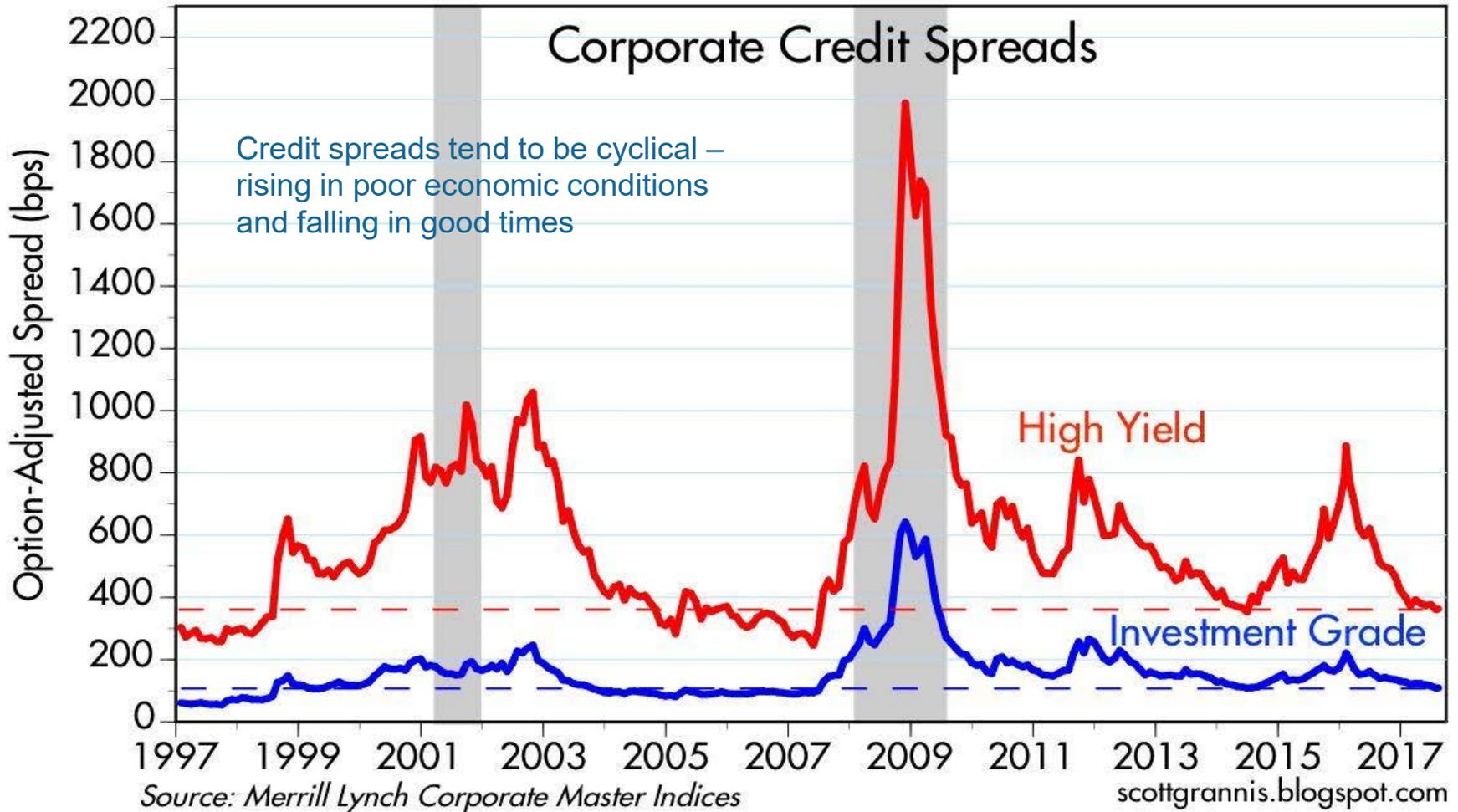
Yield curve

U.S. Treasury yield curve



Source: JP Morgan

Credit Spreads Respond to Economic Conditions



Some Common Types of Bonds

- U.S. Treasury
 - Nominal
 - Inflation-protected
- Government agency
- Municipals
- Corporate
 - Investment grade
 - High yield
- Mortgage Backed (MBS)
- Non-U.S.
 - Governments or corporates
 - Currency hedged or unhedged

- What is our approach to classifying our bond investments?
- What types of bonds fit best with our fund's mission?
- How is our fixed income allocation split between various categories of bonds?
- What types of constraints do we put on our bond investments?

Fixed Income Investing Risks

- Interest rate risk
- Credit risk
- Inflation risk
- Liquidity risk
- Reinvestment risk
- Yield curve risk
- Sector risk
- Call risk
- Exchange rate risk

- Which types of fixed income risks are most relevant to our investment program?
- How do we mitigate our prominent fixed income risks?
- Do we understand how different market environments influence our fixed income risks?

