Board Education Workshop: Investment Risk and Return Basics

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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
- Investment Risk and Return Basics Workshop

The CalPERS Pension Buck

Why Investment Returns Matter

Investment Committee Responsibilities

As Set by the Board's Delegation

Set:

- Investment beliefs
- Total fund and asset class policy benchmarks
- Investment risk appetite
- Criteria and triggers for information and metrics reported

Approve:

- Investment policies
- Asset class strategic plans and portfolio guidelines
- Initiation or settlement of litigation involving material sums

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

CalPERS Board Education Workshop: **Investment Risk and Return Basics**

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Topics for Today

- A Primer for Investment Trustees
- Asset Classes, Investment Strategies and Benchmarks
- Investment Returns
- Investment Risk
- Managing Risk
- Active/Passive Management

A Primer for Investment Trustees: Understanding Investment Committee Responsibilities

- In the form of a conversation with a new trustee
- This trustee serves an investment committee responsible for DB and DC retirement plans and an endowment fund
- Non-technical discussion
- Covers important aspects of a trustee's role
- Chapter "Takeaways"
- Appropriate questions for a trustee to ask
- Glossary of terms
- Sample governance and investment policy statements

The Primer's Intended Audience - Investment Trustees

Who is an investment trustee?

- Any person serving on a governing body charged with high-level supervision of investment assets
- Does not have day-to-day responsibility for managing assets
- Focuses on providing direction to the fund
  - Hiring and evaluating top staff leadership and/or outside advisors
  - Setting investment policy
  - Monitoring performance relative to objectives
- Does not necessarily need extensive investment experience to do the job well

Genesis of the Primer

Trustees are an important, yet underserved, segment of the investment community

- From an educational perspective, most get little attention and little training
- Many trustees are selected for reasons other than investment knowledge

The body of educational literature available to trustees is very limited

- Most available readings are related to fiduciary issues
- Missing is a practical discussion of the role of the fund sponsor and how people can effectively act in that role

The Primer was written to help fill that gap

Nine Key Topics Addressed

1. Governance structure
2. Investment policy
3. Fund's mission
4. Investment objectives
5. Investment risk tolerance
6. Investment assets
7. Defined-contribution plans
8. Performance evaluation
9. Ethics in investing

Asset Classes

Publicly-Traded

- Public Equities
  - U.S.
  - Global or Non-U.S.
    - Developed/Emerging
  - Style (factor) exposures
- Public Fixed Income
  - Short, intermediate, long-duration
    - U.S. gov’ts, corps, mortgages
    - High yield
  - Global or Non-U.S
    - Currency hedged/unhedged

Private Markets

- Real Assets
  - Real estate
  - Commodities/Timber
  - Infrastructure
- Financial Assets
  - Venture capital
  - LBOs
  - Distressed debt
  - Mezzanine debt
  - Direct lending

Reflection:

- Why do we categorize our investment opportunities as we do?
- What roles does each asset play in our investment program?
- What has been the evolution of our non-U.S. and alternative investments?
- How do we acquire the expertise to evaluate, invest in and monitor new asset classes?

Private Markets

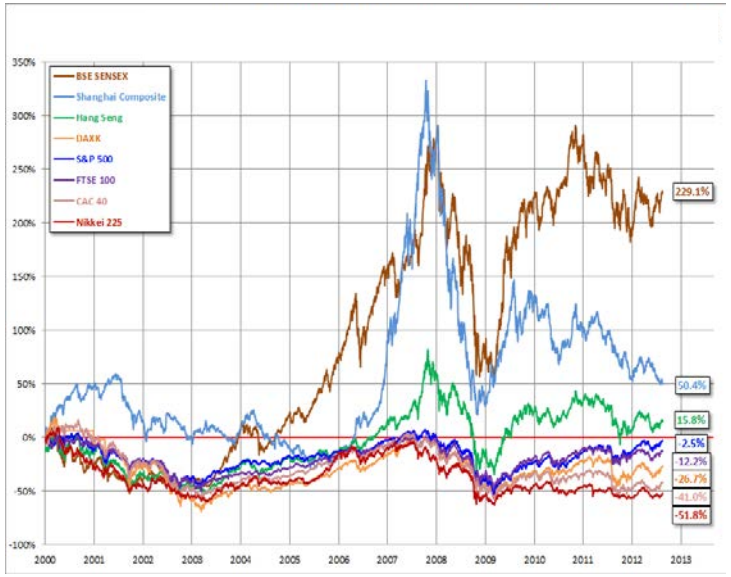
- Excluding hedge funds, private investments involve ownership of generally less liquid asset classes
  - A broad category that covers a wide range of asset types
  - The underlying assets usually are not publicly traded and investors often expect a premium for illiquidity
  - Investors believe that the assets are less efficiently priced and not highly correlated with stocks/bonds
- Many forms of private investments are accessed through limited partnerships (LP)
  - Capital commitments are made for a specified investment period
  - Capital calls/distributions at discretion of the general partner (GP)
  - Valuations largely appraisal-based
  - High fees and carried interest

Reflection:

- What do we think we gain from employing alternative investments?
- What are the strategic rationales for the various types of alternatives?
- What level of illiquid investments is appropriate for the fund?
- What performance expectations (returns and risks) have we set for each type of alternative investment?
- How do we benchmark our alternative investments?

Market Indexes

- A market index is a basket of securities designed to represent the performance of an asset class (or sub-class)
- Three key questions in constructing a market index
  - Purpose
    - What is the index to be used for?
  - Security selection
    - Limited inclusion: DJIA
    - Broad inclusion: Wilshire 5000
  - Security weighting
    - Value (capitalization): based on market values
    - Price: based on security prices
    - Equal: all securities get the same weight
    - Fundamentals: based on business metrics (e.g., revenues, earnings, dividends)
- Some uses of market indexes
    - Market environment
    - Performance benchmarks
    - Passive management strategies



Investment Benchmarks

- A benchmark is a passive representation of an investment process
  - Reflects the persistent and prominent characteristics of the process in the absence of active management
  - The “fishing hole” of the process
- Functions of investment benchmarks
  - Performance evaluation
  - Policy asset allocation
  - Risk control
  - Performance fee calculations
- Benchmarks are used at three levels
  - Individual managers
  - Asset classes
  - Total fund

Reflection:

- What benchmarks does our investment program use?
- What role do benchmarks play in our investment program?
- Are all segments of our program assigned benchmarks?
- How do we select benchmarks at the various program levels?
- How do we evaluate the quality of our benchmarks?

Characteristics of a Valid Benchmark

Unambiguous

- Benchmark's composition is clearly specified

Investable

- Investor could choose to own the benchmark

Measurable

- Benchmark's return easily calculated

Appropriate

- Benchmark displays similar risk

Specified in advance

- Benchmark's composition is identified prior to the evaluation period

Examples of Common Benchmark Types
How do they rate?

