American Association of Individual Investors
presents
Financial Planning Workshop

Building a Diversified Portfolio

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Financial Planning Workshops

- Fundamentals of Investing
- >>> Building a Diversified Portfolio
- Introduction to Computerized Investing
- Active versus Passive Investing Strategies
- Retirement Planning
- Managing your Cash Flow in Retirement
- Safe Withdrawal Rates from your Retirement Portfolio
- Social Security and Medicare
- Estate Planning

Last Month

- Fundamentals of Investing
  - Your Personal Investor Profile, PIP
  - Risk and return measurements
  - Techniques to control risk
  - Investment vehicles

- Slides available at www.siliconvalleyaaii.org
- Also link to webcast recording

Topics Covered Today

- Modern Portfolio Theory
- Characteristics of asset classes
- Building and rebalancing your portfolio
- Your Investment Policy Statement

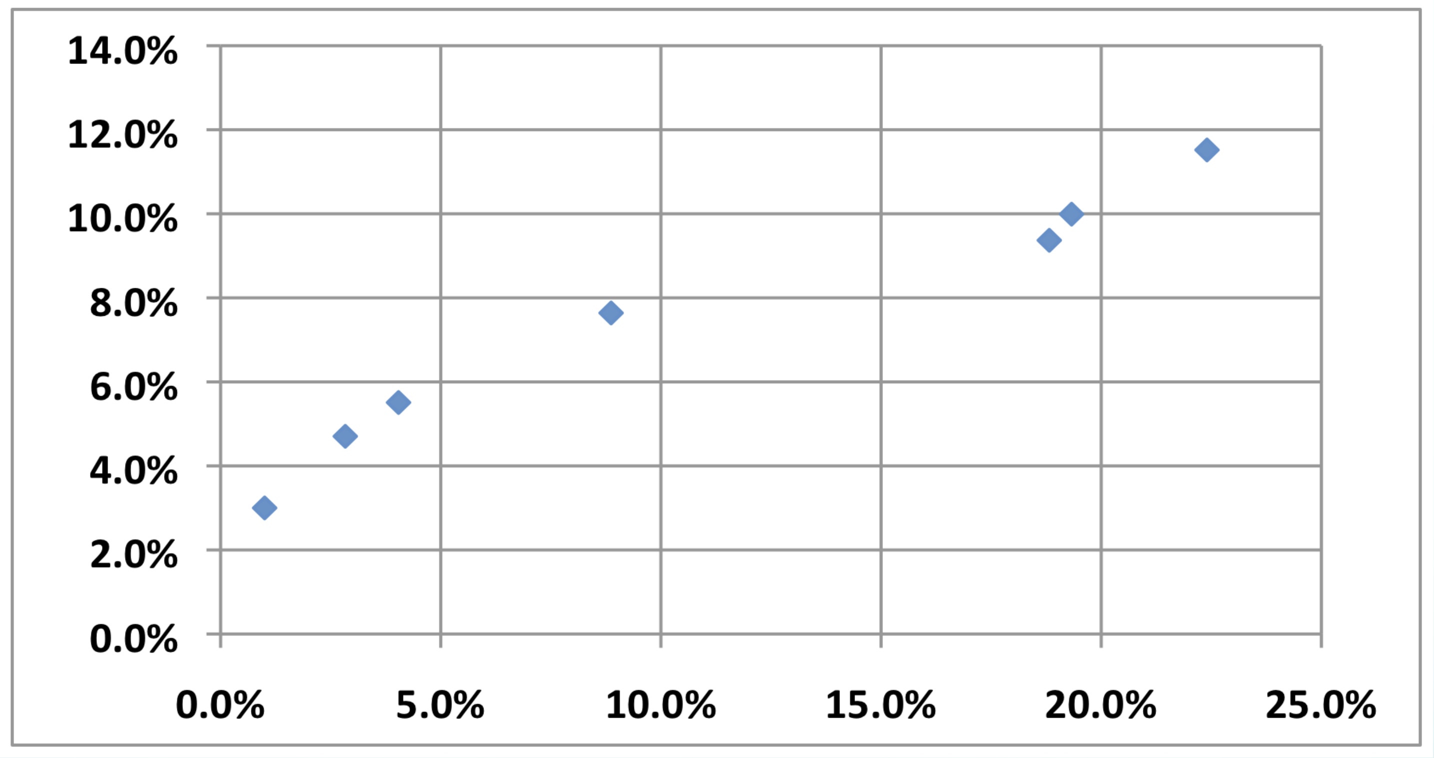
Modern Portfolio Theory

- Theory on how risk-averse investors can construct a portfolio to maximize the expected return for a given level of market risk

- First formulated by Harry Markowitz in 1952

- Further developed by Bill Sharpe et al over the next two decades

Risk and Return are Correlated



Return

Standard Deviation (10 yrs)

T-Bills Bonds Stocks

The Third Dimension

- Total return, R
- Standard deviation, S
- Correlation, C

  Measures how well two assets track each other

  C = 1 for perfect tracking, i.e. zig and zag together

  C = 0 for no correlation

  C = -1 for perfect negative correlation

  i.e. one asset zigs every time the other zags

Basic MPT Equations

- For a portfolio, P, with 2 risky assets, A and B
  with expected total returns R_A and R_B,
  and standard deviations S_A and S_B
  and correlation C_{AB}
  and weights W_A and W_B in the portfolio

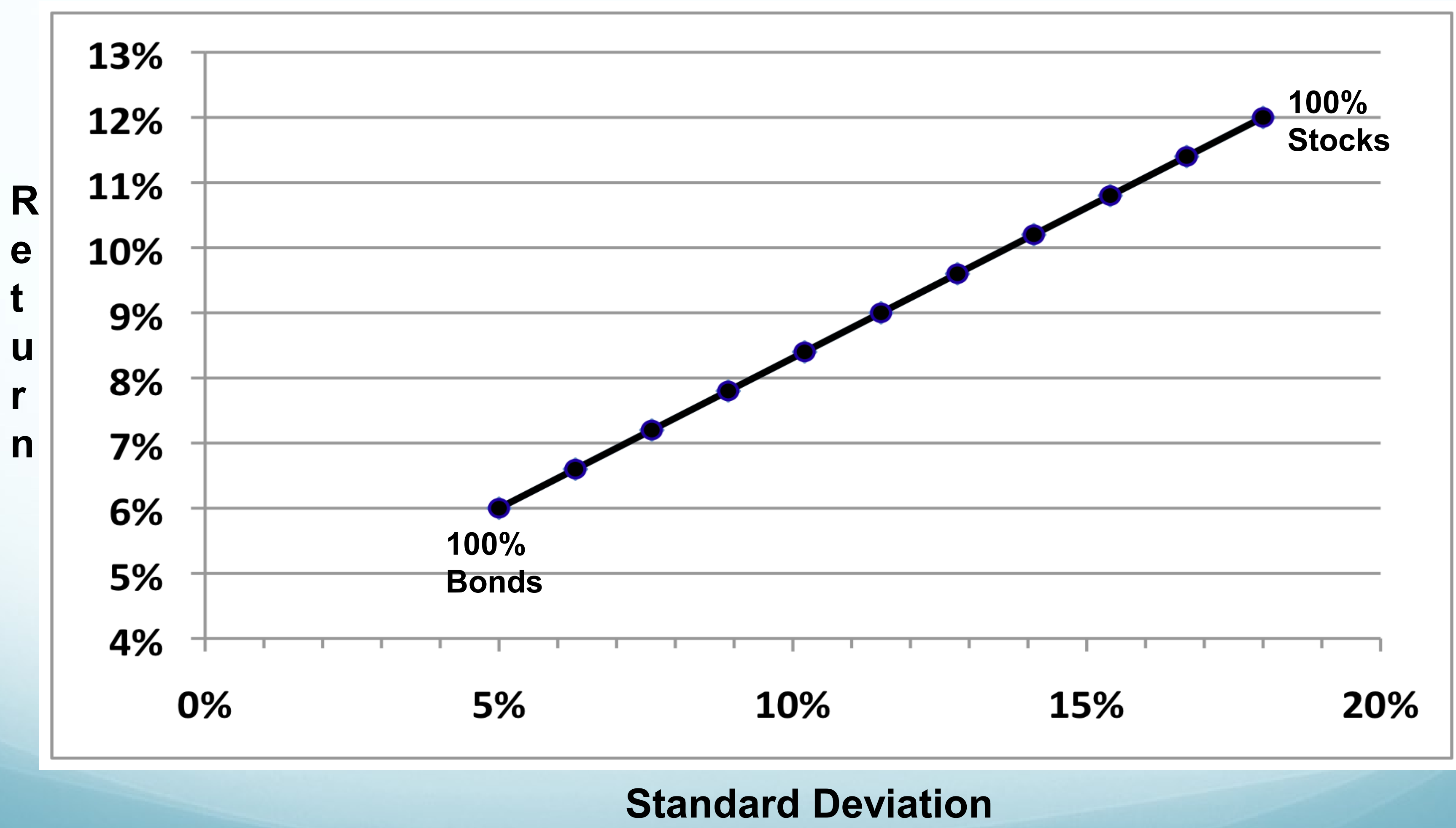
$R_P = W_A \times R_A + W_B \times R_B$

$S_P = \text{SqRt}\{(W_A \times S_{A)})\text{^}2 + (W_B \times S_B)\text{^}2$
$+ 2 \times W_A \times S_A \times W_B \times S_B \times C_{AB}\}$