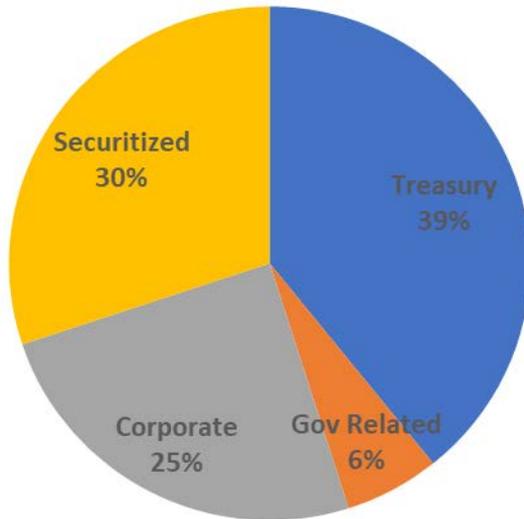
Fixed Income Benchmarks

- The properties of valid benchmarks should apply to fixed income as they do for any other asset class
 - Unambiguous
 - Measurable
 - Investable
 - Appropriate
 - Specified in advance
- Broad market indices can be sub-divided and recombined to create fixed income benchmarks

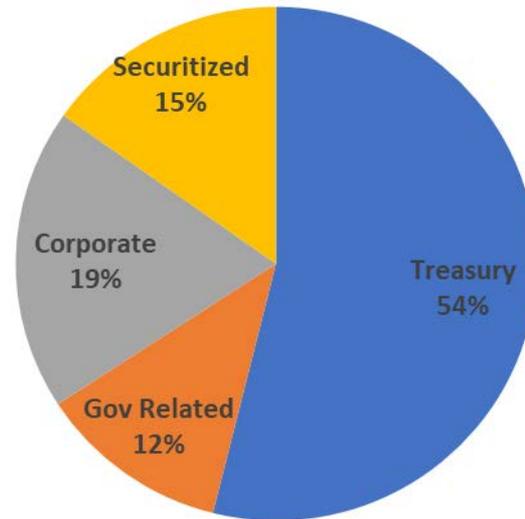
- What fixed income benchmarks are used in our investment program?
- Do our bond benchmarks satisfy the properties of valid benchmarks?
- What is the extent of “out-of-benchmark” holdings in our investment program?

Composition of Broad Bond Indexes

U.S. Aggregate



Global Aggregate



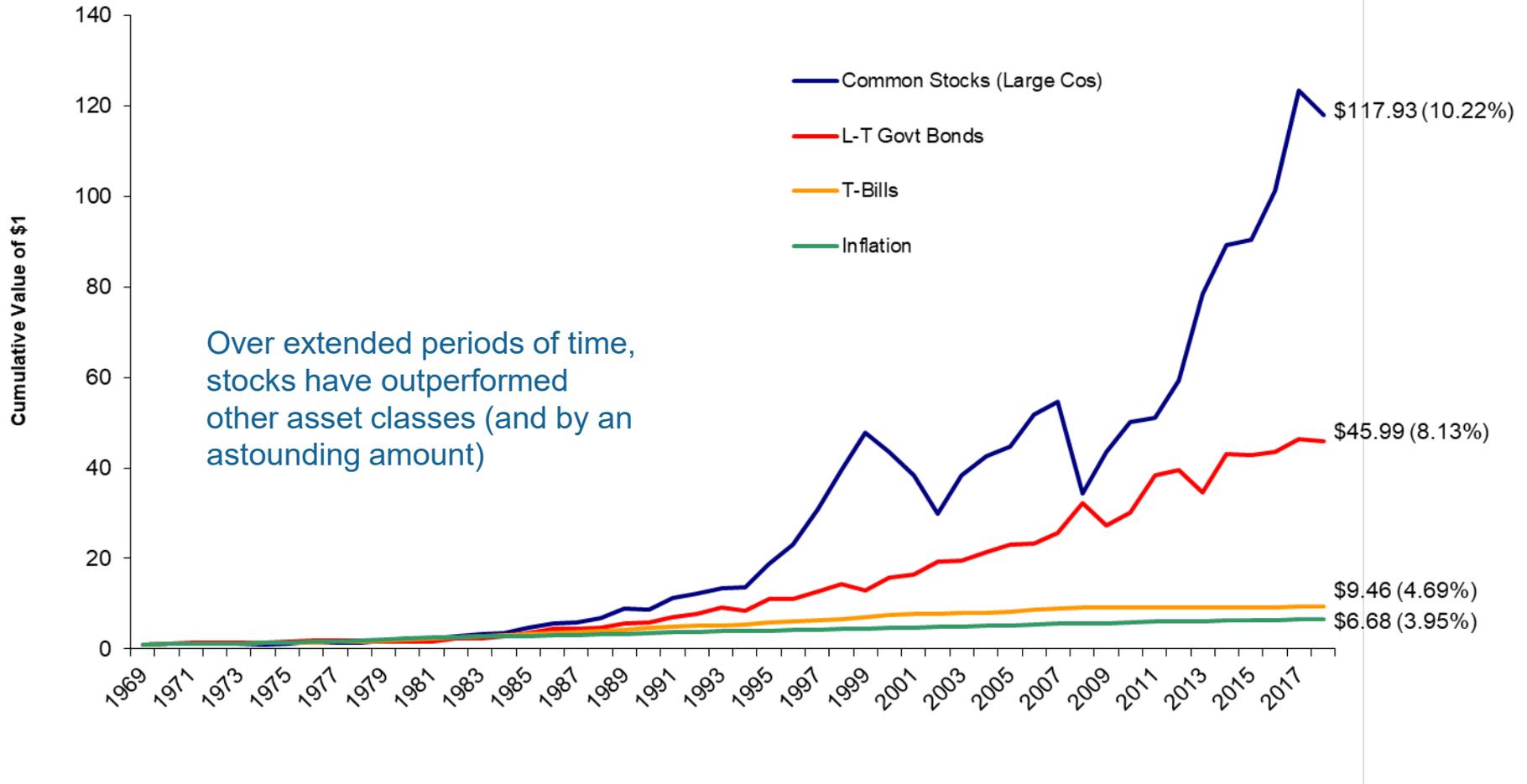
Passive management against a market index is more complicated for bonds than stocks