Absolute
- T-bills + 3%

Manager universes
- All domestic equity managers

Broad market indexes
- S&P 500

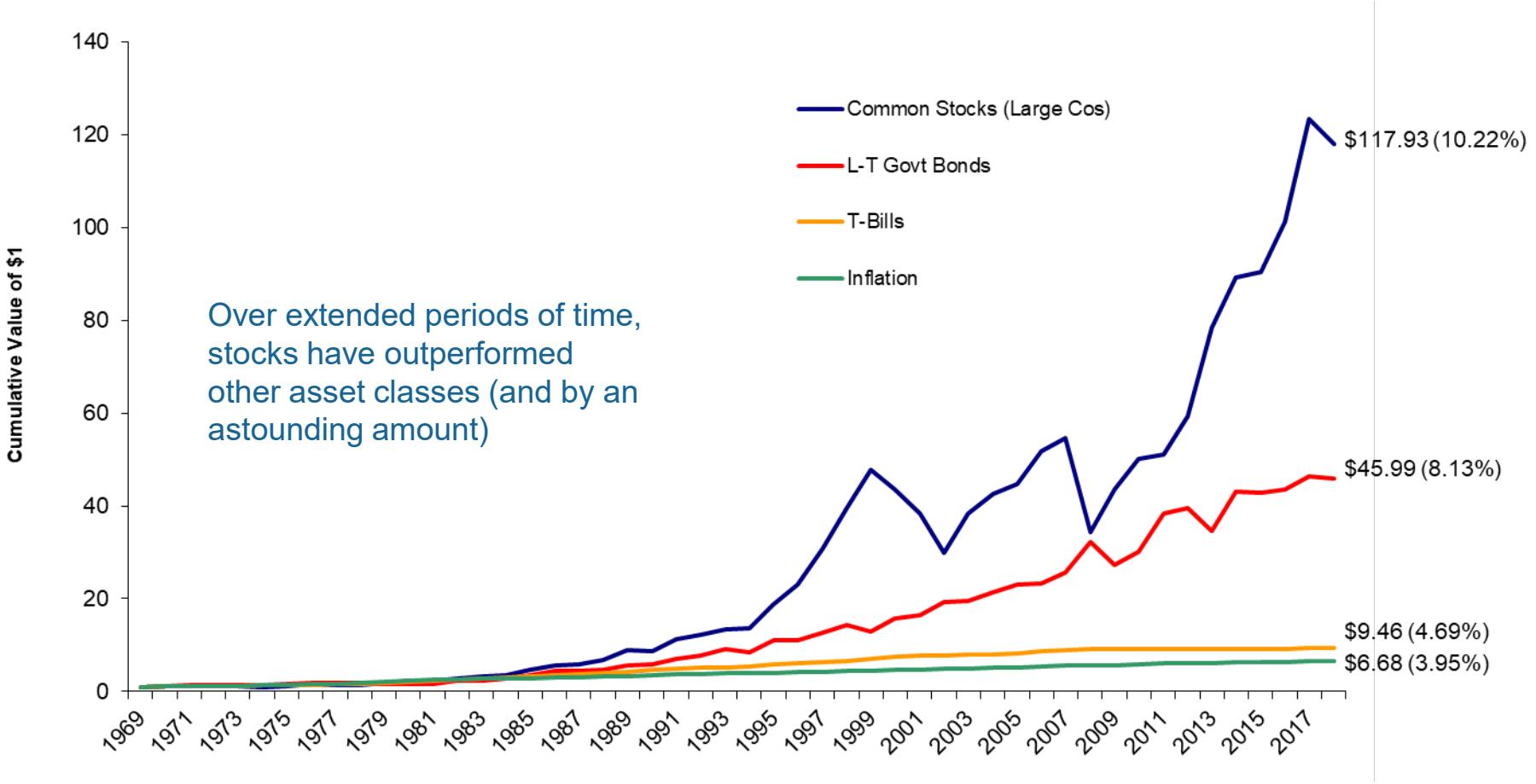
Style indexes
- Russell 1000 Growth

Returns based
- Combinations of style indexes

Custom security based
- Collection securities manager selects from

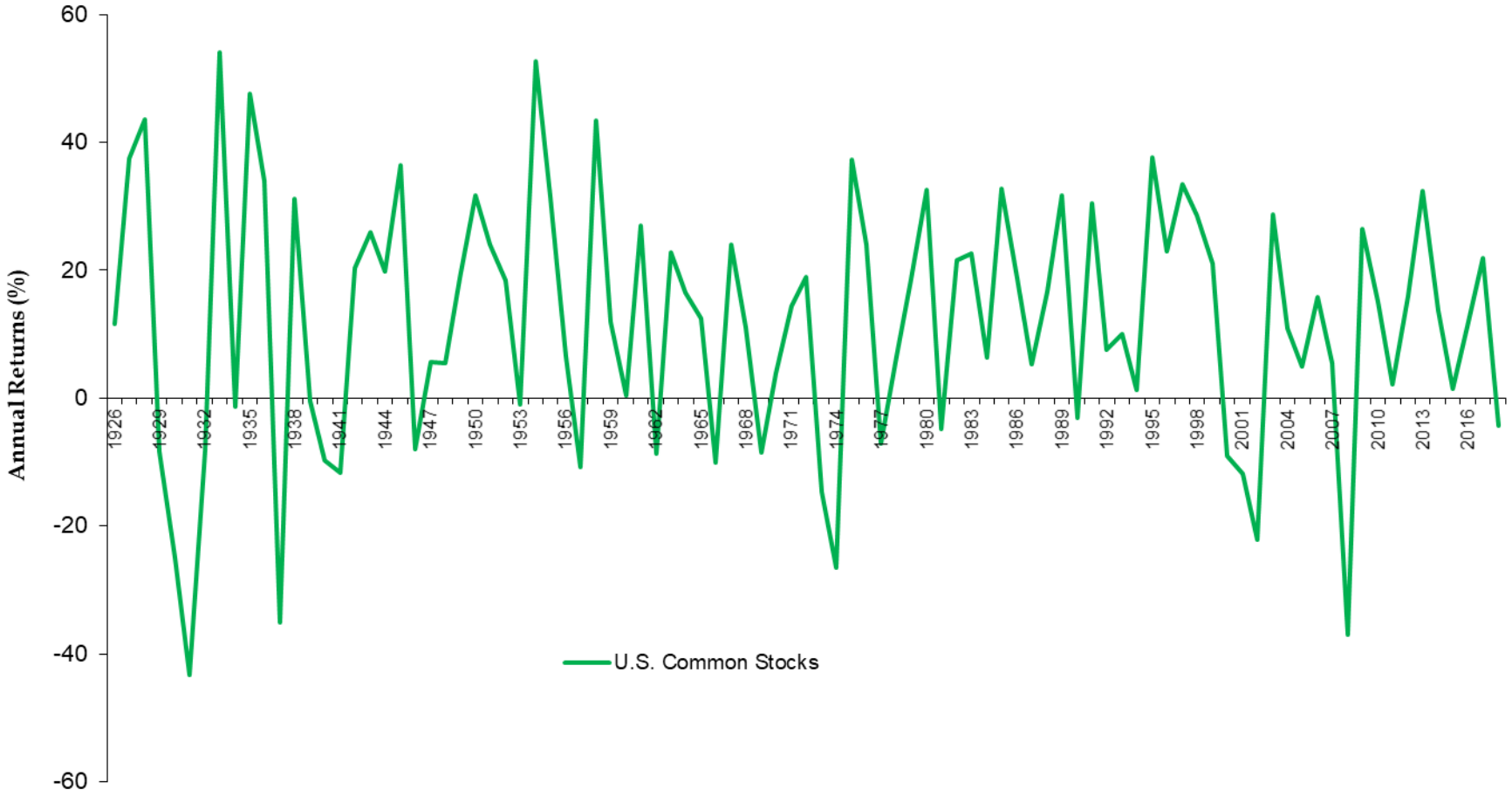
The Standard Paradigm: Stocks Beat Bonds and Cash

US Capital Markets



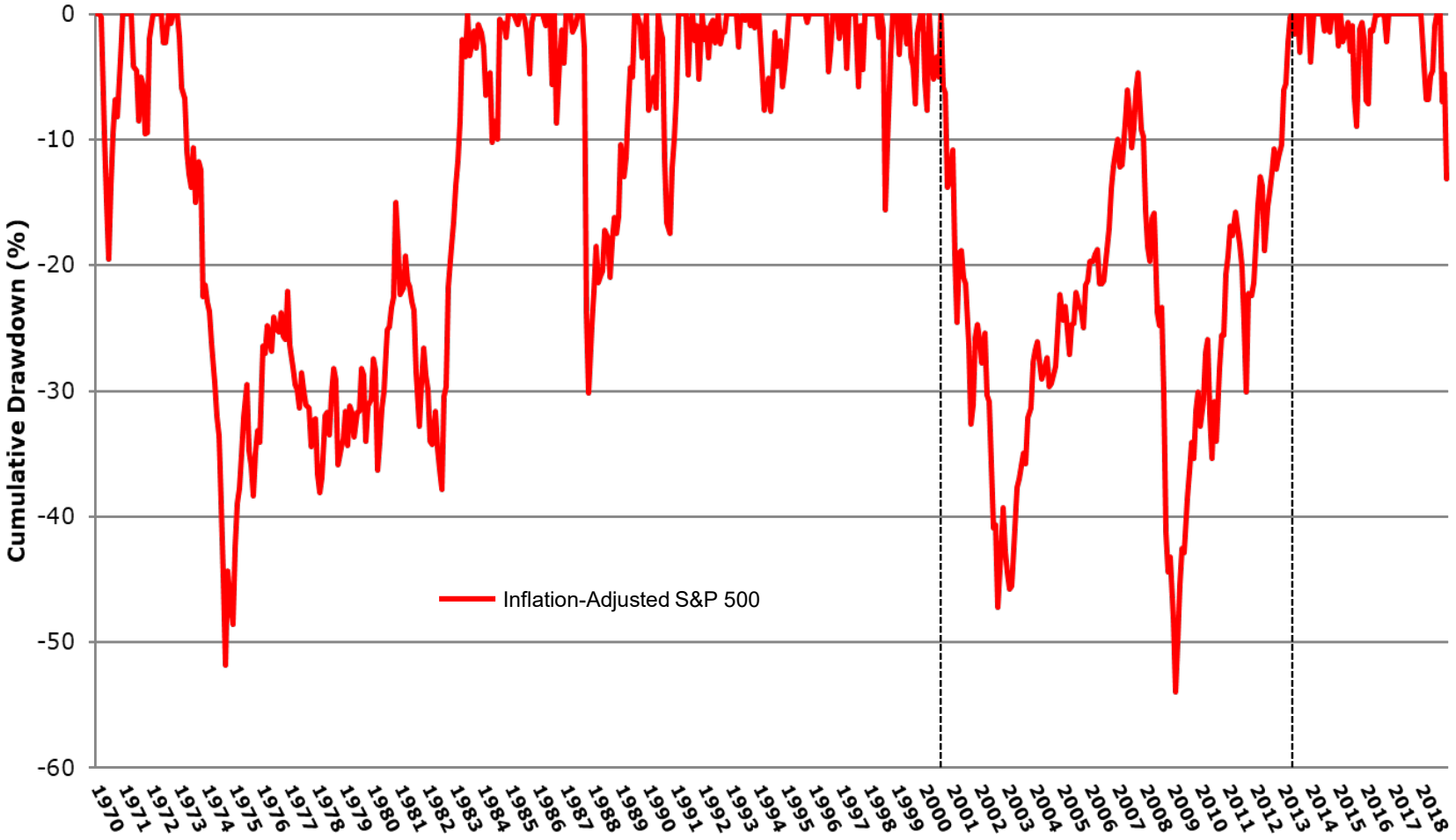
Data Source: Ibbotson Associates

Less Often Considered…



Data Source: Ibbotson Associates

Or Even Less…



Data Source: Ibbotson Associates

Investment Returns and Risk

- Investors often focus on investment returns and spend too little time thinking about investment risk
- Investment returns are a tangible, after-the-fact concept
  - You experience them directly
  - But you can't do anything about them – they are in the rear view mirror
- Investment risk represents the future – the range of possible investment outcomes
  - As trustees you manage risk by ensuring robust investment policies and process are in place

Reflection:

- Are most or all of our performance reports centered around returns?
- Do we ask our staff/outside advisors to provide risk analyses of our investment program?
- How much time do we spend evaluating investment risk at our meetings?

Words of Wisdom

The essence of investment management entails the management of risk, not the management of returns.

- Benjamin Graham

U.S. Capital Markets Returns: 1926 - 2018

	Large Co Stocks	L-T Gov Bonds	T-Bills	Inflation
1926	11.62	7.77	3.27	-1.49
1927	37.49	8.93	3.12	-2.08
1928	43.61	0.10	3.56	-0.97
1929	-8.42	3.42	4.75	0.20
1930	-24.90	4.66	2.41	-6.03
1931	-43.34	-5.31	1.07	-9.52
1932	-8.19	16.84	0.96	-10.30
1933	53.99	-0.07	0.30	0.51
↓				↓
2011	2.11	27.10	0.04	2.96
2012	16.00	3.43	0.06	1.74
2013	32.39	-12.78	0.02	1.50
2014	13.69	24.71	0.02	0.76
2015	1.38	-0.65	0.02	0.73
2016	11.96	1.75	0.20	2.07
2017	21.83	6.24	0.80	2.11
2018	-4.38	-0.57	1.81	2.17
Arith Avg	11.89	5.90	3.38	2.96
Geom Avg	10.00	5.47	3.34	2.88
Std Dev	19.78	9.83	3.10	4.02

Data Source: Ibbotson Associates

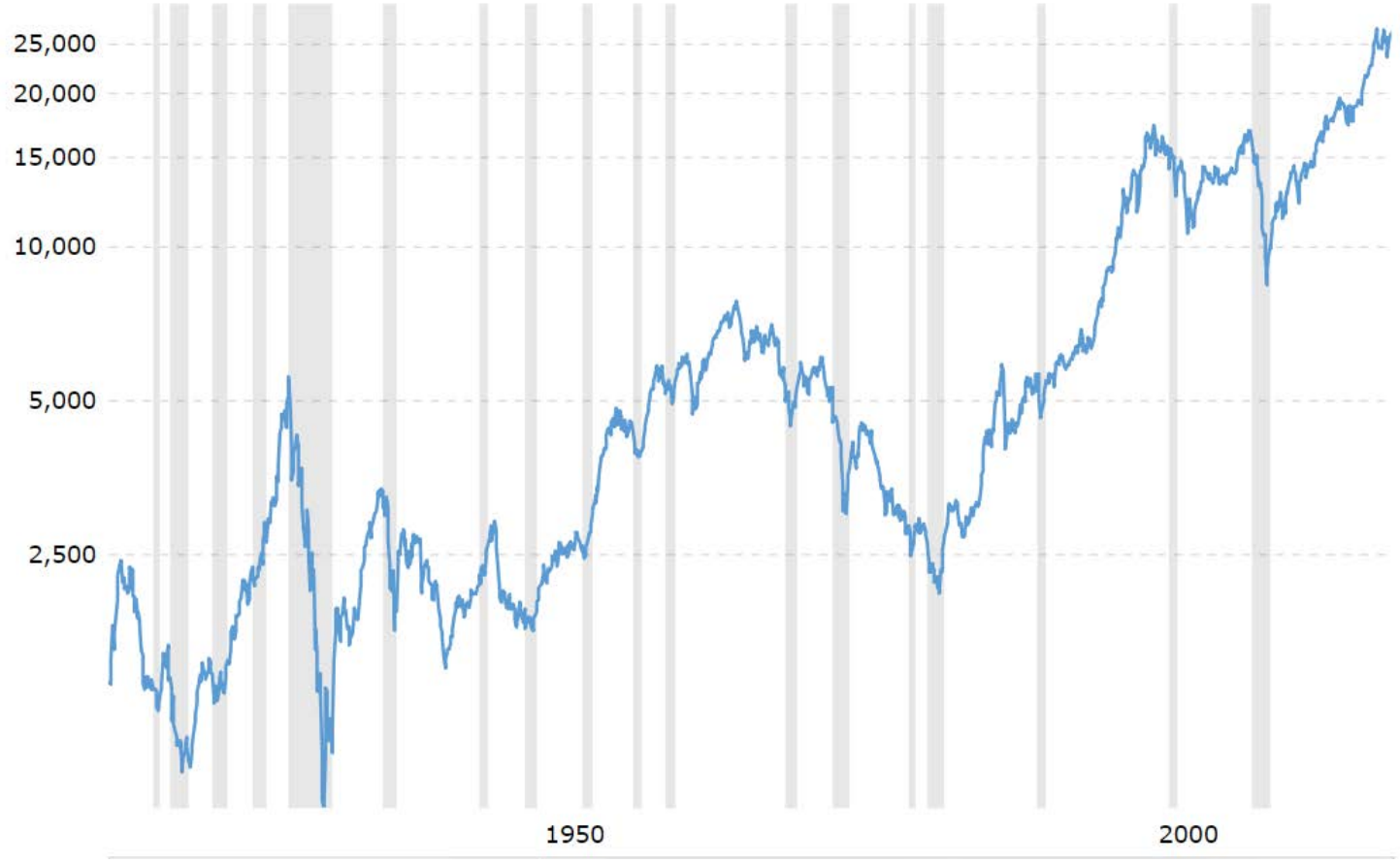
Why Should Stocks beat bonds?