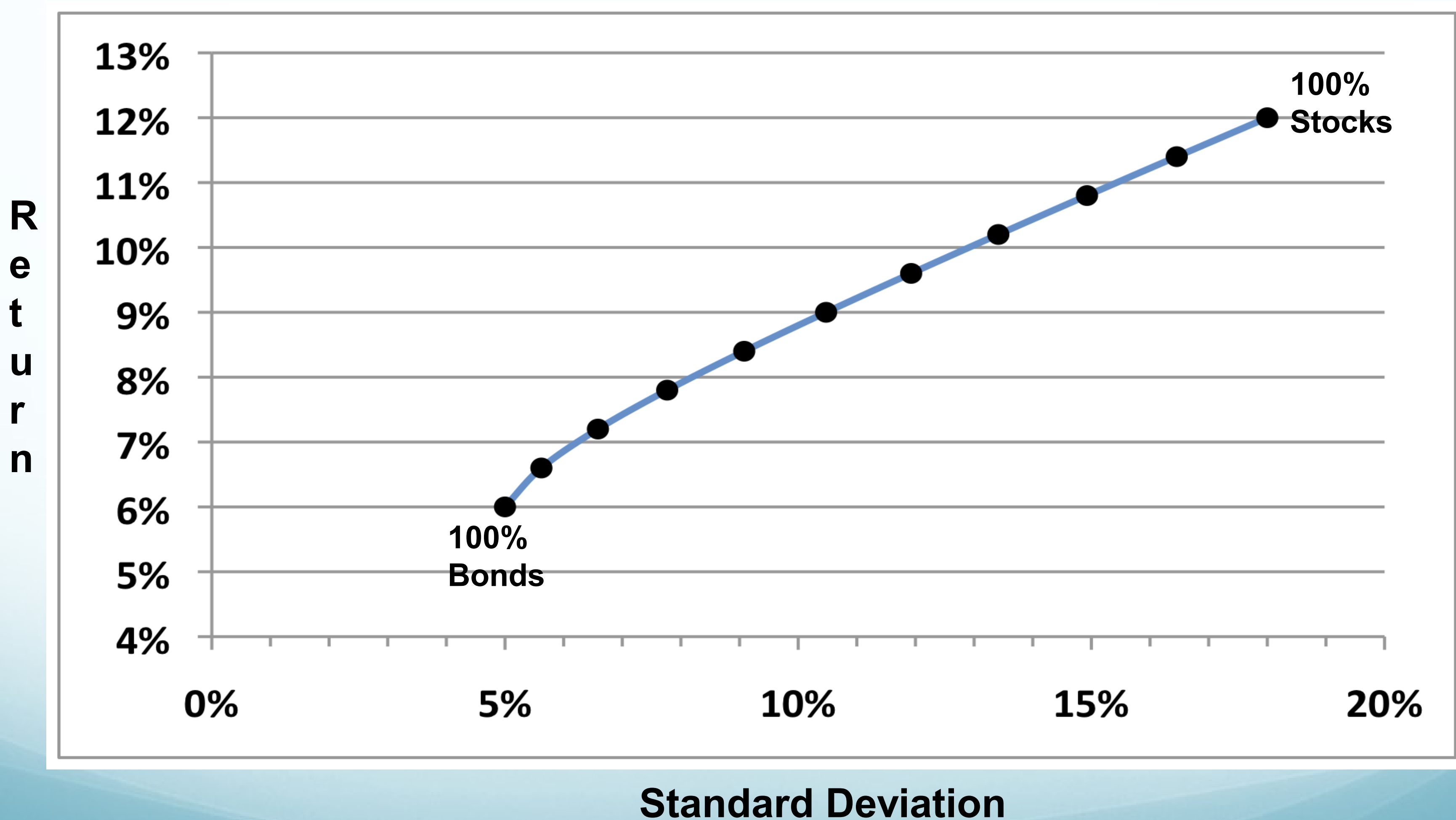
Simple Portfolio with 2 Risky Assets

- First asset (e.g. a bond fund)
  - Return = 6%
  - Standard deviation = 5%
- Second asset (e.g. a stock fund)
  - Return = 12%
  - Standard deviation = 18%
- Weights: Vary from 0, 10%, 20% … 100%
- Correlation: Vary from +1.0, +0.5, 0, -0.5, -1.0