U.S.	41%
Europe	31%
Asia-Pacific	21%
Other	7%

Source: Bloomberg

The Standard Paradigm: Stocks Beat Bonds and Cash

U.S. Capital Markets



Why *Not* 100% Equities?

- Historical outperformance of stocks over bonds is dramatic
 - Historically, an all-equity portfolio produced far superior long-term wealth than a blended portfolio of stocks and bonds
 - So one has to wonder why sponsors with long-term horizons bother with fixed income at all?
- Why do we not see all-equity sponsor portfolios?
 - Do we see all-fixed income sponsor portfolios?
 - What are the characteristics of sponsors who have high FI allocations?
 - What are the characteristics of sponsors who have low FI allocations?

The Standard Case for Fixed Income

1. Dampener of portfolio volatility
2. Deflation hedge
3. Liquidity management
4. Advantageous risk-reward characteristics

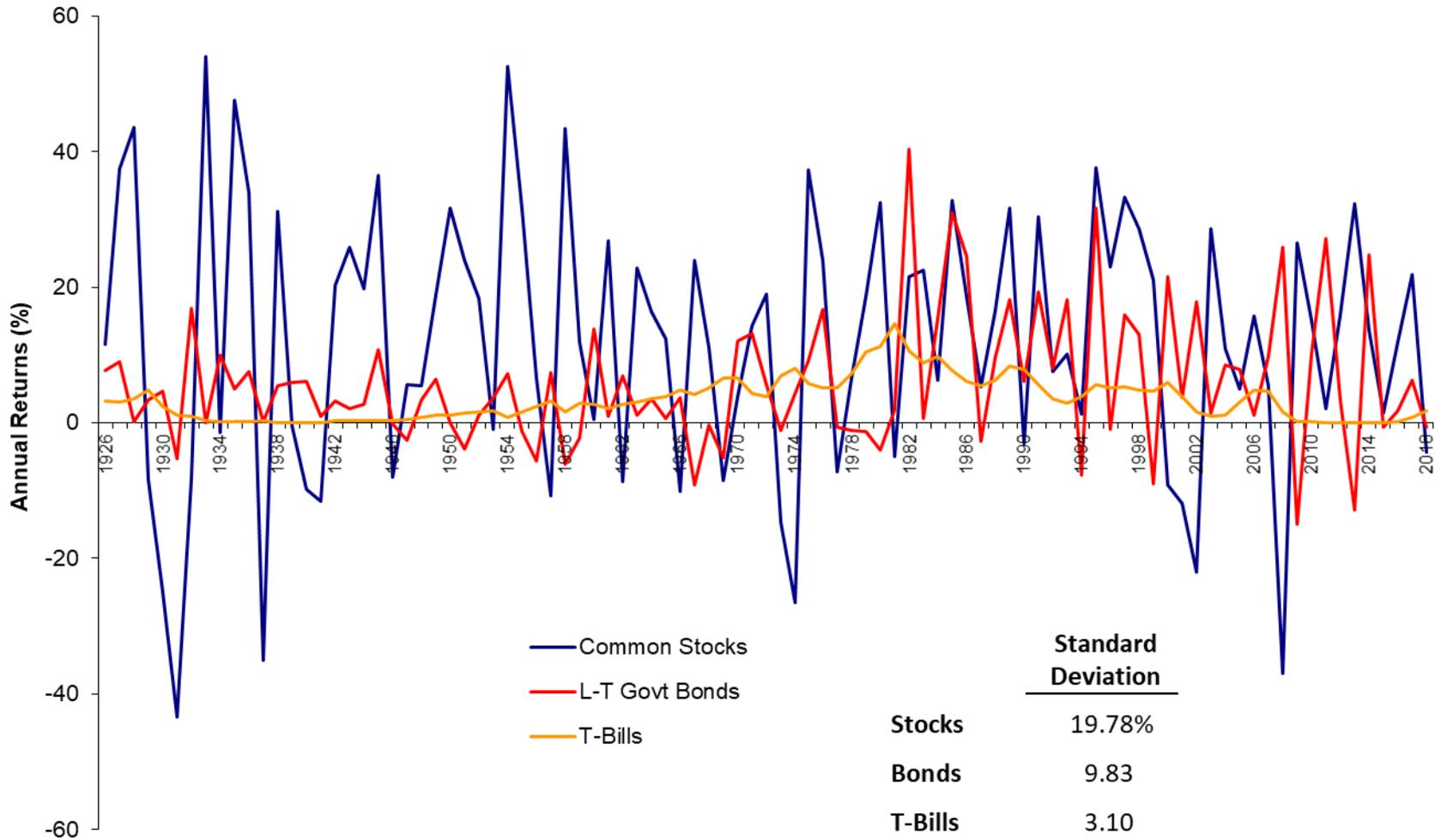
Let's agree at the start that we will focus on only low default probability fixed income – U.S. Treasury bonds or very high quality corporate bonds