- Because stocks are riskier, of course
  - **But what does that mean?**
- Stocks represent ownership in corporations
- Corporate earnings are sensitive to the economy
  - Hence, stocks are sensitive to changes in the economy
- Stocks are risky because they have a greater chance of doing badly in bad times
  - That is, stocks do poorly just at the time when you least want them to
  - Investors' cash flows are declining or in jeopardy
  - Investors attempt to reduce holdings at these times, resulting in relatively high volatility for stock returns
- So stocks need some redeeming feature
  - That feature is higher returns in "normal" times
- High quality bonds present the opposite side of the coin

S&P 500 Worst Days	10 Year Treasuries Worst Years
-20.47%	-11.12%
-12.94%	-9.10%
-10.16%	-8.25%
-9.92%	-8.04%
-9.12%	-5.01%
-9.07%	-4.96%
-9.03%	-2.99%
-8.93%	-2.65%
-8.88%	-2.56%
-8.79%	-2.26%

Source: Ben Carlson

U.S. Stocks and Recessions



Source: Macrotrends

Expected Returns

- We should expect stocks to outperform bonds
- So how might we develop expected returns?
- For high quality bonds we can look to current yields
- For risky assets like stocks, it's harder - two primary methods
  - Historical returns
  - Fundamentals
    - P/E's (need a forecast of E)
    - Risk free + historical equity risk premium
    - Inflation + income + real growth + repricing
- Alternative assets like private equity often involve tacking on some additional premium to expected stock returns

Reflection:

- Do we understand how expected returns are set for our fund?
- Who develops estimates of expected returns for the asset classes in our investment program?
- How often are our expected return assumptions reviewed?
- What roles do expected returns play in setting our investment policy?
- Over what time periods have we developed expected returns?

Risk

- Risk in a broad sense is simply the possibility of experiencing losses in pursuit of the fund's mission
- Some possible categories of risk
  - Investment risk
    - Market risk
    - Security specific (concentration) risk
    - Active management risk
    - Asset liquidity risk
  - Funding risk
  - Operational risk
  - Other categories (legal, regulatory, business, reputational)
- Our focus will be on various forms of investment risk

Reflection:

- What risks are most relevant to us as trustees?
- As trustees, do we concern ourselves with anything but various types of investment risk?
- Have we defined and prioritized the relevant risks that face the fund?

Different Risk Lenses

- Investment risk will take on a different character depending on the fund's mission
- Consider:
  - Open partially-funded public pension plan
  - Frozen fully-funded corporate pension plan
  - University endowment fund
- All the funds face the same capital markets
- But each fund has a different mission and therefore views investment risk from a different perspective

Reflection:

- What is the mission of our fund?
- How do we define investment risk for our fund?
- Is there general agreement among the trustees that the level of risk in the fund is consistent with the fund's mission?

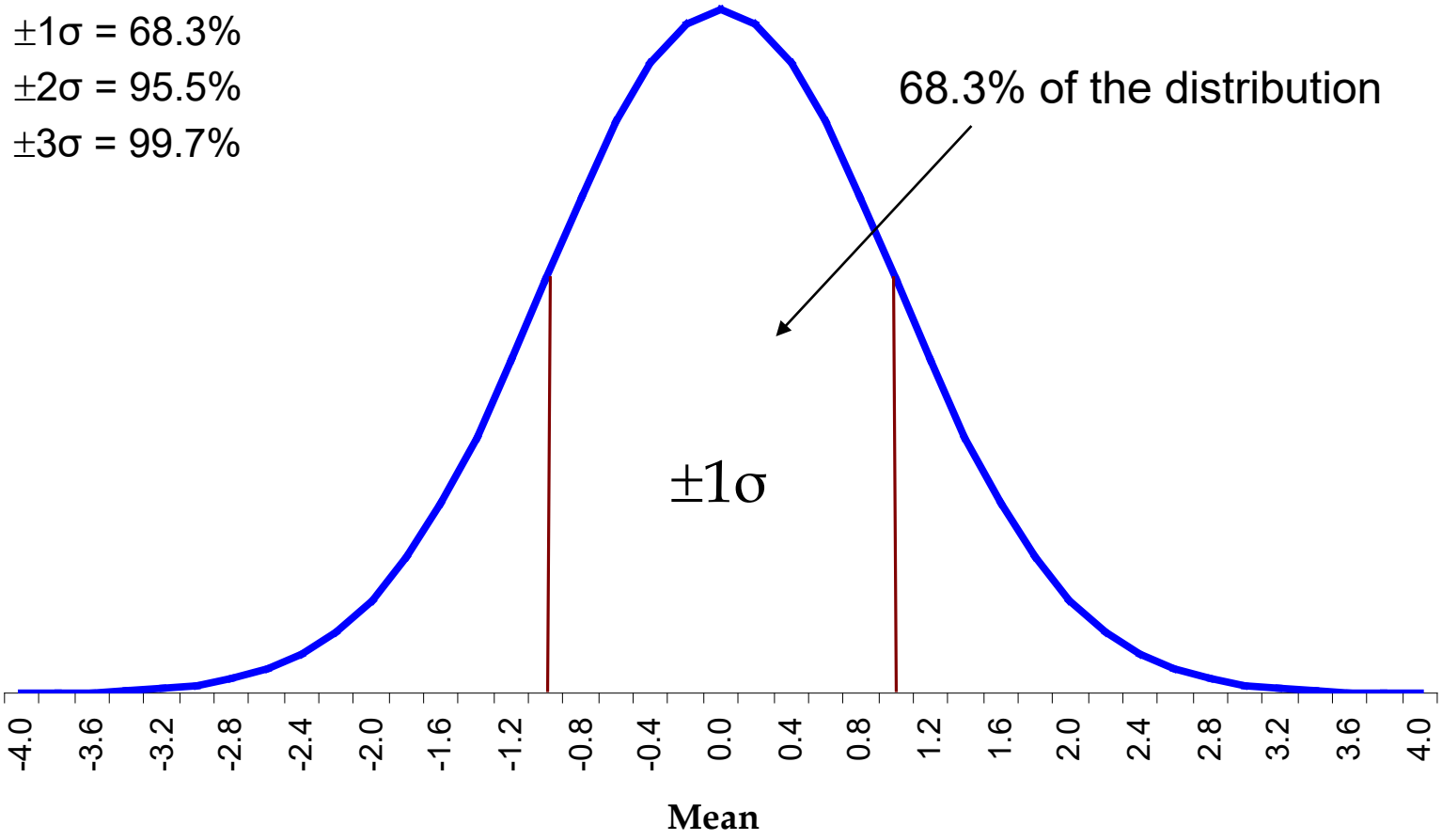
Quantifying Investment Risk

- Some practitioners don't even try to quantify risk
  - Rely on intuition, experience, rules of thumb to build portfolios that aren't overly dangerous
- More often, practitioners use the standard deviation of returns as the measure of risk
  - Assumes returns are normally distributed
  - Should be skeptical of any one measure
- More complex risk measures are sometimes used
  - Various measures of downside risk
  - Value at Risk
  - Stress tests

Reflection:

- Do we have a process for identifying, quantifying and managing investment risk?
- Have we discussed the use of alternative measures of investment risk?
- Do we produce periodic risk reports that discuss the various investment risks and the risk management/mitigation process?

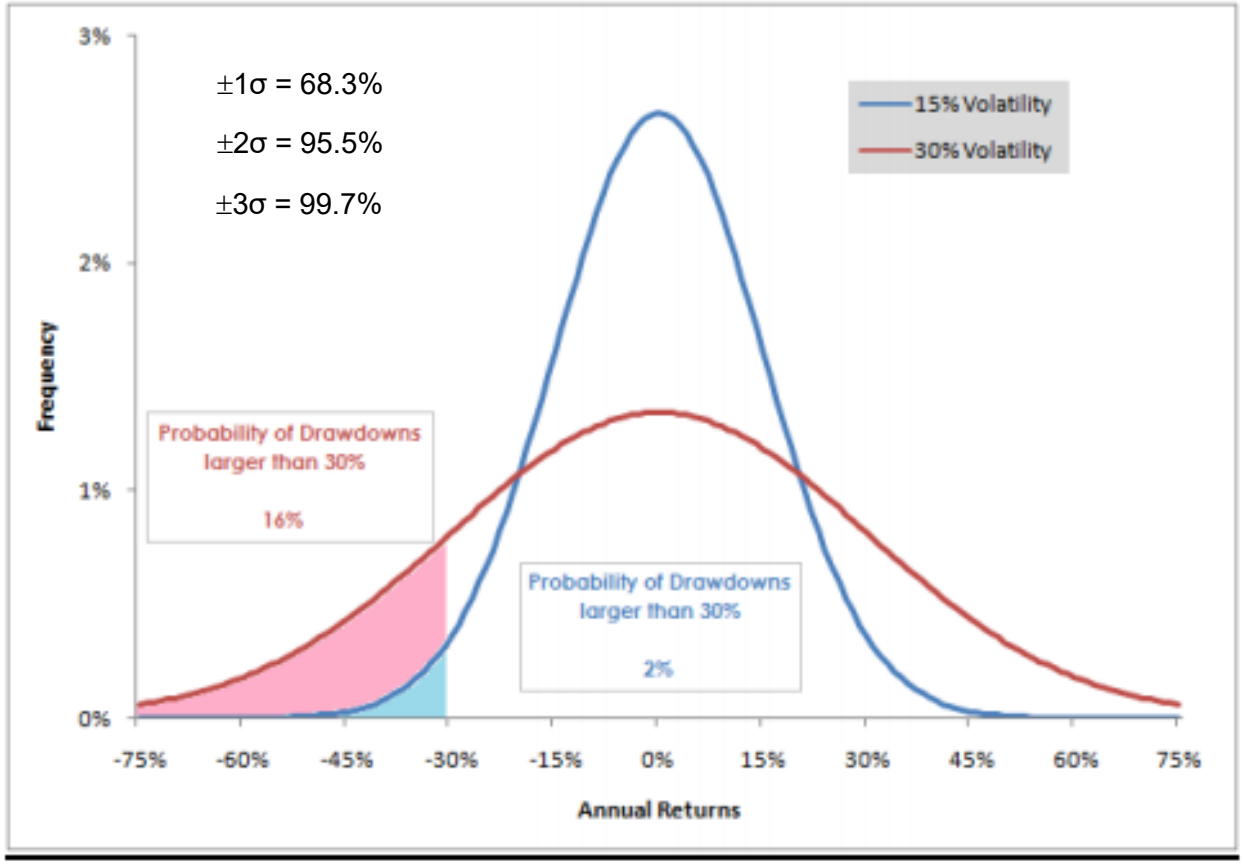
Normal Distribution



100-Year Flood

- You've probably heard someone say, "That was the third 100-year flood that we've had in the last 10 years."
- A 100-hundred year flood refers to a ~3-sigma event
  - There is roughly a 1% chance of occurrence of an event lying 3-standard deviations from the mean (a tail event)
  - That is, it is expected to happen only once in a hundred years
- Three plausible explanations for three "100-year floods" in a relatively short time period
  - Always had the wrong normal probability distribution
  - The probability distribution has changed
  - The probability distribution was never normal