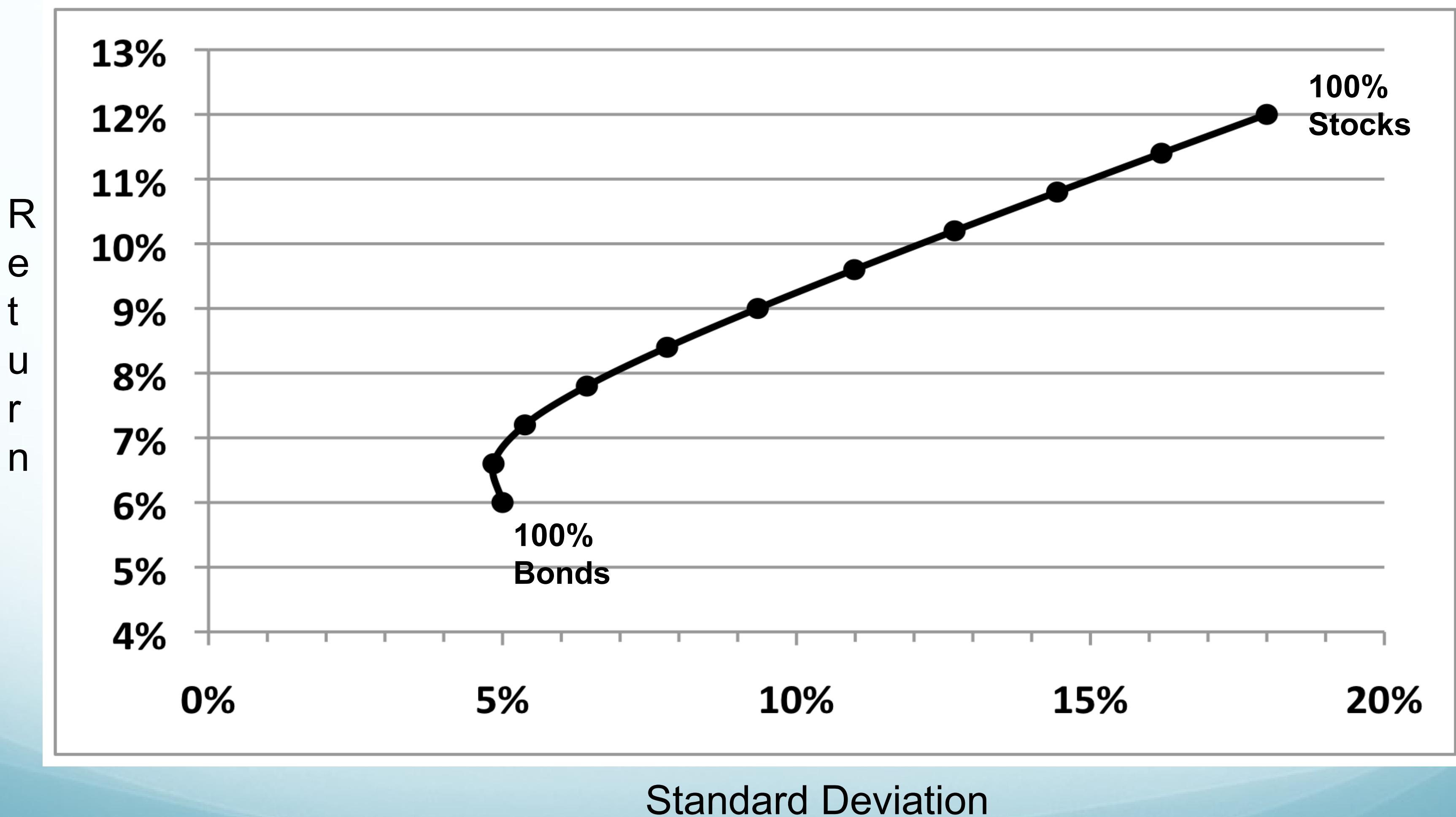
2 Assets: Correlation = +1.0



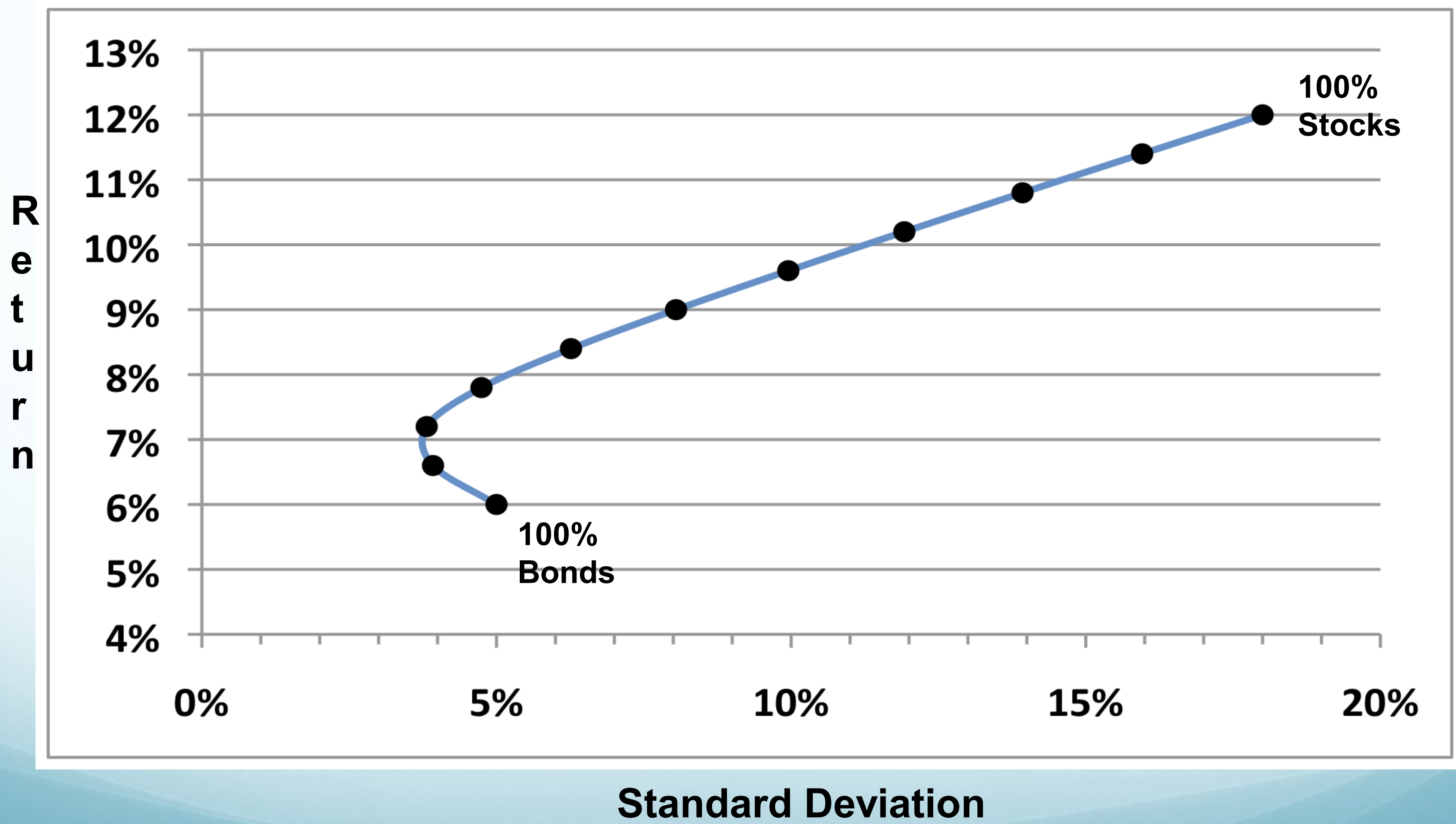
2 Assets contd: Correlation = +0.5



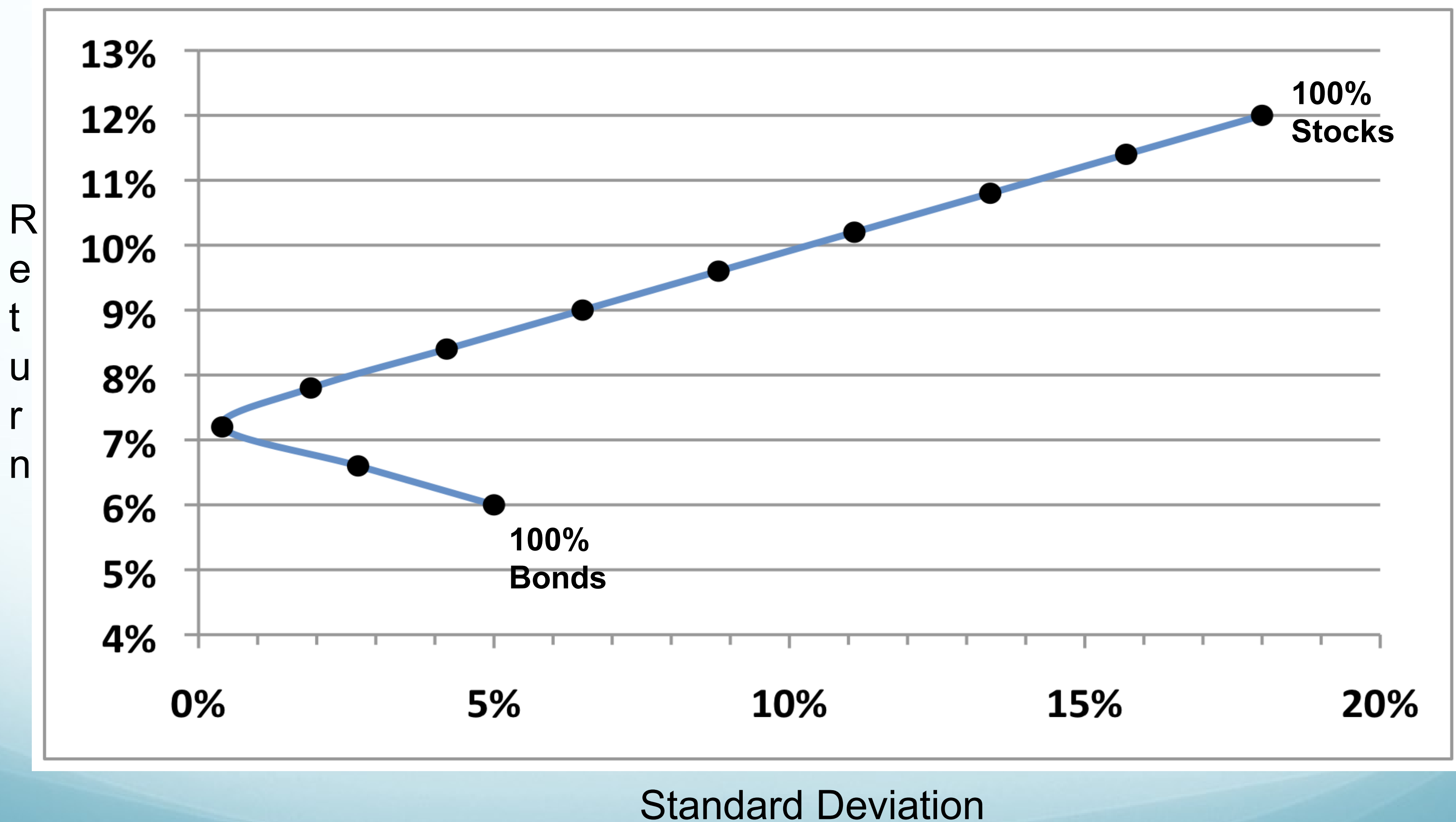
2-Assets contd: Correlation = 0



2 Assets contd: Correlation = -0.5



2 Assets contd: Correlation = -1.0



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- Your Investment Policy Statement