Reason #1 – Volatility Dampener

- Equities experience huge volatility relative to fixed income
 - Few “long-term” investors can stomach that volatility
- Fixed income exhibits very low correlations with equities
- Net result is that fixed income is very effective at dampening portfolio volatility

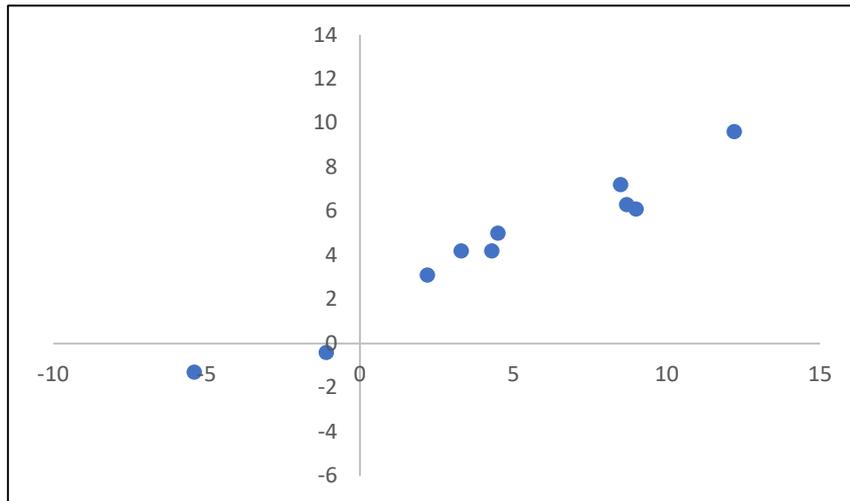
- Could the board stay the course with a nearly 100% equity allocation?
- Can't the low correlation benefits of FI be accessed through asset classes with higher expected returns?
- Shouldn't the decision about acceptable risk be separated from the asset allocation decision?

