YALE
UNDERGRADUATE
DIVERSIFIED
INVESTMENTS

Meeting # 2

Portfolio Construction and Management

November 13 9 Pm LC 101

Educational Meetings: Course Outline

FALL 2014

OCTOBER

- Introduction to Basic Concepts of Finance

NOVEMBER

- Portfolio Construction and Management
- Economy Sectors and Companies

SPRING 2015

JANUARY

- Developing Investment Strategy
- Interpreting SEC Filings

FEBRUARY

- Fundamental vs Technical Analysis
- Discounted Cash Flow

MARCH

- Deeper Understanding of Technical Analysis

APRIL

- Investing in Diversified Markets and Understanding Advanced Techniques
- Managing money and expectations

Today's Outline:
Building and Maintaining a Portfolio

1. Risk Tolerance

2. Asset Allocation

3. Diversification

4. Portfolio Management

1. Risk Tolerance

What Comes First?

Assessing your Risk Tolerance

OR

Top Down Approach Analysis

Risk Assessment

- Assess your risk tolerance first
- Know your risk tolerance BEFORE you think about constructing a portfolio
- Helps you understand your goals
  - What types of investments you want
  - What type of investing strategy you will use

What is Risk?

- Risk is defined as the likelihood of a bad outcome

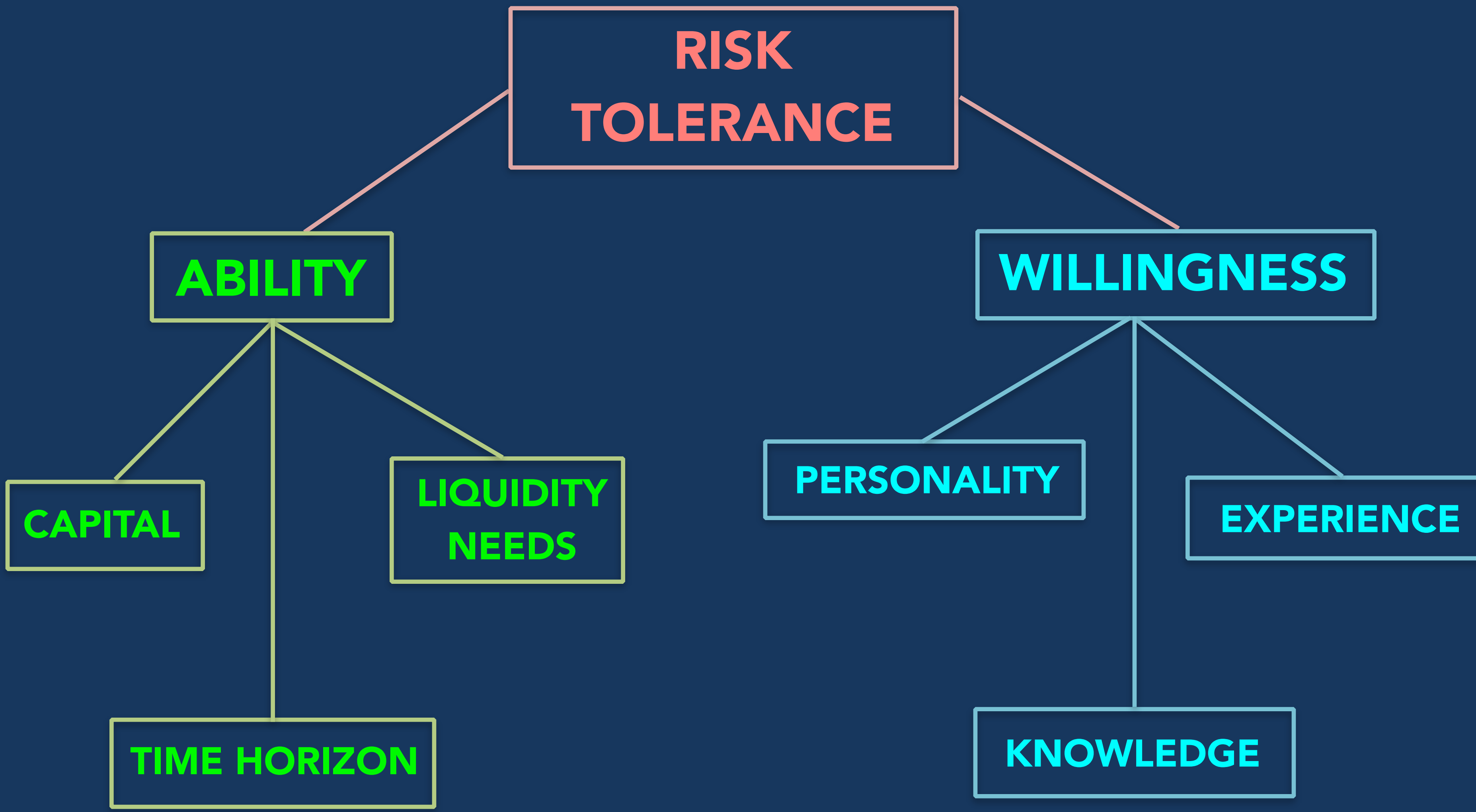
- In investing, this bad outcome is losing money