The Brinson Study

- 1986 Study by Gary Brinson et al., Updated 1991

  Survey of 82 major pension funds

- Contributions to variance in portfolio performance

  >91% Investment policy decisions

  i.e. deciding on asset classes and weights

  <5% Security selection within asset class

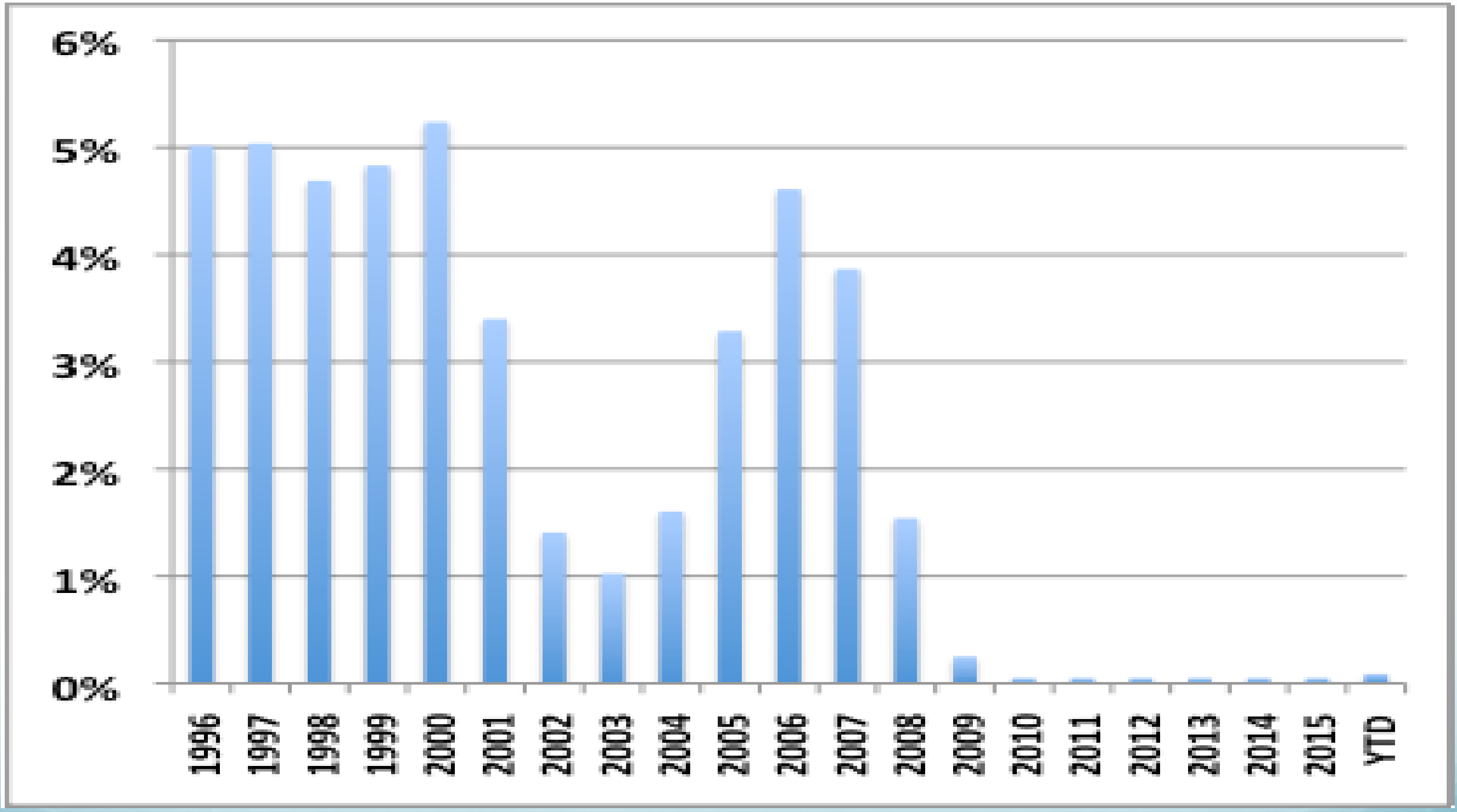
  i.e. stock picking

  <2% Market timing

The Major Asset Classes

- Fixed Income
  - Cash and Cash Equivalents
  - Bonds
- Equities
  - Stocks

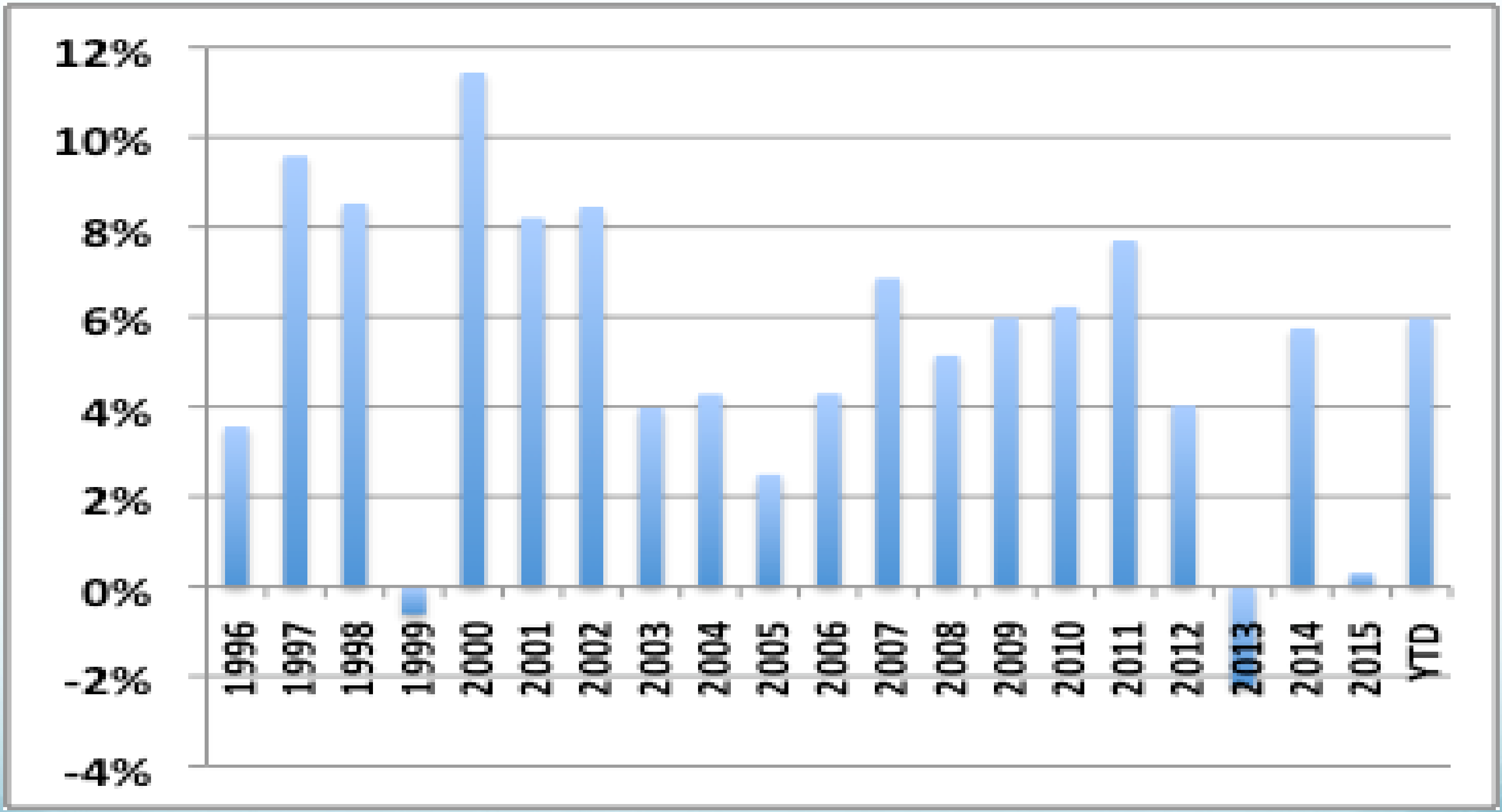
Total Return for 3-MonthT-Bills



Characteristics for Cash and Cash Equivalents

- Low return
  Mean value of total return = 2.3%, CAGR = 2.2%
- Low risk
  Standard deviation = 2.1%
- Sharpe ratio = 0
- Best year: 5.24% (2000)
- Worst year: 0.04% (2014)
- Number of down years: 0/20

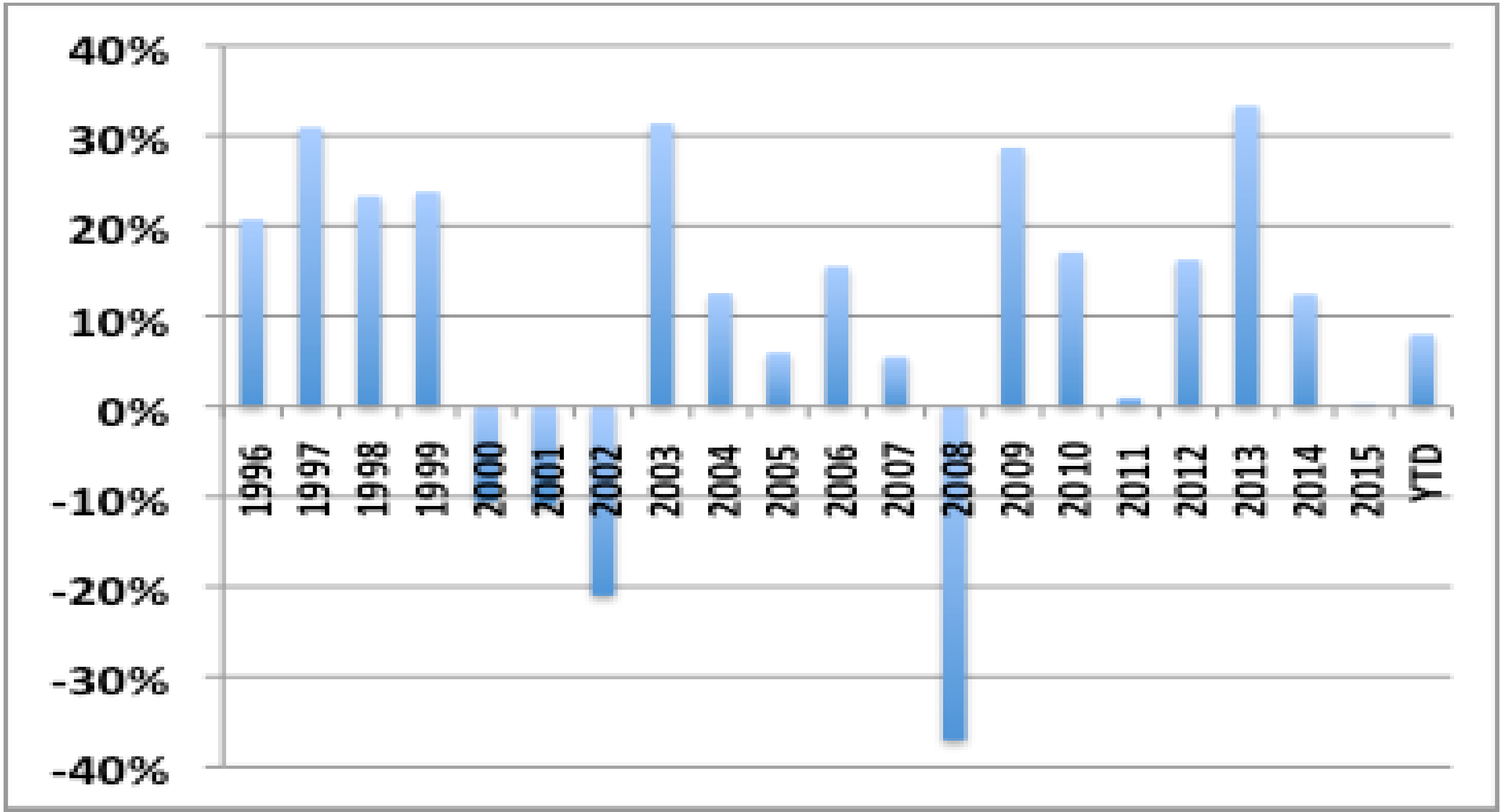
Total Bond Market Fund, VBMFX



Characteristics for Total Bond Market Fund, VBMFX

- **Higher return than cash**
  Mean value of total return = 5.2%, CAGR = 5.1%
- **Higher risk**
  Standard deviation = 3.5%
- **Sharpe ratio = 0.84**
- **Best year: 11.4% (2000)**
- **Worst year: -2.2% (2013)**
- **Number of down years: 2/20 = 10%**