Equity and Fixed Income Annual Returns



Positive and Negative Correlations

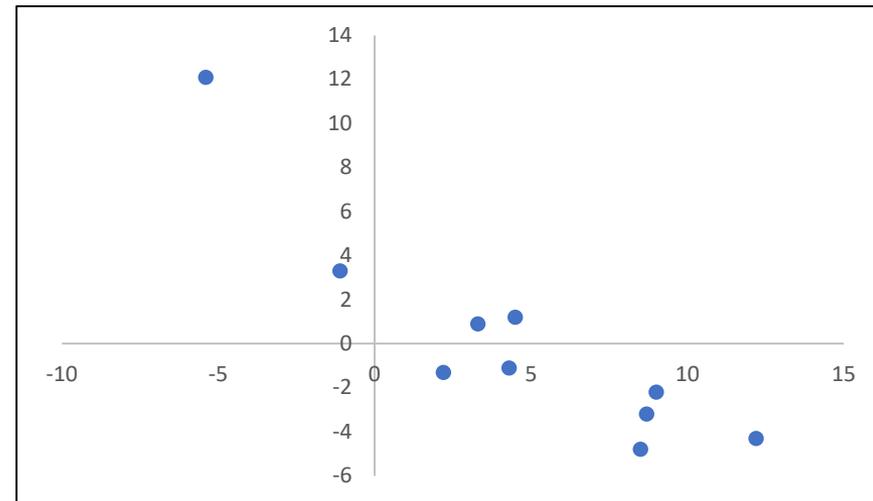
ROR_A vs ROR_B



Examples

- Stock market returns and economic growth
- Compound yield and total wealth

ROR_A vs ROR_C



Examples

- Bond yields and bond prices
- Gas prices and world oil production

Correlations fall between -1.0 and +1.0

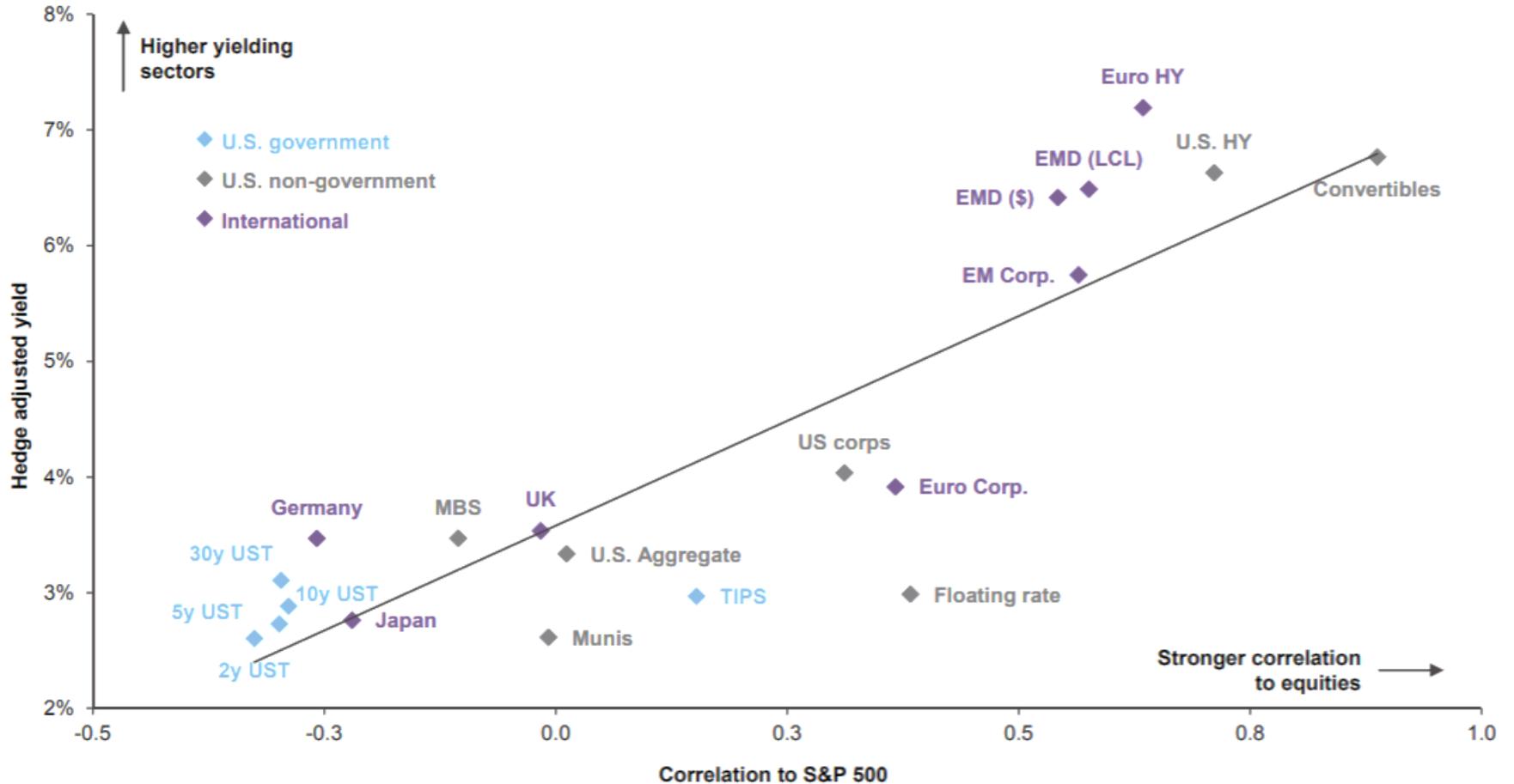
U.S. Capital Markets Returns Correlation Matrix 1926 – 2018 (Annual Returns)

	Large Co. Stocks	L-T Government Bonds	T-Bills	Inflation
Large Co Stocks	+1.00			
L-T Government Bonds	+0.01	+1.00		
T-Bills	-0.02	+0.18	+1.00	
Inflation	0.00	-0.13	+0.41	+1.00