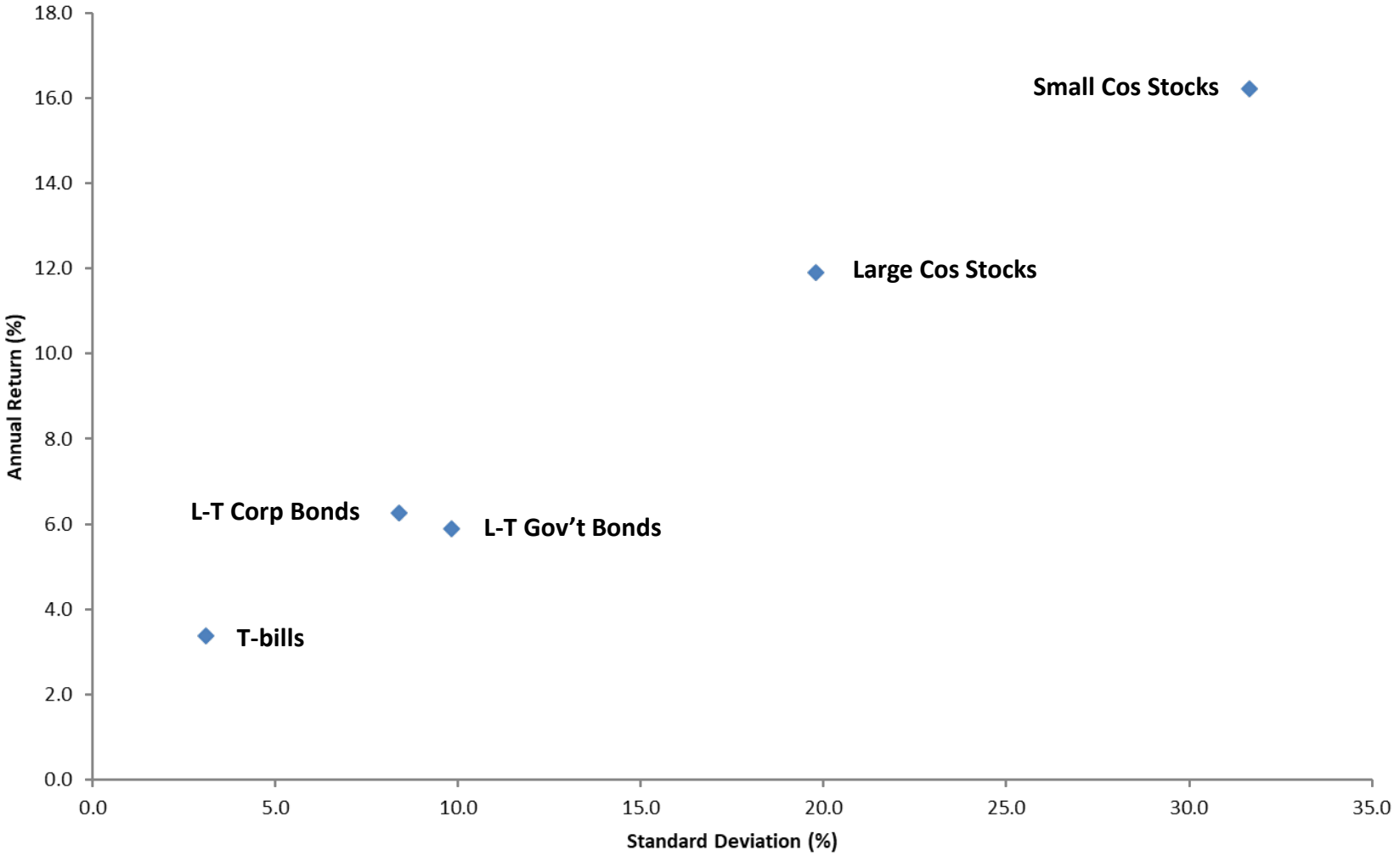
More/Less Dispersion



Are Investors Risk Averse?

- Typically assumed that investors don't like risk
  - For the same expected return, investors assumed to choose the investment with less risk
- Ask yourself which of two investments you prefer:
  - Guaranteed 8% return
  - 50% chance of 4% return, 50% chance of 12% return
- While there are good reasons not to expect investors to act rationally all the time, risk aversion is a fundamental tenet of investing
- If investors prefer less risk to more for the same expected return, we should see a positive relationship between expected returns and risk
  - Should show up in the long-term historical data as well
  - Asset classes with higher standard deviations should have higher realized returns

U.S. Capital Markets Realized Risk and Return: 1926 – 2018



Data Source: Ibbotson Associates

Behavioral Finance

- Standard investment finance assumes the existence of rational, utility-maximizing investors
  - Always do the best for themselves with available information
  - This assumption has been increasingly called into question
- BF involves the study of the impact of various cognitive biases on investment decisions, including:
  - Anchoring
  - Mental accounting
  - Framing
  - Loss aversion
- BF also explores the impact of investor errors in estimating the likelihood of relevant events due to factors such as:
  - Overconfidence
  - Representativeness
  - Over/Underreaction

Reflection:

- Have we discussed how various forms of group think might color our policy perspectives?
- How do we protect our decision-making process against cognitive biases?
- Have we maintained an environment where critical thinking is encouraged and rewarded?

Investment Risk Tolerance

- ***Risk capacity*** is the *financial ability* to endure potential losses and still achieve the fund's goals
- ***Risk tolerance*** is the *willingness* to bear investment risk
  - Individuals and groups have limits on how much volatility they can stomach
  - How would you feel if the value of your fund fell 10%? 20%? 50%? 75%?
- Finding a consensus on a group's risk tolerance is an iterative and highly subjective process
  - Difficult enough to do for an individual
  - Usually involves discussions among trustees and their advisors about maximum acceptable losses

Reflection:

- Do we have a sense of the fund's risk capacity?
- Do we have a sense of our collective risk tolerance?
- How did we trustees react to the market declines of 2000-2 and 2008-9?
- What types of discussions and studies have been carried out to determine the trustees' collective risk tolerance?
- Has the trustees' collective risk tolerance changed over time?

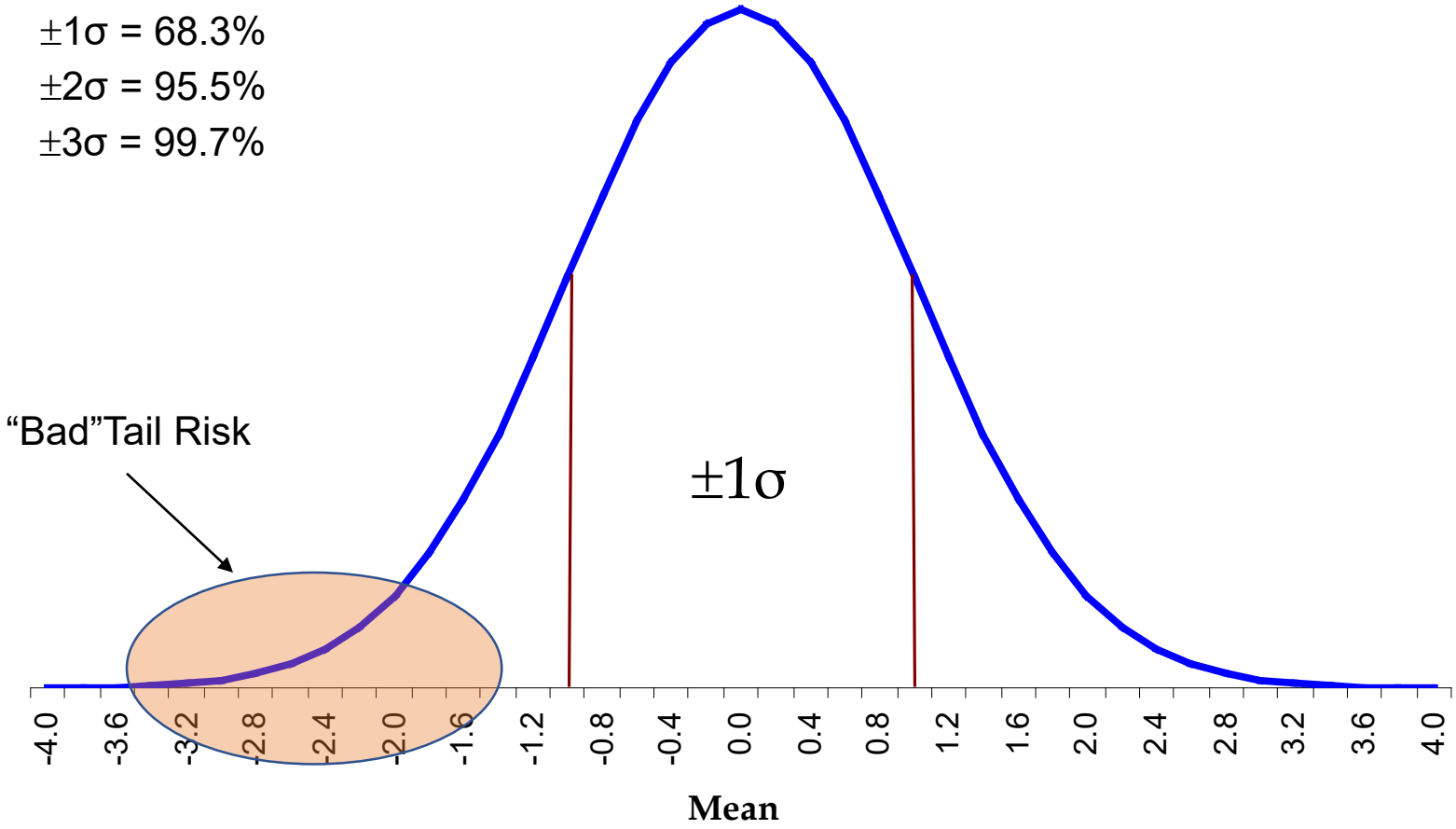
Tail Risk

- Tail risk refers to experiencing outcomes in the tails of a probability distribution
- Given two long and sharp stock market drawdowns that occurred in the last 15 years, there is considerable concern about tail risk
- Tactics to mitigate investment tail risk
  - Diversification strategies
  - Insurance strategies
  - Risk parity strategies
  - Black Swan strategies

Reflection:

- What does tail risk mean to our organization?
- Do we have a sense for how bad our investment outcomes might be in a "worst-case" scenario?
- How, if at all, do we attempt to protect the fund from tail risk events?