Total Stock Market Fund, VTSMX



Characteristics for Total Stock Market Fund, VTSMX

- Higher return than cash or bonds

  Mean value of total return = 10.0%, CAGR = 8.2%

- Significantly higher risk

  Standard deviation = 18.7%

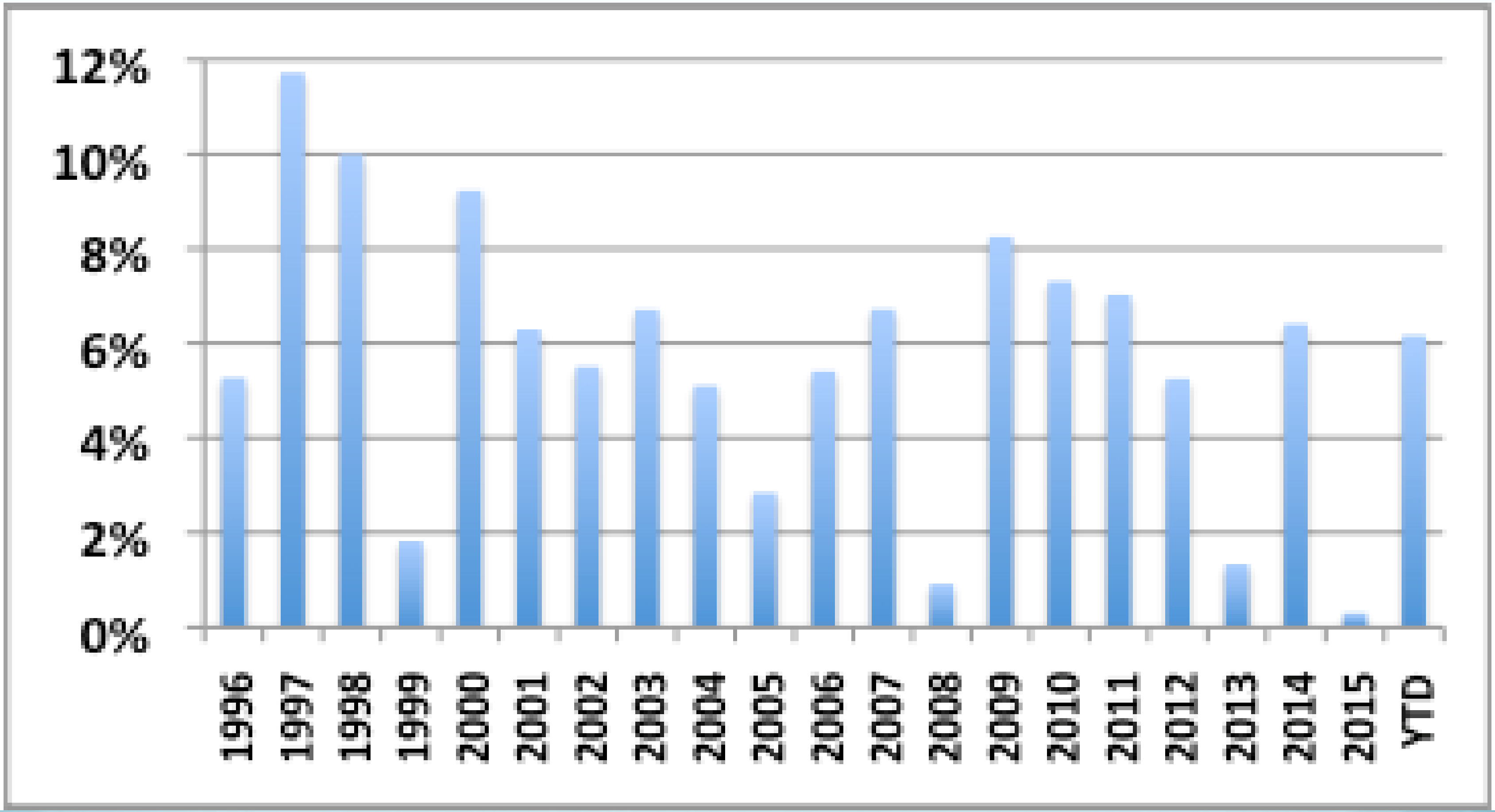
- Sharpe ratio = 0.41
- Best year: 33.3% (2013)
- Worst year: -37.0% (2008)
- Number of down years: 4/20 = 20%

An Experiment: Does The Theory Hold?

- Lets see if we can beat the risk-adjusted performance of the bond fund by blending in a little stock

- Vanguard Total Bond Market Index, VBMFX 90%
- Vanguard Total Stock Fund, VTSMX 10%

Simple 2-Asset Portfolio
90% Bond Fund + 10% Stock Fund



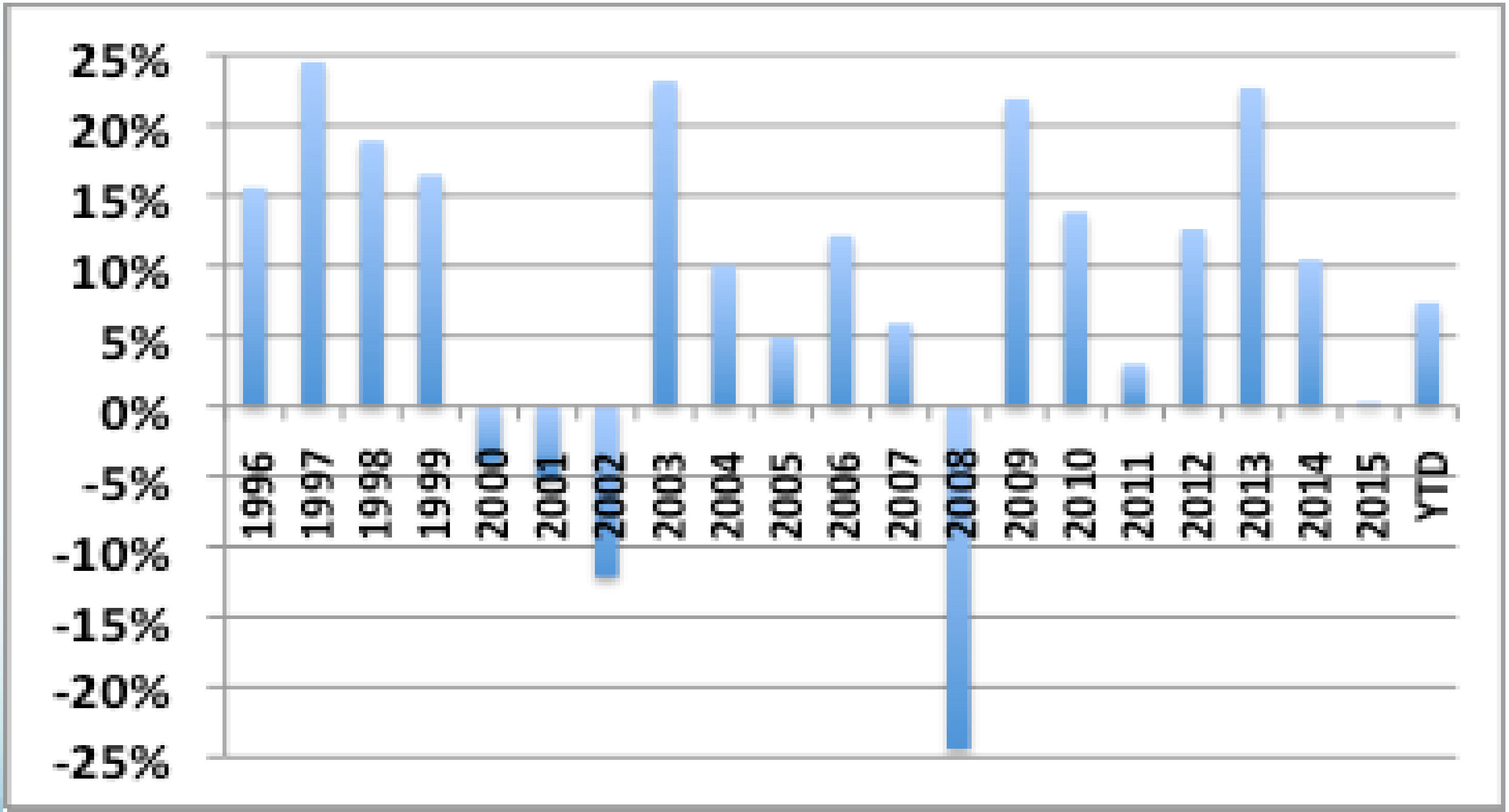
Characteristics for Simple 2-Asset 90%B/10%S Portfolio

	Bond Fund	Stock Fund	Portfolio
Weight	90%	10%	100%
20 year CAGR	5.1%	8.2%	5.6%
Std Deviation	3.5	18.7	3.0
Sharpe Ratio	0.84	0.41	1.11
Best year	11.4%	33.3%	11.7%
Worst year	-2.2%	-37.0%	0.3%
# Down years	2	4	0

Need a higher return?

- What happens if we move farther up the risk curve to a portfolio with 30% fixed income and 70% equities?
- Vanguard Total Bond Market Index, VBMFX 30%
- Vanguard Total Stock Fund, VTSMX 70%

Simple 2-Asset Portfolio
30% Bond Fund + 70% Stock Fund



Characteristics for Simple 2-Asset 30%B/70%S Portfolio

	Bond Fund	Stock Fund	Portfolio
Weight	30%	70%	100%
20yr CAGR	5.1%	8.2%	7.7%
Std Deviation	3.5	18.7	12.8
Sharpe Ratio	0.84	0.41	0.49
Best year	11.4%	33.3%	24.5%
Worst year	-2.2%	-37.0%	-24.4%
# Down years	2	4	4

How Can We Diversify Further?