Data Source: Ibbotson Associates

Different Bond Types and Correlations with U.S. Stocks

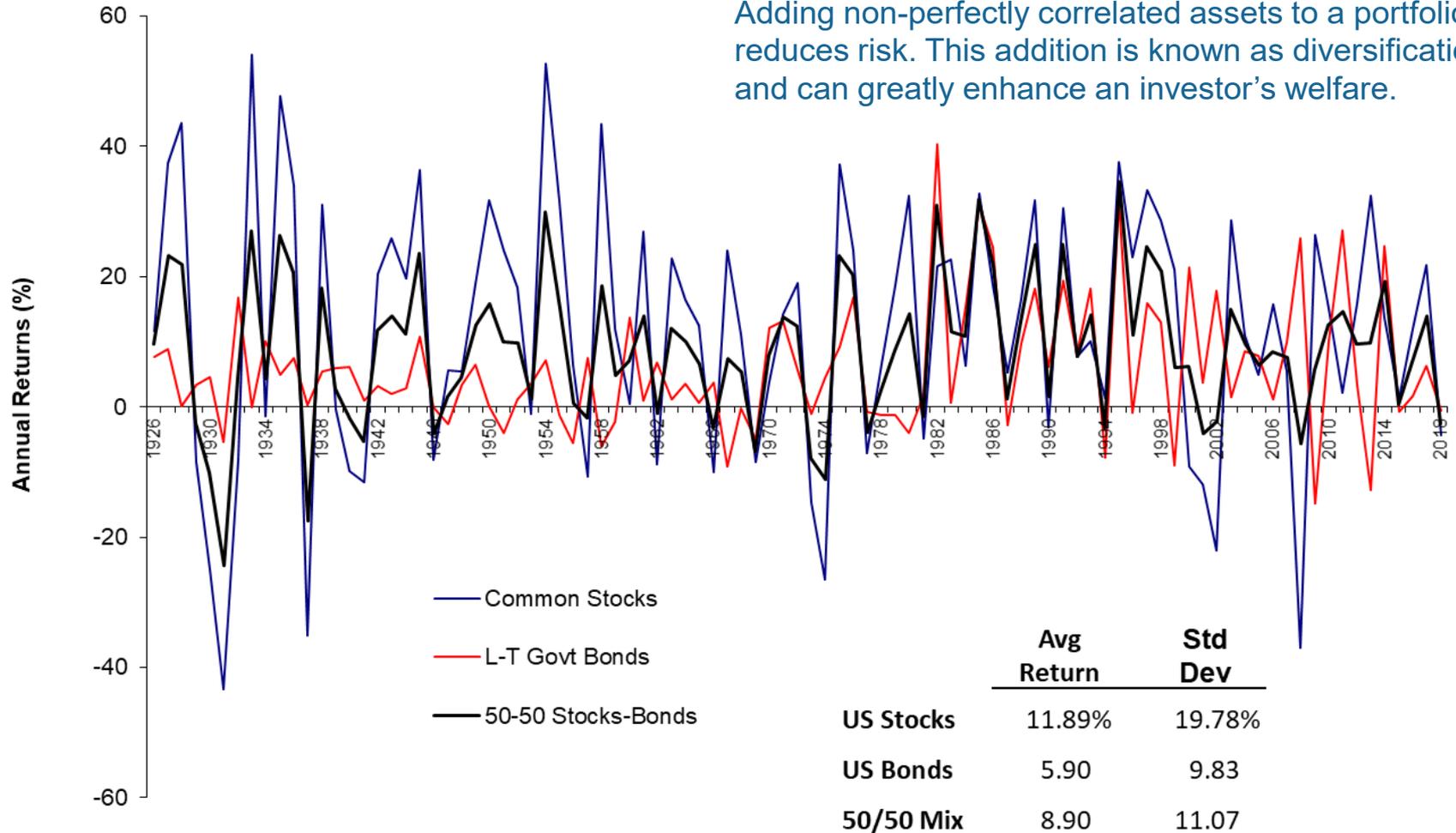
Correlation of fixed income sectors vs. S&P 500 and yields