Normal Distribution



Managing Risk Through Diversification

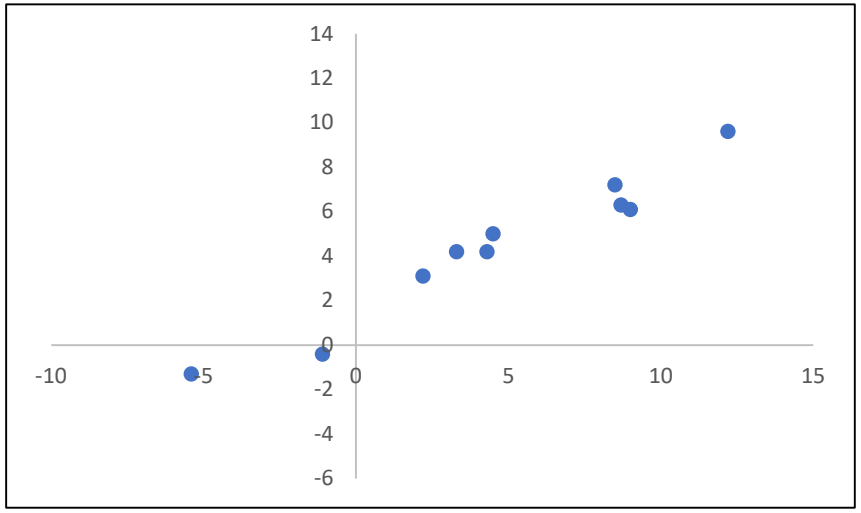
- A fund could protect itself against risk by paying hefty insurance premiums
- Much cheaper and simpler is to employ diversification
  - Build a portfolio out of investments whose returns do not move in the same direction at the same time
    - That is, find low-correlation assets
  - The one free lunch in investments
  - Trustees should ensure that all diversification opportunities have been considered
- Caveats
  - Beware assets that become highly correlated in periods of market stress
  - Avoid “gratuitous” diversification

Reflection:

- What is our policy toward diversification in the fund?
- In what areas of the investment program do we purposely (if at all) concentrate our investments? Why?
- Do we feel that we have explored all reasonable cost-effective diversifying investments?
- Are we comfortable that asset classes owned for diversification benefits are truly “diversifying”?

Positive and Negative Correlations

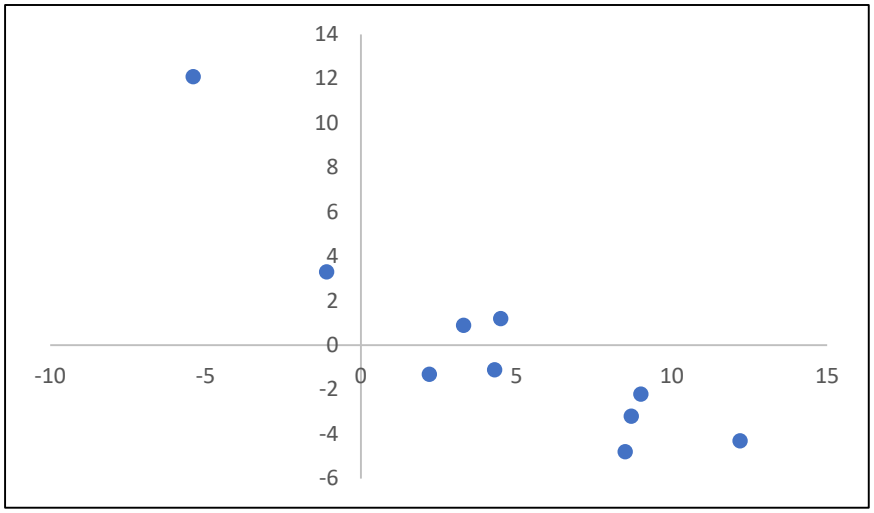
ROR_A vs ROR_B



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

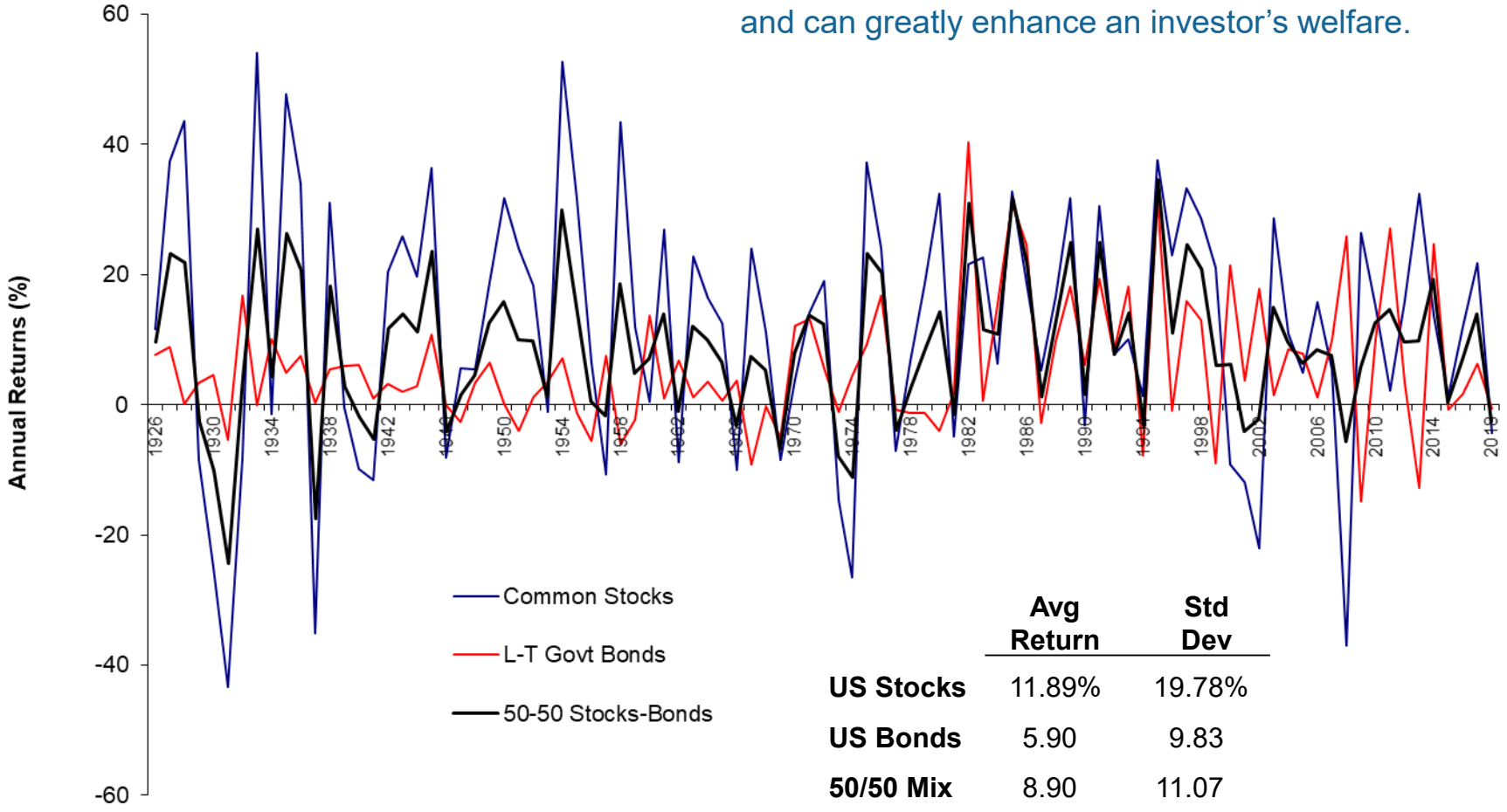
U.S. Capital Markets Returns
Correlation Matrix 1926 – 2018 (Annual Returns)

	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

Diversification in Action

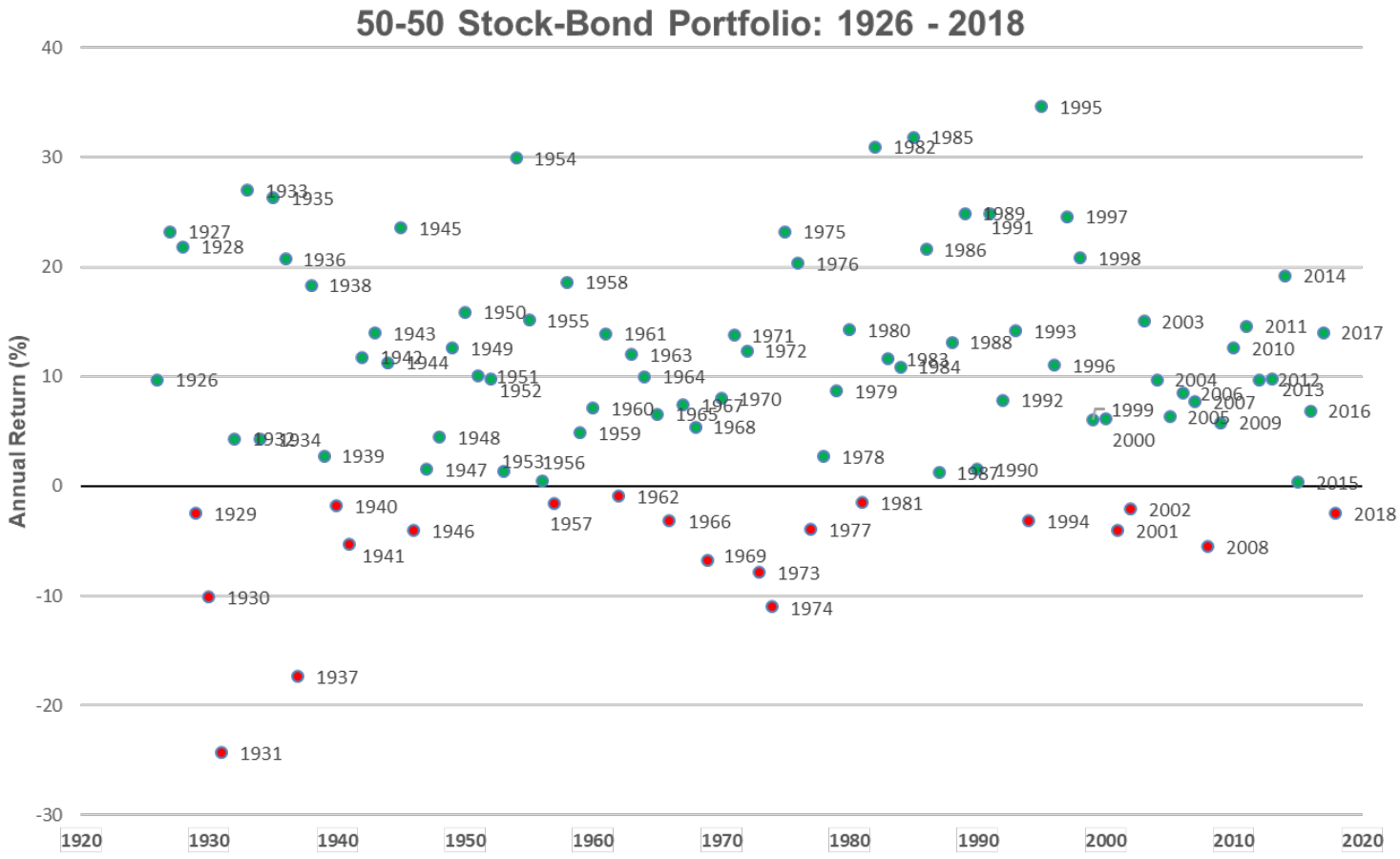
Adding non-perfectly correlated assets to a portfolio reduces risk. This addition is known as diversification and can greatly enhance an investor's welfare.