- Replace Total Stock Market Fund, VTSMX 70%

  with large cap index

  Vanguard 500 Index, VFINX 30%

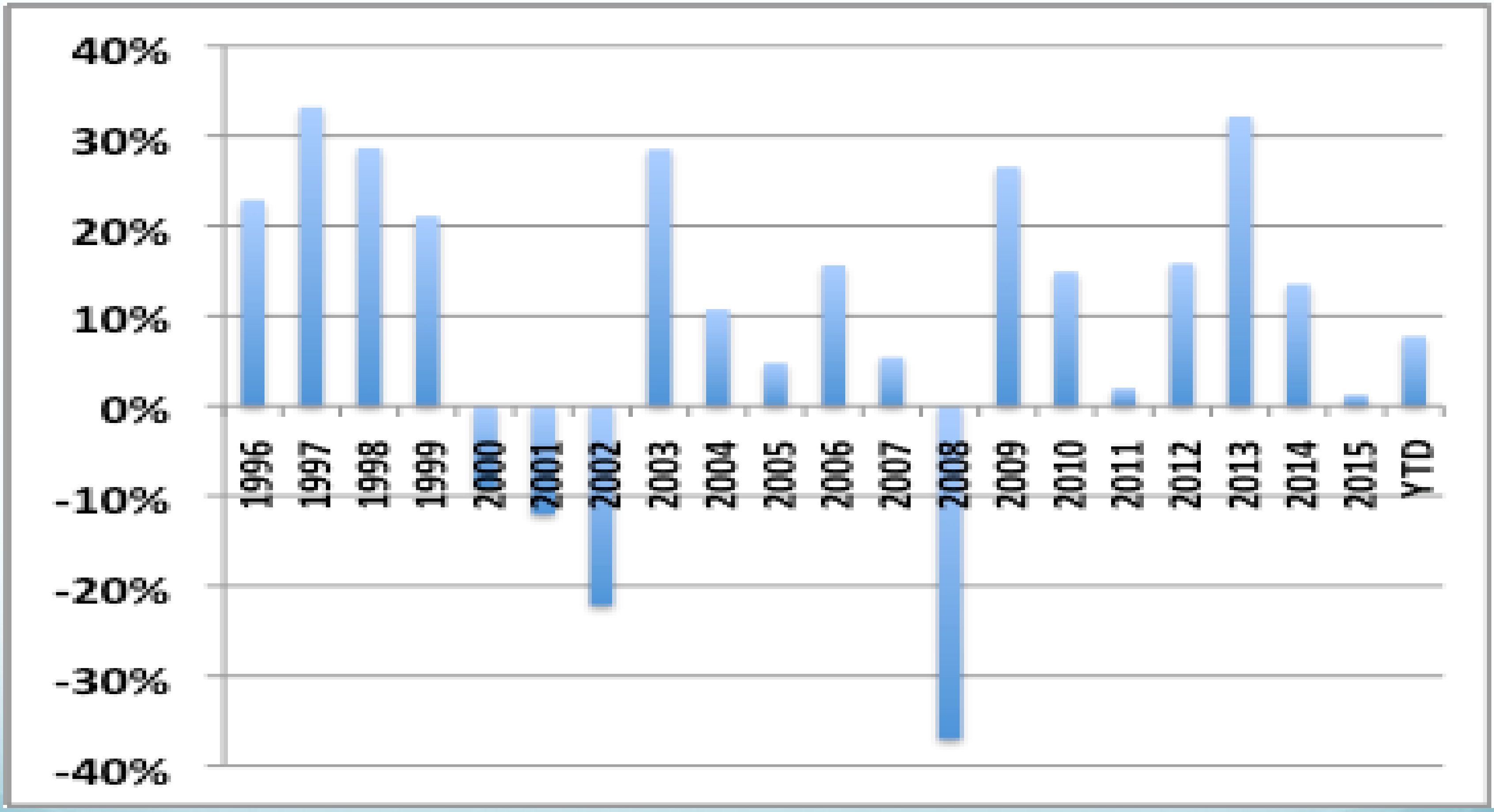
  plus mid and small cap index

  Vanguard Extended Market Index, VEXMX 30%

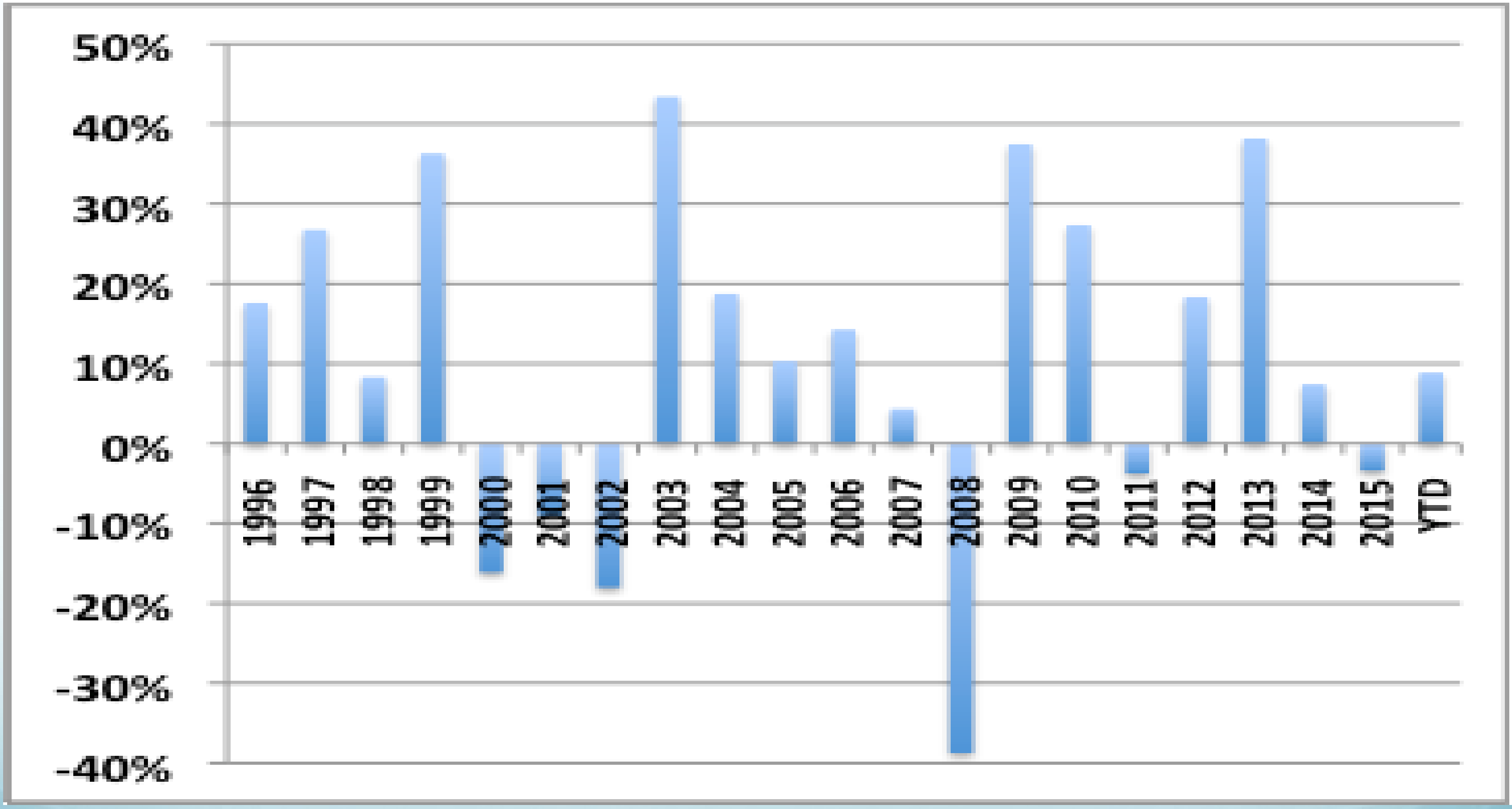
  plus real estate index

  Vanguard REIT Index Fund, VGSIX 10%

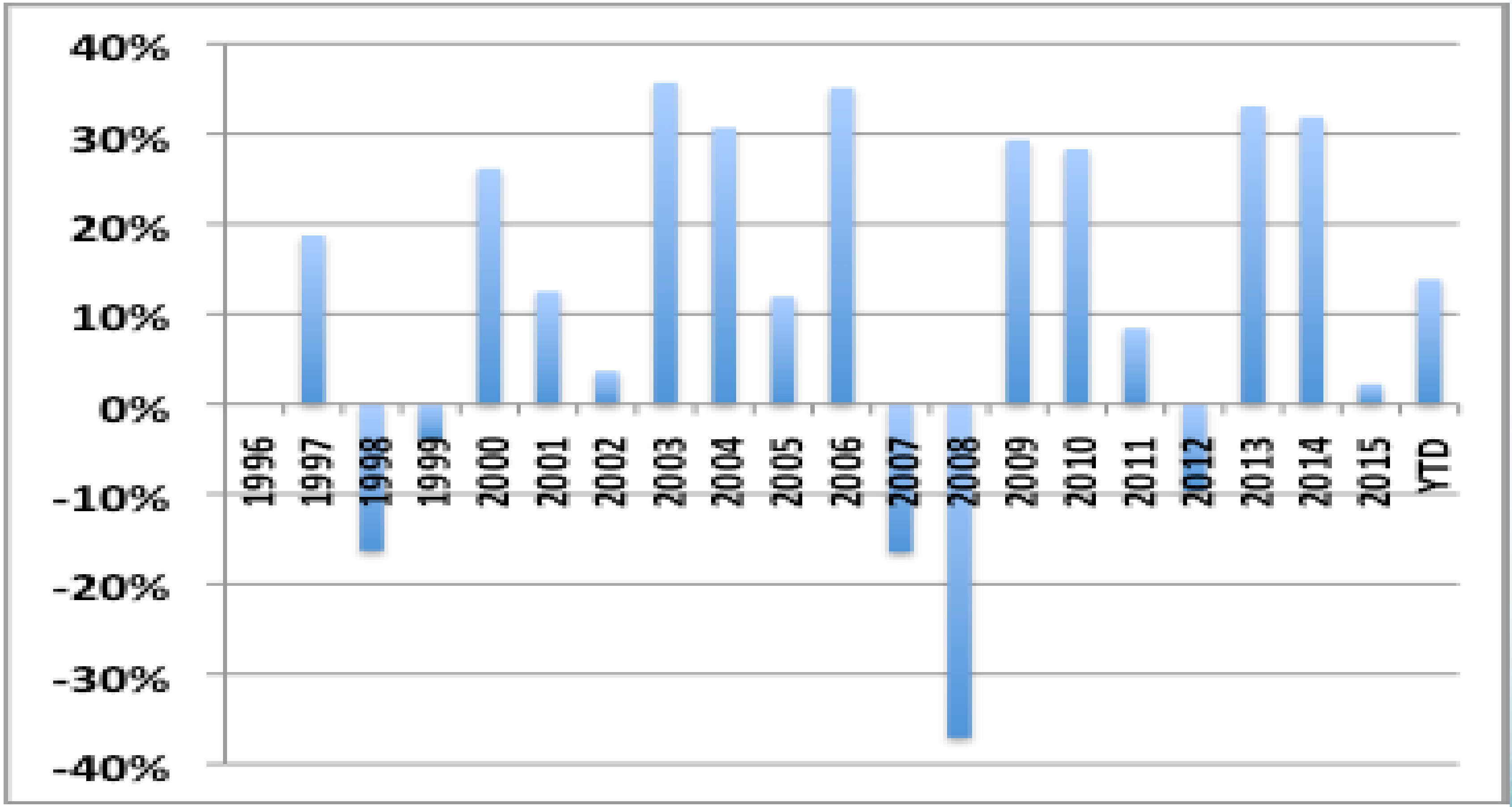
Vanguard 500 Index, VFINX



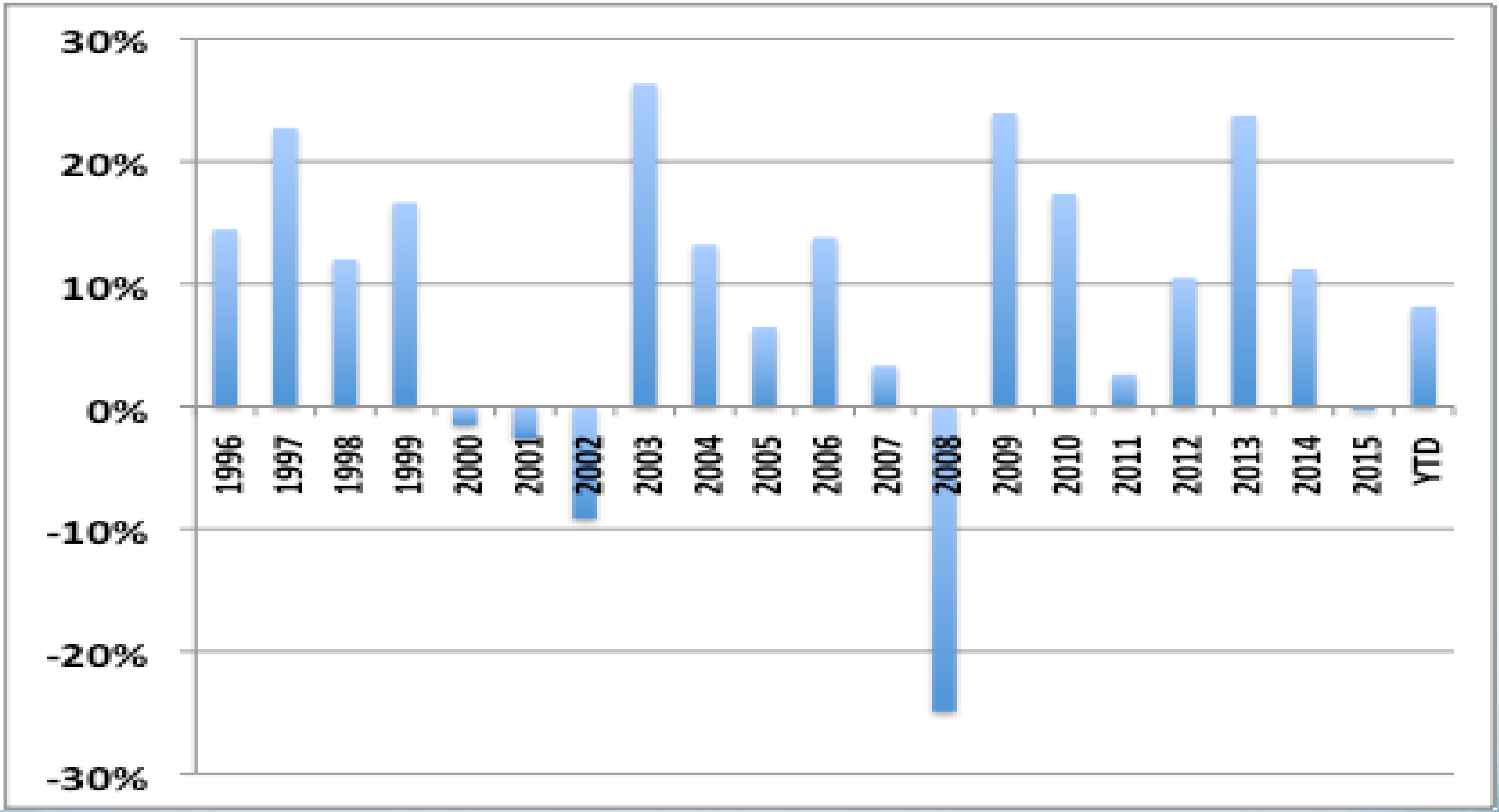
Extended Market Index, VEXMX



REIT Index Fund, VGSIX



Four Asset 30%B/70%S Portfolio



Characteristics of 4-Asset 30%B/70%S Portfolio

	VBMFX	VFINX	VEXMX	VGSIX	Portfolio