- For us (during the competition) the bad outcome is your investing portfolio losing value

Determining Risk Tolerance

- All investors must address this question before investing
- Assessing risk tolerance is like making a strategy
- Risk within a portfolio can range from low to high
    - low risk = conservative
    - high risk = aggressive

How Risk Tolerance is Determined?



What increases your risk tolerance?

ABILITY

- When you have a lot of capital (money)
- When you are young and have time to recoup your losses
- When you have low liquidity needs (don't need your money right away)

WILLINGNESS

- When you are a naturally risky person
  - You like to gamble and take chances
- When you have extensive knowledge and experience in investing
- When you know how financial markets work and react

Helpful Ways to Address Risk

Risk Tolerance Quizzes

- Example: the Vanguard risk tolerance quiz (linked below)
  - https://personal.vanguard.com/us/FundsInvQuestionnaire

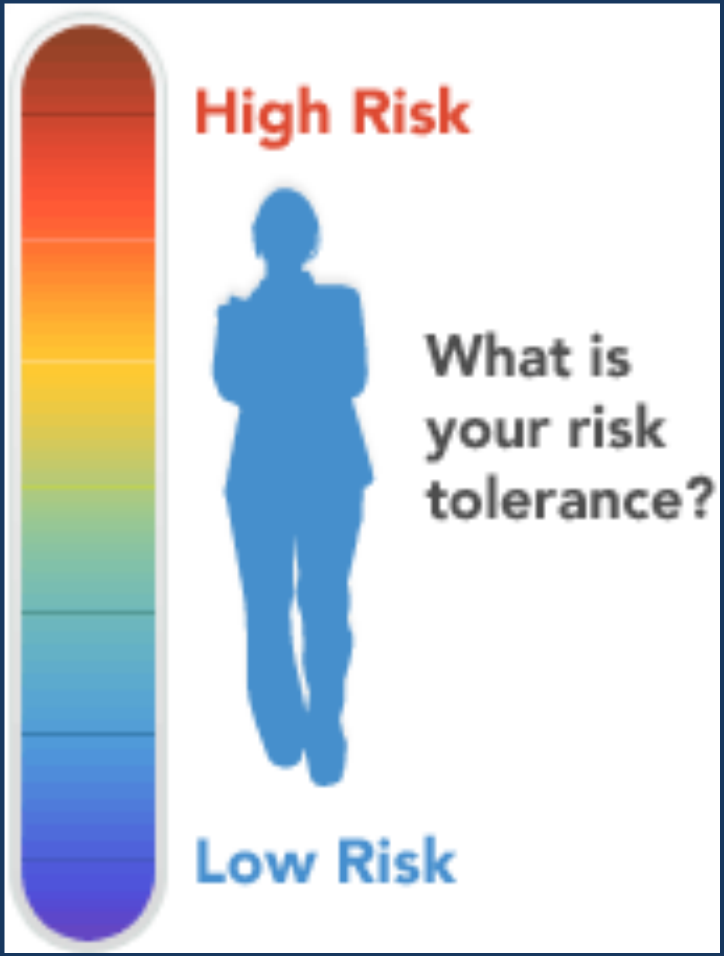
5-10 Projection

- What do you want your portfolio to look like in 5-10 years