	Avg Return	Std Dev
US Stocks	11.89%	19.78%
US Bonds	5.90	9.83
50/50 Mix	8.90	11.07

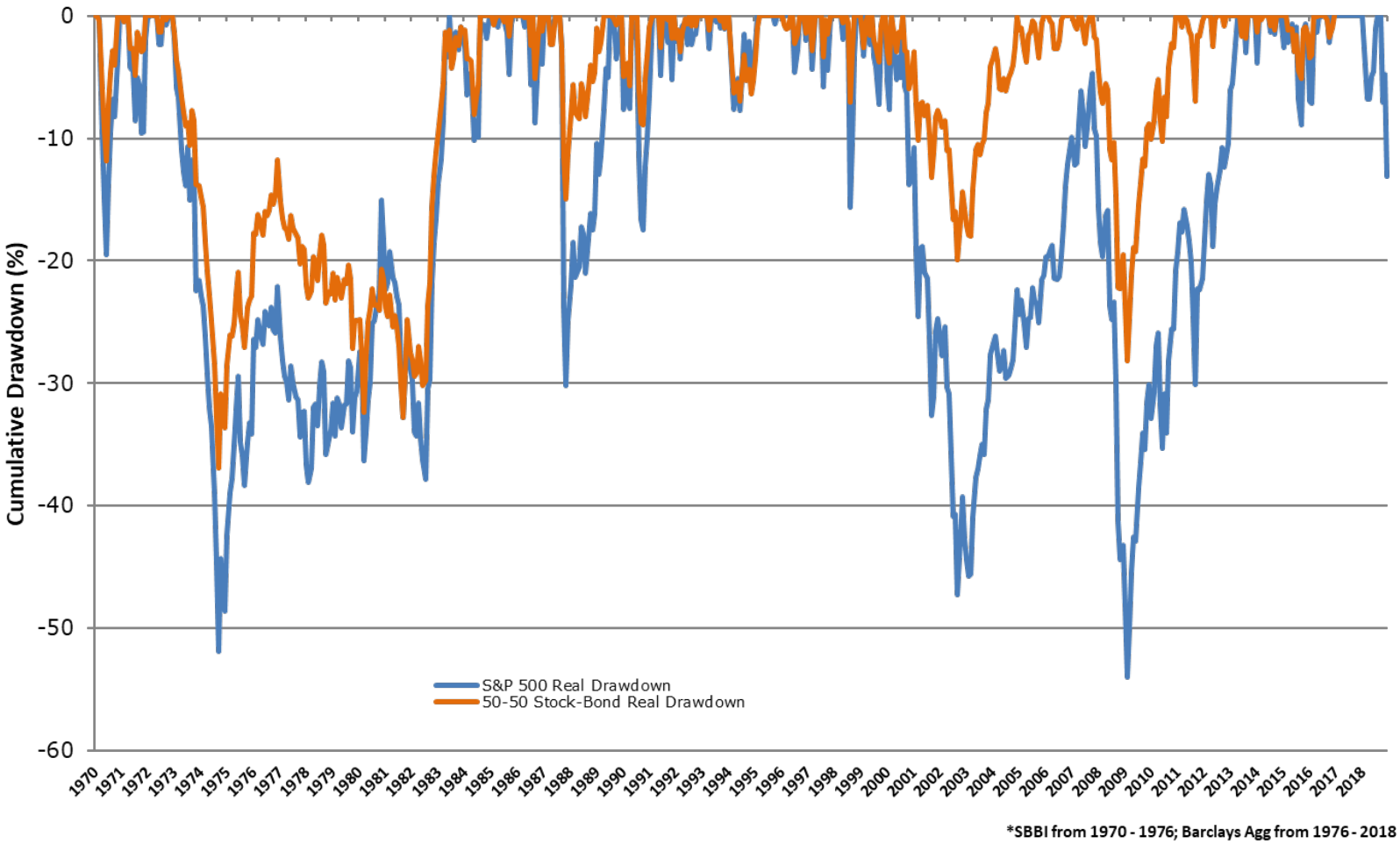
Data Source: Ibbotson Associates

Same Data, Another Perspective



Data Source: Ibbotson Associates

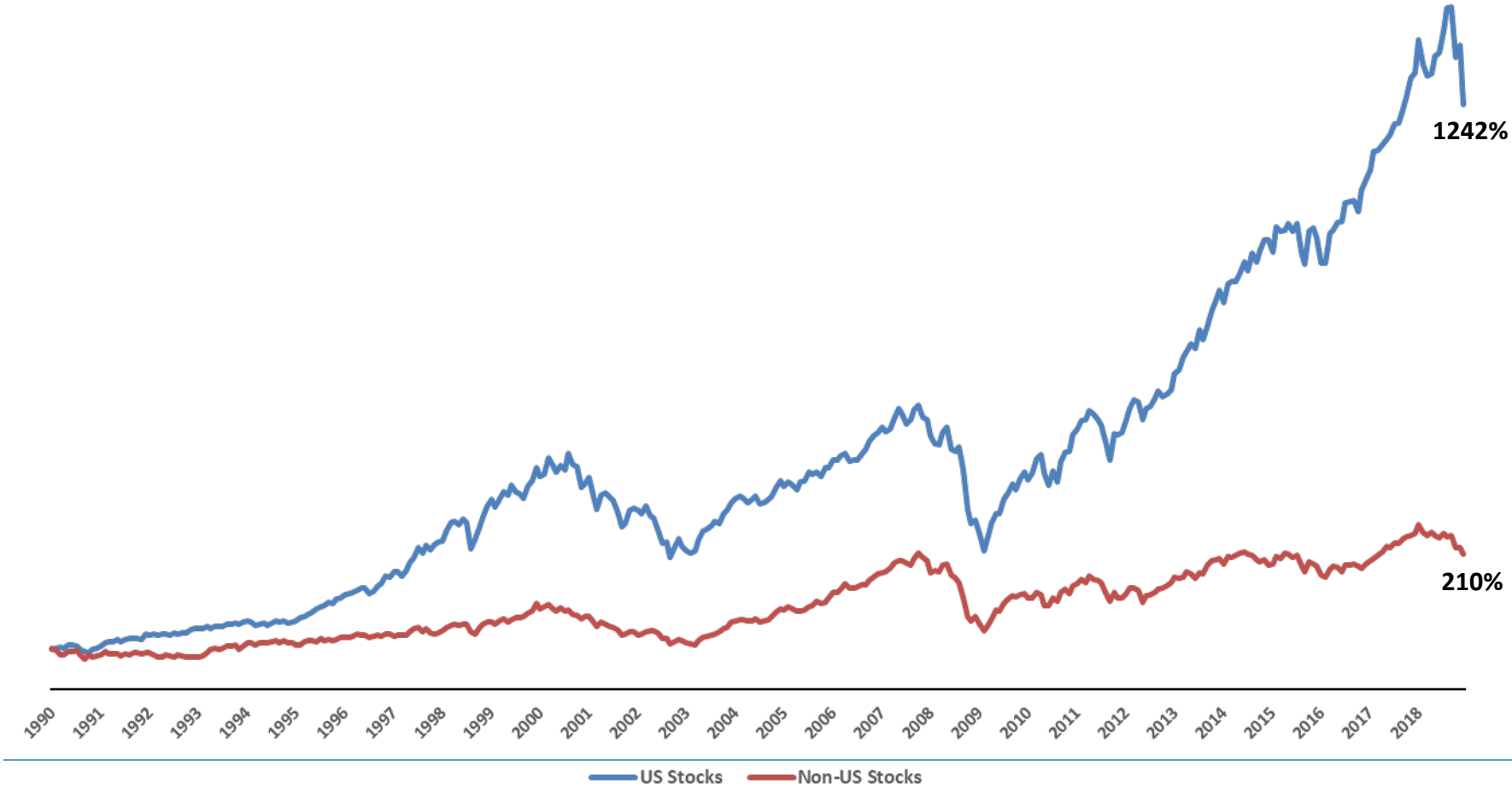
Diversification Smooths Real Return Drawdowns



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

Data Source: Callan LLC

Diversification Comes with Opportunity Costs



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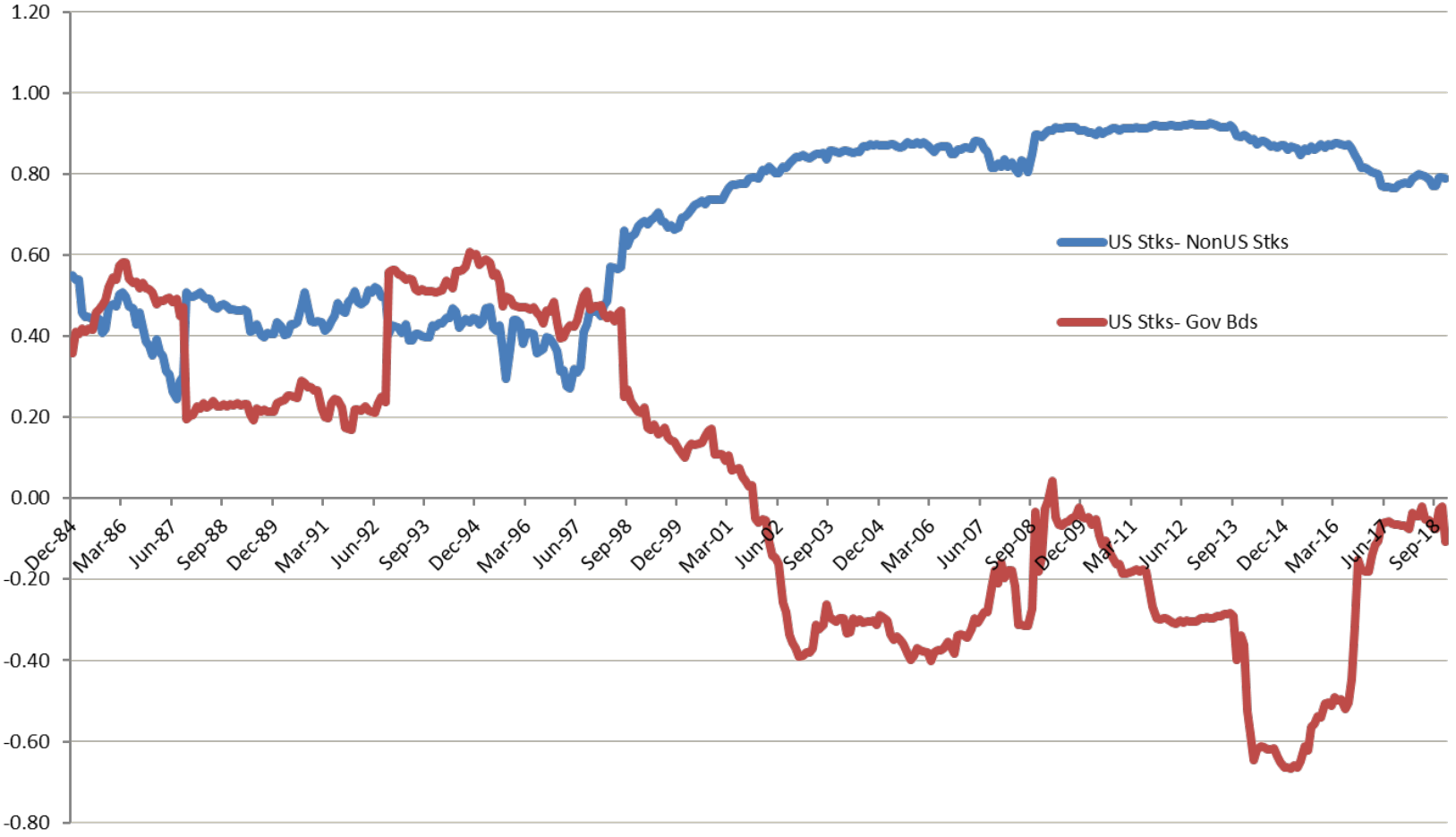
Data Source: Callan LLC