Weight	30%	30%	30%	10%	100%
CAGR	5.1%	8.1%	8.8%	9.8%	8.2%
Std. Dev.	3.5%	18.7%	21.5%	20.5%	12.6%
Sharpe	0.84	0.40	0.41	0.47	0.53
Best year	11.4%	33.2%	43.4%	35.7%	26.3%
Worst year	-2.2%	-37.0%	-38.7%	-37.0%	-24.9%
# Down yrs	2/20	4/20	6/20	5/20	5/20

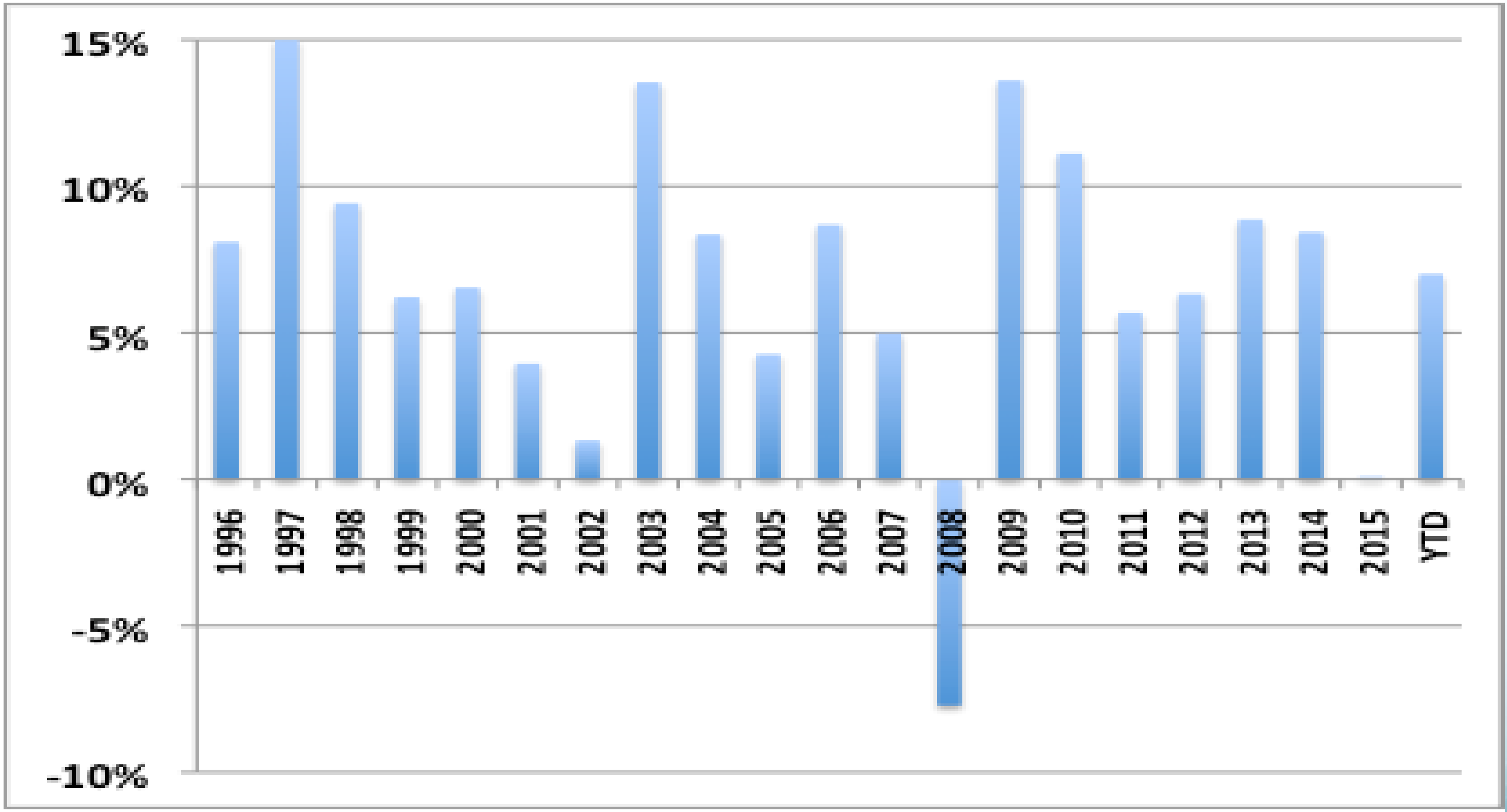
For Those With a Lower Risk Tolerance

- **What if we switch to a 70%B/30%S portfolio?**

i.e. 70% fixed income and 30% equities

Vanguard Total Bond Market Index, VBMX	**70%**
Vanguard 500 Index, VFINX	**12%**
Vanguard Extended Market Index, VEXMX	**12%**
Vanguard REIT Index, VGSIX	**6%**