- Use this projection to define your risk level

110 Rule

- Subtract your age from 110
- This value is the percentage of equities in your portfolio
- Most risky strategy

How risky should YUDI Members be?



YUDI Members' Risk Tolerance

ABILITY

- **Age**
  - Pretty young
  - 110 rule —> roughly 90% of our portfolios should be in equities
- **Investment Horizon**
  - Ambitious aspirations
  - High chance of landing above average paying jobs
  - Steady income is very helpful in sustaining more risky profiles
- **Life stage**
  - Still very early and have lots of time to recover from potential short term losses
- **Liquidity Needs**
  - None; we can invest all of our cash if we want
- **Capital**
  - Most likely be starting the competition with $100,000 (which is a lot of money!)

WILLINGNESS

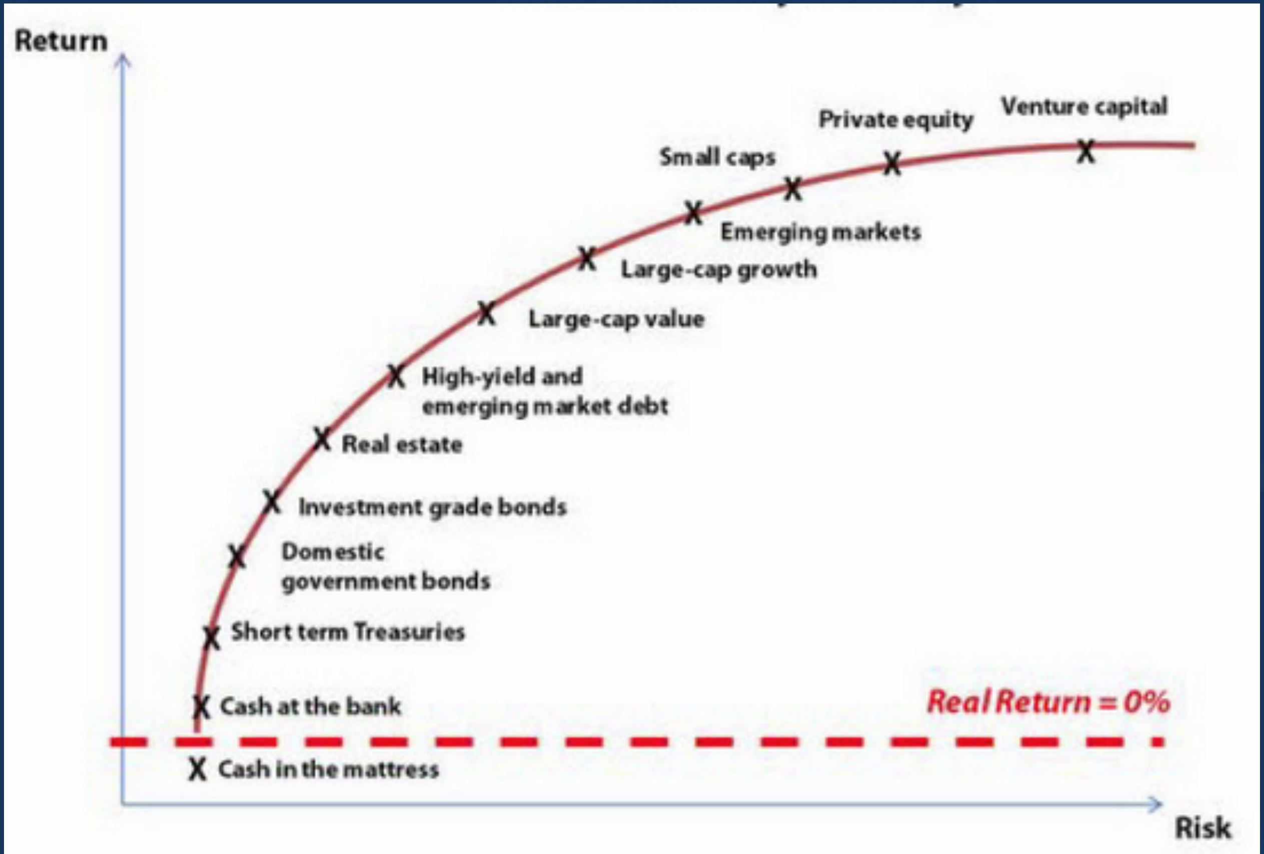
- **Personality**
  - Will vary among individuals
  - Will vary among teams
- **Knowledge**
  - Will vary among individuals
  - Will vary among teams
- **Experience**
  - Will vary among individuals
  - Will vary among teams