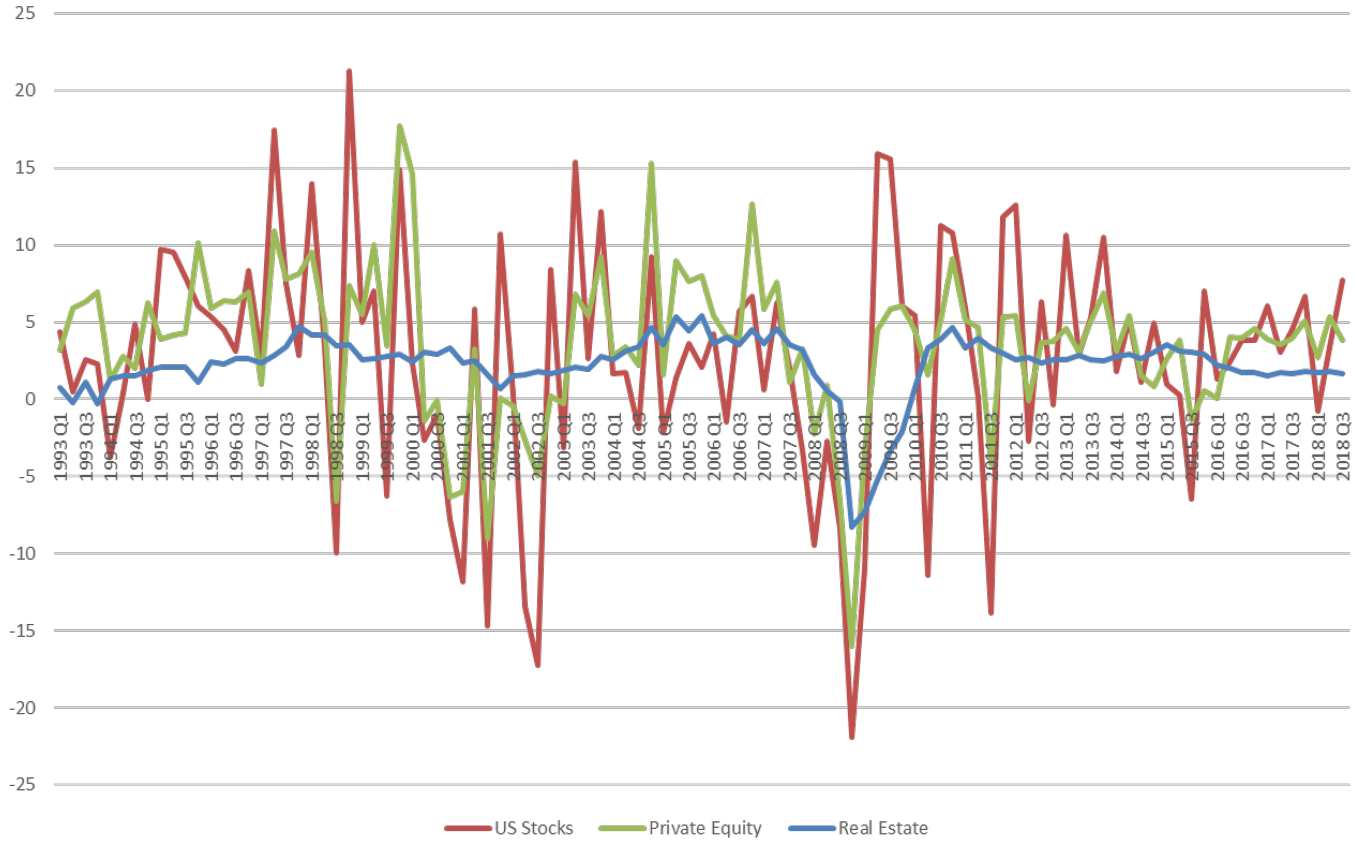
Changing Correlations



Data Source: Callan LLC

Integrating Alternatives with Public Securities

1993 - 2018



Historical Volatilities

US Equities	15.2%
Private Equity	9.8%
Real Estate	4.2%

Believable?

Correlation with US Stocks

Private Equity	.74
Real Estate	.19

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Real estate returns are based on an unleveraged index of property transactions
Private equity returns are based on an index of individual PE funds

Asset Class Performance Rotation

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Non-U.S. Equity 27.92%	Real Estate 13.84%	U.S. Fixed Income 8.43%	Non-U.S. Fixed Income 22.37%	Emerging Market Equity 55.82%	Real Estate 37.96%	Emerging Market Equity 34.00%	Real Estate 42.12%	Emerging Market Equity 39.38%	U.S. Fixed Income 5.24%	Emerging Market Equity 78.51%	Small Cap Equity 26.85%	U.S. Fixed Income 7.84%	Real Estate 27.73%	Small Cap Equity 38.82%	Real Estate 15.02%	Large Cap Equity 1.38%	Small Cap Equity 21.31%	Emerging Market Equity 37.28%	Cash Equivalent 1.87%	1
Small Cap Equity 21.26%	U.S. Fixed Income 11.63%	High Yield 5.28%	U.S. Fixed Income 10.26%	Small Cap Equity 47.25%	Emerging Market Equity 25.55%	Real Estate 15.35%	Emerging Market Equity 32.17%	Non-U.S. Equity 12.44%	Non-U.S. Fixed Income 4.39%	High Yield 58.21%	Real Estate 19.63%	High Yield 4.98%	Emerging Market Equity 18.23%	Large Cap Equity 32.39%	Large Cap Equity 13.69%	U.S. Fixed Income 0.55%	High Yield 17.13%	Non-U.S. Equity 24.21%	U.S. Fixed Income 0.01%	2
Large Cap Equity 21.04%	Cash Equivalent 6.18%	Cash Equivalent 4.42%	Real Estate 2.82%	Real Estate 40.69%	Non-U.S. Equity 20.38%	Non-U.S. Equity 14.47%	Non-U.S. Equity 25.71%	Non-U.S. Fixed Income 11.03%	Cash Equivalent 2.06%	Real Estate 37.13%	Emerging Market Equity 18.88%	Non-U.S. Fixed Income 4.36%	Non-U.S. Equity 16.41%	Non-U.S. Equity 21.02%	U.S. Fixed Income 5.97%	Cash Equivalent 0.05%	Large Cap Equity 11.96%	Large Cap Equity 21.83%	High Yield -2.08%	3
Real Estate 8.87%	Small Cap Equity -3.02%	Small Cap Equity 2.49%	Cash Equivalent 1.78%	Non-U.S. Equity 39.42%	Small Cap Equity 18.33%	Large Cap Equity 4.91%	Small Cap Equity 18.37%	U.S. Fixed Income 6.97%	High Yield -26.16%	Non-U.S. Equity 33.67%	High Yield 15.12%	Large Cap Equity 2.11%	Small Cap Equity 16.35%	High Yield 7.44%	Small Cap Equity 4.89%	Real Estate -0.79%	Emerging Market Equity 11.19%	Small Cap Equity 14.65%	Non-U.S. Fixed Income -2.15%	4
Cash Equivalent 4.85%	Non-U.S. Fixed Income -3.91%	Emerging Market Equity -2.61%	High Yield -1.37%	High Yield 28.97%	Non-U.S. Fixed Income 12.54%	Small Cap Equity 4.55%	Large Cap Equity 15.79%	Large Cap Equity 5.49%	Small Cap Equity -33.79%	Small Cap Equity 27.17%	Large Cap Equity 15.06%	Cash Equivalent 0.10%	Large Cap Equity 16.00%	Real Estate 3.67%	High Yield 2.45%	Non-U.S. Equity -3.04%	Real Estate 4.06%	Non-U.S. Fixed Income 10.51%	Large Cap Equity -4.38%	5
High Yield 2.39%	High Yield -5.86%	Non-U.S. Fixed Income -3.75%	Emerging Market Equity -6.16%	Large Cap Equity 28.68%	High Yield 11.13%	Cash Equivalent 3.07%	High Yield 11.85%	Cash Equivalent 5.00%	Large Cap Equity -37.00%	Large Cap Equity 26.47%	Non-U.S. Equity 8.95%	Small Cap Equity -4.18%	High Yield 15.81%	Cash Equivalent 0.07%	Cash Equivalent 0.03%	Small Cap Equity -4.41%	Non-U.S. Equity 2.75%	Real Estate 10.36%	Real Estate -5.63%	6
U.S. Fixed Income -0.83%	Large Cap Equity -9.11%	Real Estate -3.81%	Non-U.S. Equity -15.80%	Non-U.S. Fixed Income 19.36%	Large Cap Equity 10.88%	High Yield 2.74%	Non-U.S. Fixed Income 8.16%	High Yield 1.87%	Non-U.S. Equity -43.56%	Non-U.S. Fixed Income 7.53%	U.S. Fixed Income 6.54%	Real Estate -6.46%	U.S. Fixed Income 4.21%	U.S. Fixed Income -2.02%	Emerging Market Equity -2.19%	High Yield -4.47%	U.S. Fixed Income 2.65%	High Yield 7.50%	Small Cap Equity -11.01%	7
Non-U.S. Fixed Income -8.83%	Non-U.S. Equity -13.37%	Large Cap Equity -11.89%	Small Cap Equity -20.48%	U.S. Fixed Income 4.10%	U.S. Fixed Income 4.34%	U.S. Fixed Income 2.43%	Cash Equivalent 4.85%	Small Cap Equity -1.57%	Real Estate -48.21%	U.S. Fixed Income 5.93%	Non-U.S. Fixed Income 4.95%	Non-U.S. Equity -12.21%	Non-U.S. Fixed Income 4.09%	Emerging Market Equity -2.60%	Non-U.S. Fixed Income -3.09%	Non-U.S. Fixed Income -6.02%	Non-U.S. Fixed Income 1.49%	U.S. Fixed Income 3.54%	Non-U.S. Equity -14.09%	8
		Non-U.S. Equity -21.40%	Large Cap Equity -22.10%	Cash Equivalent 1.15%	Cash Equivalent 1.33%	Non-U.S. Fixed Income -8.65%	U.S. Fixed Income 4.33%	Real Estate -7.39%	Emerging Market Equity -53.33%	Cash Equivalent 0.21%	Cash Equivalent 0.13%	Emerging Market Equity -18.42%	Cash Equivalent 0.11%	Non-U.S. Fixed Income -3.08%	Non-U.S. Equity -4.32%	Emerging Market Equity -14.92%	Cash Equivalent 0.33%	Cash Equivalent 0.86%	Emerging Market Equity -14.58%	9