Four Asset 70%B/30%S Portfolio



Characteristics of 4-Asset 70%B/30%S Portfolio

	VBMFX	VFINX	VEXMX	VGSIX	Portfolio
Weight	70%	12%	12%	6%	100%
CAGR	5.1%	8.1%	8.8%	9.8%	6.7%
Std. Dev.	3.5%	18.7%	21.5%	20.5%	5.2%
Sharpe	0.84	0.40	0.41	0.47	0.88
Best year	11.4%	33.2%	43.4%	35.7%	15.0%
Worst year	-2.2%	-37.0%	-38.7%	-37.0%	-7.7%
# Down yrs	2/20	4/20	6/20	5/20	1/20

Further Diversification

- Fixed Income
  - Short-term, Intermediate term, long-term bonds
  - Municipal bonds, high-yield (junk) bonds
  - International bonds
- Domestic Equities
  - Large cap, mid-cap, small cap stocks
  - Growth, blend, value stocks
- International Equities
  - Developed countries
  - Emerging markets

Correlations of Major Asset Classes 1970-2012 (Craig Israelsen)

	Large US Equity	Small US Equity	Non-US Equity	US Bonds	Cash	REIT
Small US Equity	0.78					
Non-US Equity	0.66	0.55				
US Bonds	0.25	0.11	-0.01			
Cash	0.09	0.05	-0.01	0.26		
REIT	0.51	0.75	0.37	0.05	0.06	
Commod-ities	-0.06	-0.14	0.04	-0.13	0.13	-0.04

The Vanguard "Lazy Portfolios"

	Total Bond Mkt	Total Stk Mkt	Intl Stk Mkt	REIT
Rick Ferri	40%	60%	-	-
Rick Ferri	40%	40%	20%	-
Bill Schulteis	33%	34%	33%	-
Scott Burns	33%	34%	33%	-
Rick Ferri	40%	30%	24%	6%
Bill Schulteis	40%	10+10+10+10%	10%	10%
William Bernstein	40%	15+10+5+10%	5+5+5%	5%
Frank Armstrong	30%	7+9+6+9%	31%	8%
David Swensen	15 + 15%	30%	15 + 10%	15%

A Really Cheap 6-Asset Portfolio: Matt Hougan’s 8-bp ETF Portfolio

	Exp. Ratio
40% Schwab U.S. Broad Equity, SCHB	0.04%
30% Schwab International Equity, SCHF	0.08%
5% Schwab Emerg. Markets Equity, SCHE	0.14%
15% Schwab U.S. Aggregate Bond, SCHZ	0.06%
5% Schwab U.S. REIT, SCHH	0.07%
5% UBS … Commodity ETN, DJCI	0.50%

Craig Israelsen's 7Twelve Portfolio

- Equal 8.3% weighting of 12 assets in 7 classes
  - US Stock: Large cap, Mid cap, Small cap
  - Non-US Stock: Developed stock, Emerging stock
  - Real Estate
  - Resources: Natural resources, Commodities
  - US Bonds, Inflation protected bonds
  - Non-US Bonds
  - Cash

Sample of Index Funds Available

	Mutual Funds	ETFs
Total Bond Funds	VBMFX	BND, SCHZ, IUSB
Total US Stock Funds	VTSMX	VTI, ITOT, SCHB
Total Intl. Stock Funds	VGTSX	VXUS, EFA, SCHF
REIT Index Funds	VGSIX	VNQ, IYR, SCHH
Commodities	PRNEX	DJCI, IGE, GCC

To Keep It Really Simple! One-Fund Portfolios

- Balanced Funds
  - Vanguard STAR Fund, VGSTX

    Approx 37% Bonds, 44% US Stocks, 19% Intl. Stocks

CAGR (20 yrs)	7.9%
Std.Deviation	11.5%
Sharpe Ratio	0.56
Best year	24.9%
Worst year	-25.0%
# Down years	3/20 = 15%

Another One-Fund Solution
Target Date Funds

Allocation automatically becomes more conservative as you approach retirement age

Average % allocations of 10 largest funds:

	2020	2025	2030	2035	2040	2045	2050
Stocks	57%	66%	74%	80%	84%	85%	85%
Bond	36%	27%	20%	13%	10%	9%	9%
Cash	7%	7%	6%	6%	6%	6%	6%

Vanguard Target Retirement Funds

Fidelity Freedom K Funds

T Rowe Price Target Retirement Funds

plus Alliance, PIMCO, Schwab, ING, etc., etc.

Rebalancing Your Portfolio

- **Rebalancing is necessary to reduce risk**
- **Most helpful when it is most difficult**
  - Opposite of "Feed the winners and starve the losers"
- **Periodic or calendar driven:** Rebalance annually
  - Rebalancing more often is not useful
- **Threshold or data driven:** Rebalance as necessary
  - Check monthly or quarterly, but only rebalance when an actual asset allocation deviates from its strategic value by more than a predetermined amount, say 10% of the strategic value.

Practical Aspects of Rebalancing

- Use cash flows into or out of portfolio to rebalance

    e.g. monthly contributions, RMDs, etc.

- Do not reinvest dividend distributions

    Let dividends accumulate in money market account; then use this to make rebalancing purchases

- Many retirement plans offer automatic rebalancing

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- Modern Portfolio Theory
- Characteristics of asset classes
- Building and rebalancing your portfolio
- >>> Your Investment Policy Statement

The Investment Policy Statement

- Written agreement between the portfolio manager and client
- Outlines the general philosophy and objectives for managing the portfolio
- Summarizes who you are from your PIP

  Example: Long-term investor with moderately conservative risk tolerance
- Sets the rules and limitations.

Your IPS: Asset Allocation Policy

- Document your broad strategic asset allocation

Example:

Example:	Cash and cash equivalents	5%
	Fixed income	25%
	U.S. Equities	60%
	International stocks	10%

- Diversify within asset classes
- Range for tactical allocation, if allowed

  Example: May deviate +/- 30% from strategic values as market conditions dictate

- Should not call out specific securities.

Your IPS: Rebalancing Strategy

- Rebalancing strategy:
  - Example: Monitor asset allocation quarterly

    Rebalance if any allocation deviates from its target value by >10%

Your IPS: Prohibitions (if any)

- Possible prohibition examples:
  - No single security >5% of total portfolio
  - No buying securities on margin
  - No short sales
  - No derivatives
  - No securities from French West Africa
  - No alcohol/tobacco stocks

Can you summarize your IPS in 10 words? Short Investing Philosophies

- “If everyone wants it, I don’t. Avoid crowds”
  Gus Sauter, The Vanguard Group
- “Control what you can: your savings rate, costs, and taxes”
  Don Phillips, Morningstar
- “Other people are smarter than you think they are. Index”
  Lawrence Siegel, CFA Institute
- “Are you smarter than the average professional investor? Probably not” William Sharpe, Nobel Laureate
- “Build a diversified portfolio of cheap index funds; Rebalance diligently” FS

Rick Ferri's
6 Rules for Disciplined Investing

1. **Have a long-term investment philosophy.**
2. **Form a prudent asset allocation based on this philosophy.**
3. **Select low-cost funds to represent asset classes in the allocation.**
4. **Maintain this portfolio through all market conditions.**
5. **Don't change the asset allocation due to recent market activity.**
6. **Don't hold back on new investments while waiting for market clarity.**

In Summary

- Today we covered
  - Modern Portfolio Theory
  - Characteristics of asset classes
  - Building and rebalancing your portfolio
  - Your Investment Policy Statement

Next Month We Will Cover …

Introduction to Computerized Investing

Guest speaker: Allan Zmyslowski

- Websites and Spreadsheets
  Top sites and useful tools

- Santa Clara County Library data sources
  Morningstar, S & P, Value Line; how to use them

- Asset allocation, ETFs and Roboadvisors
  How these work separately … and together

Before Next Month's Workshop …

- Review your PIP from last month and revise it if necessary
- Write your Investment Policy Statement, IPS, and add it to your "All About Me" folder
- Remember:

If it isn't written down it never happened!

To Probe Further

- The Importance of Diversification in Retirement Portfolios, Craig Israelsen, AAII Journal, April 2015
- The Benefits of Diversification, Jeremy Stempien, Morningstar magazine, April/May 2015
- The Advantages of Simple Allocation Strategies, Wesley Gray, AAII Journal, November 2015
- Choosing the Right Portfolio Allocation Approach for You, Charles Rotblut, AAII Journal, October 2014
- Portfolio Selection, Harry Markowitz, Journal of Finance, 1952
- Determinants of Portfolio Performance, Gary Brinson, Randolf Hood and Gilbert Beewater, Financial Analysts Journal, July/August 1986 and May/June 1991
- Best Practices for Portfolio Rebalancing, Colleen Jaconetti, Francis Kinniry, and Yan Zilbering, AAII Journal, May 2011
- Should you rebalance your portfolio? Consumer Reports Money Adviser, March 2015
- Defining Your Investment Philosophy, Ben Carlson, AAII Journal, Nov. 2015

Useful Websites

- www.aaii.com Broad selection of investing material
- www.santaclaracountylib.org/Adults/Business & Money
  - Morningstar Investment Research Center
  - Standard & Poors NetAdvantage
  - Value Line
- www.vanguard.com www.fidelity.com
- www.schwab.com www.tdameritrade.com
- www.bogelheads.com Lazy Portfolio data
- www.7TwelvePortfolio.com Craig Israelsen's portfolio
- www.rickferri.com Rick Ferri blog
- www.obvliviousinvestor.com Mike Piper blog

Lighthearted Food for Thought ..…
The Motley Fool's Financial Rules

- Imagine all the stuff you'd have to make up if you were forced to talk 24/7. Remember this when watching financial news on TV.
- Don't let Washington sway your investment decisions. Congress has been a dysfunctional swamp of disappointment since 1789, and stocks have done well ever since.
- The role of stock forecasters is to make fortune tellers look good. Warren Buffet
- The correlation between confidence and future regret is incredibly high.

Don't Listen to the Talking Heads!