***At this point in your life, conditions stipulate that you can afford a HIGH RISK TOLERANCE**

*** For the competition next semester, we hope to see aggressive strategies that show this!**

2. Asset Allocation

Asset Allocation



- When purchasing assets, you are assuming a certain combination of risk and return
- Historically, different assets correlate to specific risk and return profiles

"BIG THREE" ASSETS

LOW RISK

CASH

- Checking and saving accounts

- US Treasury Bills

LOW-MED RISK

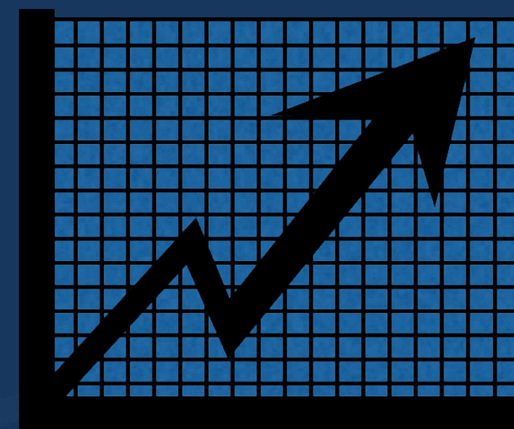
FIXED INCOME (bonds)

- Government

- Corporate

- Municipalities

HIGH RISK

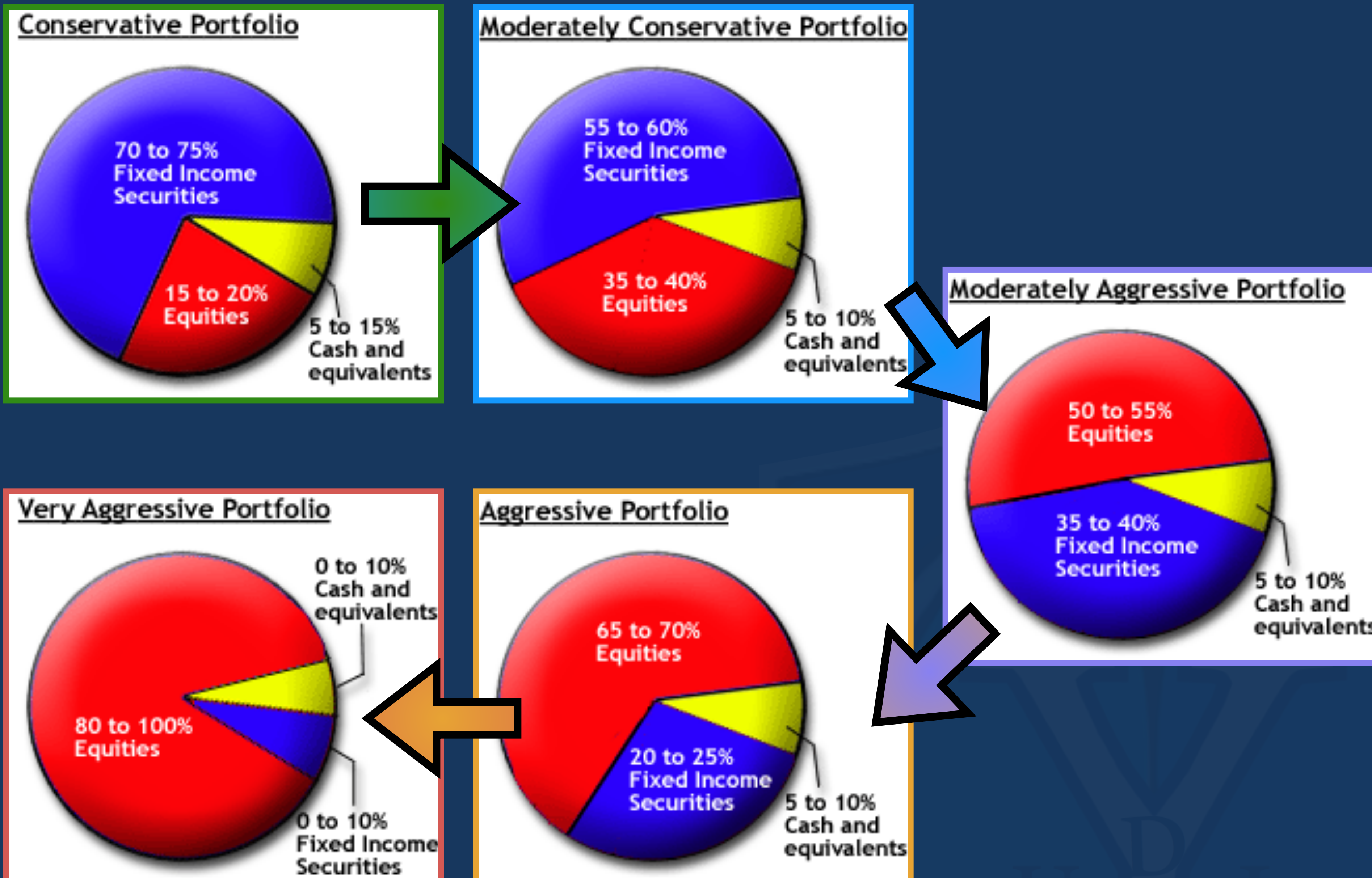


EQUITY (stocks)