Non-U.S. Fixed Income | Non-U.S. Equity | Real Estate | U.S. Fixed Income | Small Cap Equity | High Yield | Cash Equivalent | Large Cap Equity | Emerging Market Equity

Data Source: Callan LLC

Risk Budgeting

- Naïve diversification only gets the investor so far
- The ability to bear risk is a scarce resource
  - Just considering how the fund's capital is allocated is not enough
    - Do we care if 10% of the fund is invested in T-bills or small cap emerging market stocks?
  - Risk should be allocated to investments that offer the most return for the amount of risk invested
  - Eliminate uncompensated risk and focus on the most desirable forms of compensated risk
- Formal risk budgeting requires estimates of expected returns, correlations and standard deviations among the various possible investments
  - This data fed into a risk model and an optimal allocation that balances risk and expected return is the output

Reflection:

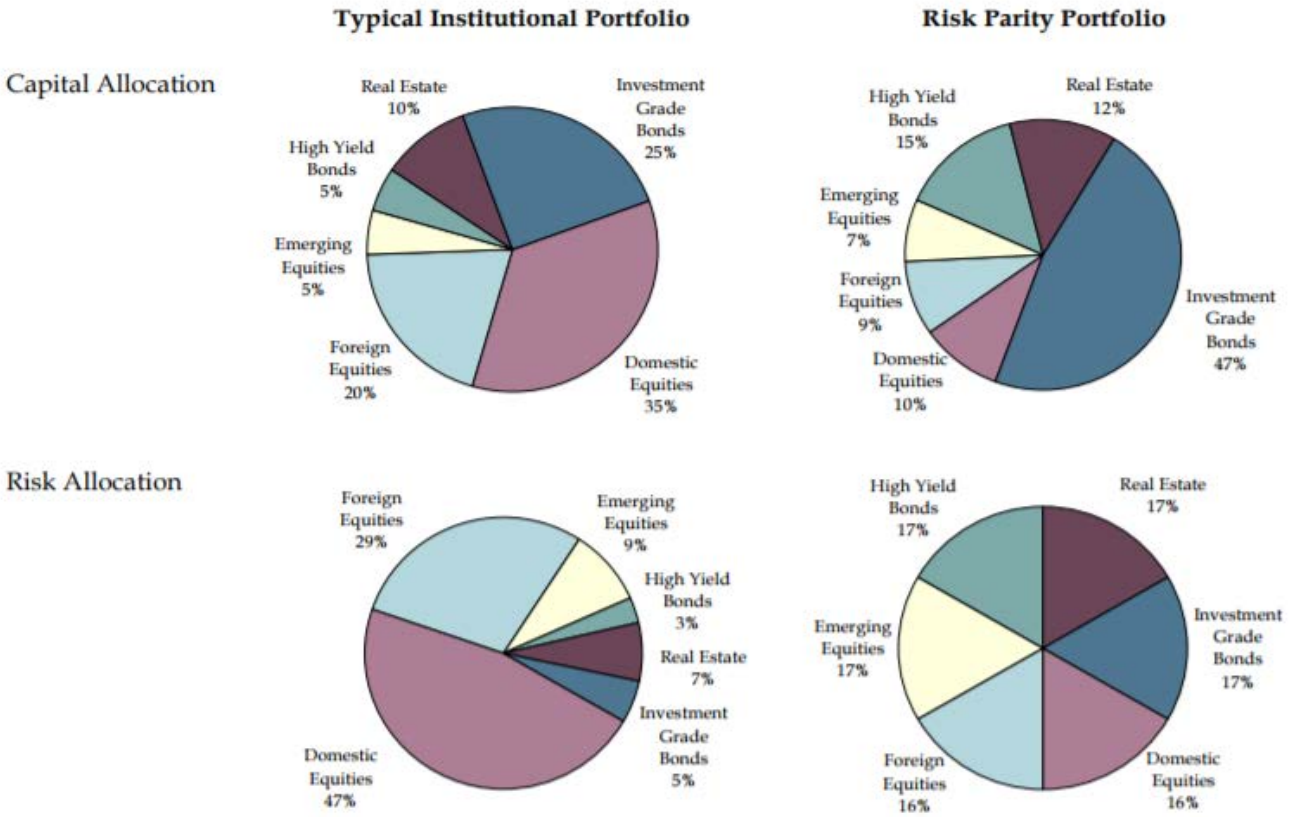
- How do we go about allocating risks to different types of investments?
- Who is responsible for our risk management efforts?
- Are we comfortable with the assumptions that go into our risk models?

"Typical" Institutional Portfolio: Effective Risk Budgeting?

Asset Category	Asset Allocation	Risk Allocation	
US Equity	36%	52%	
Int'l Equity	22	25	**91%**
Private Equity	5	14	
US Bonds	23	4	
Int'l Bonds	2	0	
Real Estate	5	2	
Hedge Funds	2	0	
Natural Resources	5	3	
Total	100%	100%	

Expected volatility ~10-12%

Risk Parity vs Traditional Allocations



Source: Meketa Investment Group

Active and Passive Management

- ***Active management*** is any investment strategy designed to systematically outperform a target (benchmark) portfolio on a risk-adjusted basis
  - Involves holding ***active positions*** (portfolio position less benchmark position), both positive and negative
  - Not an all or nothing decision
- ***Passive management*** refers to investment strategies designed to match the performance of a specified target (benchmark) portfolio
  - No valuation judgments are made regarding securities, economic sectors, or asset categories
  - By definition, no active positions
- The degree of active management can be measured by the expected volatility of returns around the assigned benchmark (termed ***active risk***)
  - Unlike market risk, we shouldn't assume that active risk is compensated

Reflection:

- Have we discussed the merits of active and passive management as a group?
- What is the rationale for our use (if any) of active management in each of the asset classes?
- Do we consider the fees and transactions costs of engaging in active management?
- What assets classes do we think have investable passive funds?

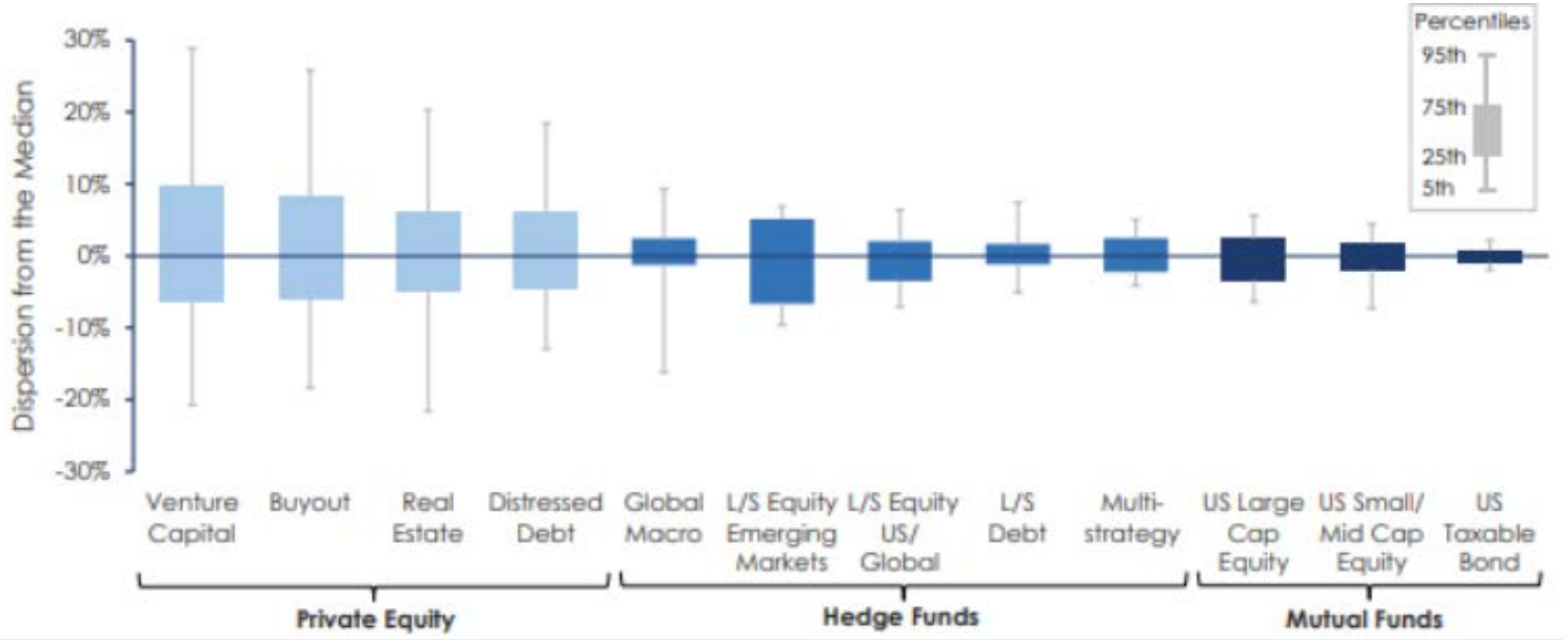
Public Equity Strategies

- Indexed equity
  - Designed to track the performance of an equity index
- Enhanced index equity
  - Designed to slightly beat the index by taking many small active positions
- Factor allocations
  - Hold “style” tilts to factors, but passively manage within the factor exposures
- Active equity (long only)
  - Designed to outperform the index by taking (possibly large) active positions
- 130-30 strategies
  - Take short positions which finance levered long positions; net long
- Long-short market neutral
  - Hold zero-beta portfolio, where long positions equal short positions and positions are optimized to eliminate beta (market) risk
- Hedge funds
  - Can do just about anything in search of absolute returns

Reflection:

- Where do we tend to lie on this spectrum of passive to active management?
- How aggressive are our active management strategies?
- Do we measure the active risk of our managers?
- How do we take into account the correlation of managers’ active returns?

Dispersion of Returns for Active Managers



Source: Preqin and Morningstar Direct.

Note: L/S=long/short; Calculations for private equity investments based on net internal rate of return since-inception for vintage years 2000-2015; Calculations for hedge funds and mutual funds based on trailing 5-year annualized returns through 12/31/2018 using returns net of expenses with income reinvested.

Active Management Belief Statements

- **Existence**
- **Identification**
- **Structure**
- **Tolerance**
- **Need**

- *Use of active management requires a positive answer to each belief statement*
- *Passive management should be the default position*

By definition, active managers on average must lose to passive management

Final Comments and Conclusions