Source: JP Morgan

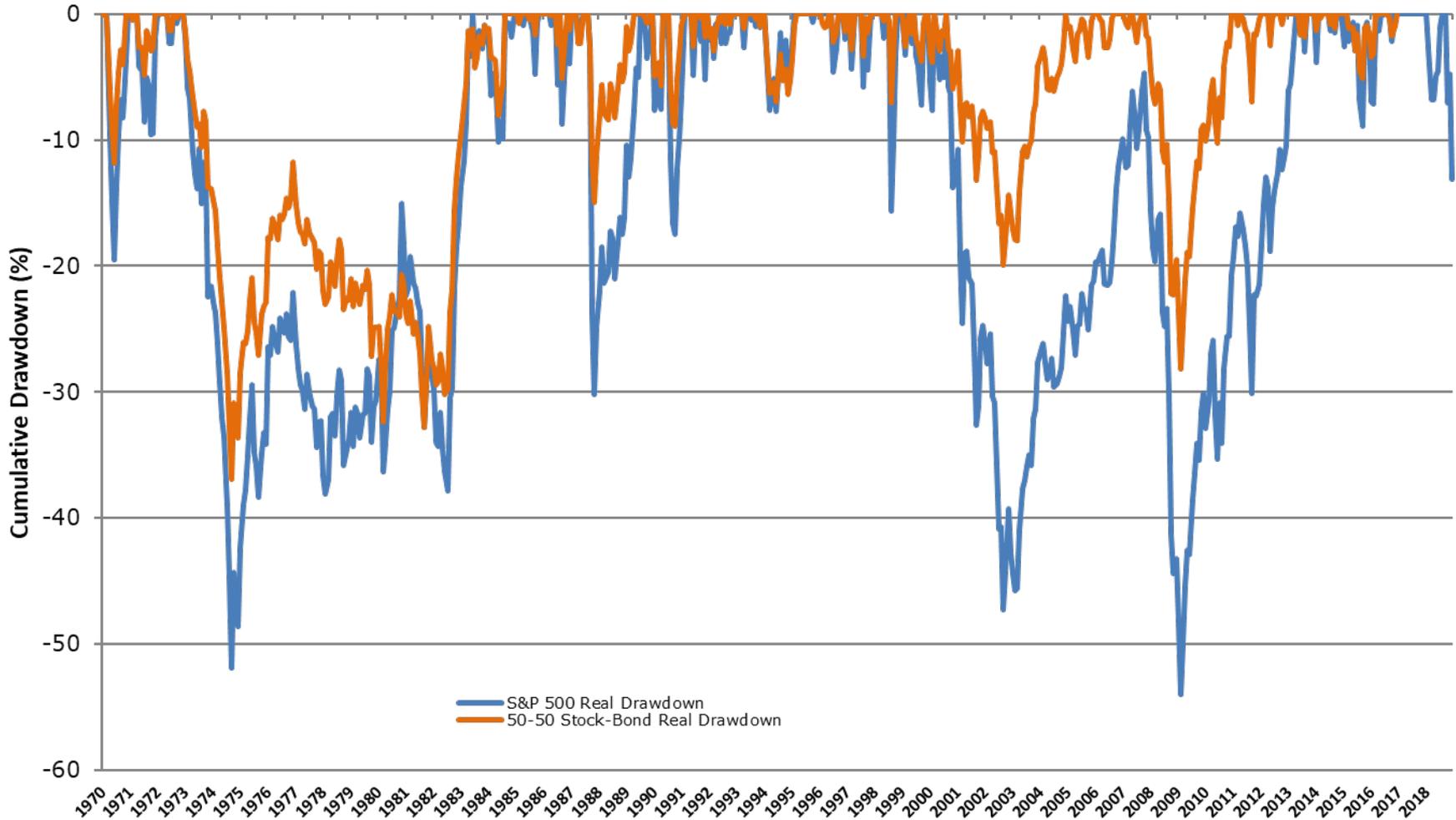
Effects of Simple Diversification

Adding non-perfectly correlated assets to a portfolio reduces risk. This addition is known as diversification and can greatly enhance an investor's welfare.



Data Source: Ibbotson Associates

Diversification Reduces Real Return Drawdowns



Data Source: Ibbotson Associates

*SBI from 1970 - 1976; Barclays Agg from 1976 - 2018

Stock-Bond Correlations Do Change Over Time



Data Source: Ibbotson Associates

Reason #2 – Deflation Hedge

- The U.S. has little history with deflation (fortunately)
 - In negative inflation months (deflation), fixed income appears to do well
 - Evidence in the Great Depression shows fixed income considerably outperforming equities on a real basis
 - May be expensive insurance, but hard to argue it doesn't work
- Does deflation seem like a possibility in an age of digital money?
 - Is serious deflation like nuclear war? If it happens, won't I have other things to worry about than my portfolio?
 - Are there better ways to insure against deflation than holding FI?

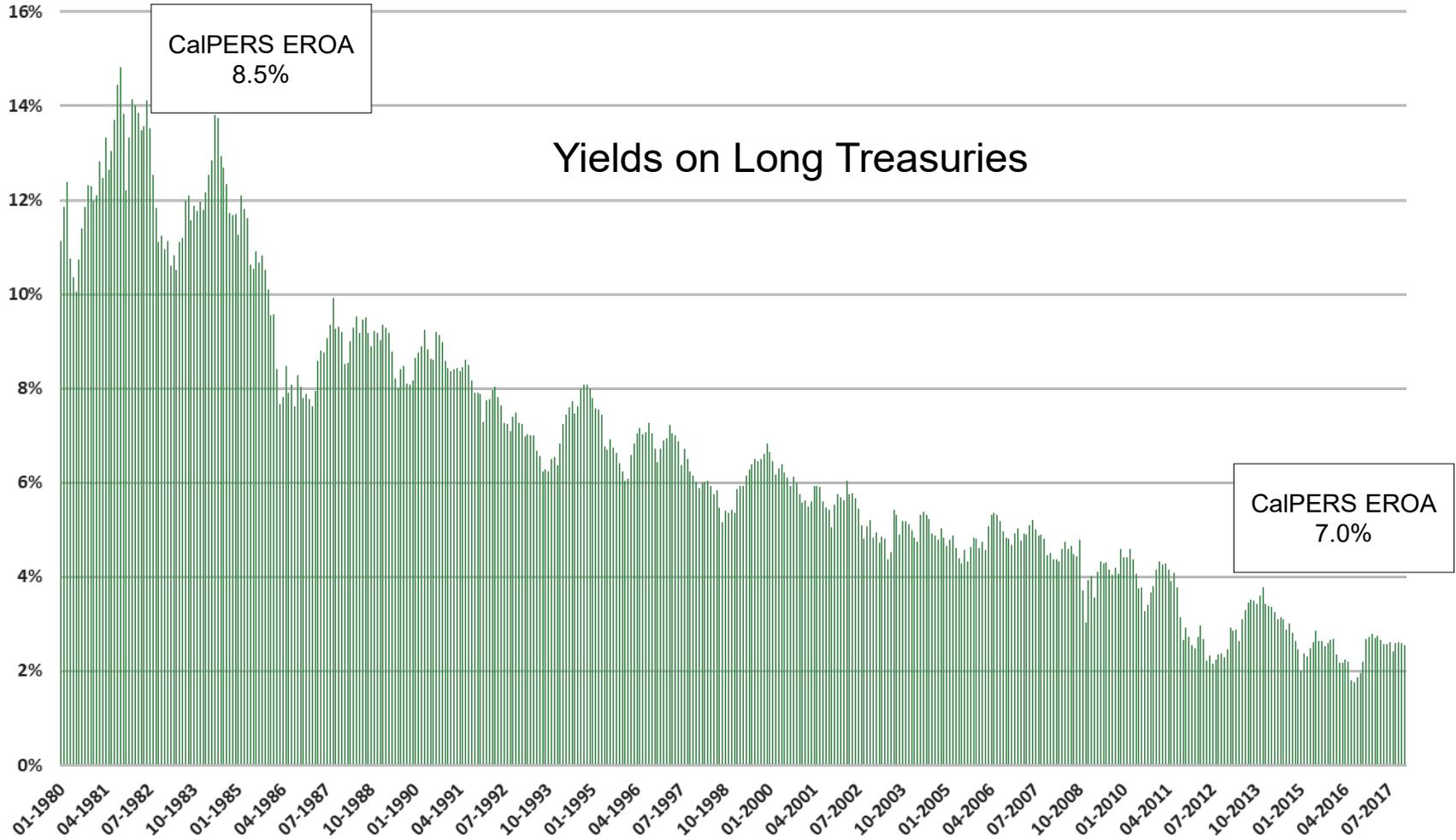
Reason #3 – Liquidity Management

- High quality fixed income (especially Treasuries) can readily be bought and sold at minimal cost
 - As a result, many funds hold a buffer of fixed income assets as a low cost way to manage liquidity
 - Uses of bonds for liquidity management include:
 1. Sell to fund other asset classes when rebalancing during equity market drawdowns
 2. Meet margin calls on derivative positions
 3. An income-producing source of dry powder awaiting deployment in other asset classes
 4. Fund benefit payments
- What are our normal liquidity needs?
 - Do we have a sense for potential liquidity demands in an equity market meltdown?
 - Have we ever experienced situations where we had to sell equity assets to meet near-term cash flow needs?
 - How much liquidity “insurance” do we need?

Reason #4 – Attractive Risk-Reward Characteristics

- More nuanced view of fixed income
 - Argument is that a portfolio of stocks and bonds has a better reward-risk profile than a portfolio of either alone
 - That idea can be used to create more “efficient” portfolios with targeted volatility levels
 - Contain large allocations to FI
 - Risk parity is based on this concept
 - Separating the risk decision from the asset allocation decision
- How concerned are we with our large exposure to equity risk?
 - If we made greater use of bonds in our policy asset mix, how would we achieve our desired risk and return targets?
 - Are we willing to separate the risk decision from the asset allocation decision?

Then and Now



Data Source: Ibbotson Associates

FI Compatibility with a 7.0% Discount Rate

- Fundamental Law of Pension Finance

Benefits = Contributions + Investment Earnings

- The higher the investment earnings, the lower the contributions
- With the decline in interest rates, fixed income has a harder time carrying its weight in a largely unchanged EROA
- In response, public funds have lowered their FI allocations and increased equities and alternatives
 - Result is higher portfolio risk
 - Is the EROA tail wagging the asset allocation dog?

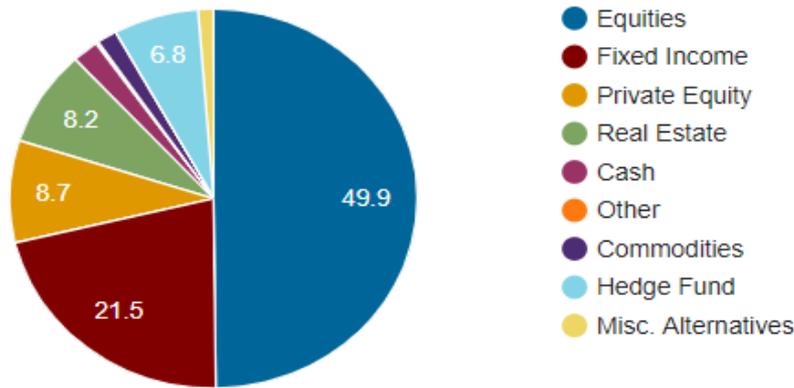
Let's Do the Math

	Expected Return	Policy Allocation
Global Equity	8.1%	50%
Private Equity	11.3	8
Fixed Income	3.2	28
Real Assets	6.5	13
Liquidity	1.0	1
Arithmetic Average	6.7%	100%
Volatility Penalty	0.6	
Compound Return	6.1%	

Source of Expected Returns: CalPERS

Public Funds' Fixed Income Allocations

Asset Allocation for State and Local Pensions, 2017



Source: Public Plans Database

National data averages are weighted by plan size.

ASSET ALLOCATION, 2017

	Percent
Equities	49.9
Fixed Income	21.5
Private Equity	8.7
Real Estate	8.2
Cash	2.1
Other	0.2
Commodities	1.6
Hedge Fund	6.8
Misc. Alternatives	1.2

Source: Public Plans Database

Conclusion

- Simple answer is fixed income is difficult to square with a 7.0% discount rate
 - Something has to give
 - Public funds have responded by moving into higher risk assets
 - Note: Taking higher risk does not guarantee higher returns
 - Conversely, taking lower risk almost always guarantees lower returns
 - It is one thing to set a return target, it is another to earn it
- How do trustees compensate for the relatively low yields on Treasury bonds in order to keep up the EROA?
 - Do trustees question the assumptions of consultants in building to a targeted EROA?
 - Are trustees comfortable with the increase in risk taken on in search of higher expected returns?

Final Comments and Conclusions