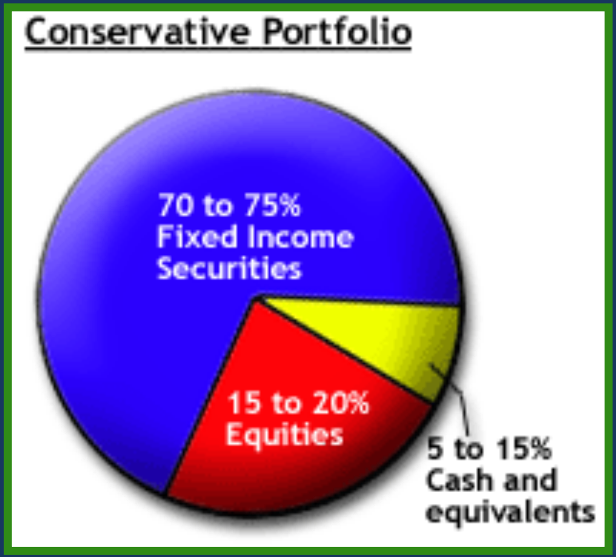
- Company shares

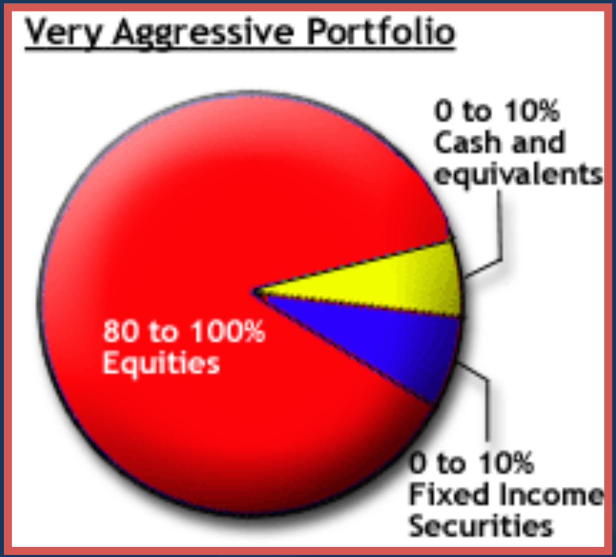
- Shares = part ownership of company

Big Three Allocation Examples Based off Risk Tolerance



ASSET COMBINATIONS





- Your risk preferences dictate your asset allocation
- The riskier you are (right portfolio), the more you'll invest into stocks
- The less riskier you are (left portfolio), the more you'll invest into bonds and cash

Examples of Risk Tolerance

- **LOW-** Grandfather age 70, hoping to live out a basic comfortable life. No need to be risky, just preserve past earnings with small growth

- **MEDIUM-** Middle aged husband with a solid income. Has three kids who will go to college. Medium risk, still wants considerable growth, but not at the expense of losing a lot of value

- **HIGH-** Recent college grad with MBA working in the financial field. Great future prospects and a young age mean that this person can be very aggressive since s/he has time to recover from potential losses

3. Diversification

Goal of Diversification

The goal of diversification is thus to minimize the risk for a given expected return.

What is "idiosyncratic risk?"

- Idiosyncratic risk is the standard deviation
- Minimizing idiosyncratic risk = lowering the standard deviation

How do we minimize it?

- Through diversifying across and within asset classes

Diversification

Why should we diversify a portfolio?

- 100% confidence → invest into a single asset
- Not 100% → spread wealth among sectors

Hedge against underperforming sectors

- One portion of portfolio down, all else is up

Worst case scenario: mild loss (<10% value)

Best case scenario: mild to moderate gain (=>10% value)

Diminishing Return

- Law of diminishing returns applies to diversification
  - Depending on capital, investing in 30+ assets will diminish your gains
- Working backwards:
  1. Determine your desired capital gain
  2. Determine average percent gain per investment
  3. Calculate starting capital available
  4. You now know how many average investments you must make to yield desired capital gain

Why Should we Diversify?

- Hypothetical: if you know APPL is going to double in the next year, why not invest all capital into APPL?
  - If we knew this information, it would be insider trading!
- “Diversification is protection against ignorance, it makes little sense if you know what you’re doing”- Warren Buffet
  - Diversification helps prevent loss due to wrong predictions
  - Limits capital gains, but prevents major losses
  - More diversification will:
    - Prevent losses better
    - Prevent major capital gain

Shifting Diversification

- Diversification can reflect the economy growth
- Shift between these depending on sector perspective
  - Fully diversified
  - Semi diversified
  - No diversification
- Diversify portfolio if sectors are doing good/ stable in a poor economy
- Do not diversify portfolios if sectors are stagnant in booming economy/depreciating

Example of Diversification

5 diversified Stocks

$100 each = $500 total

$120 each = $600 total

20%

Scenario 1: They each increase 20%.

Example of Diversification

1 stock

$500

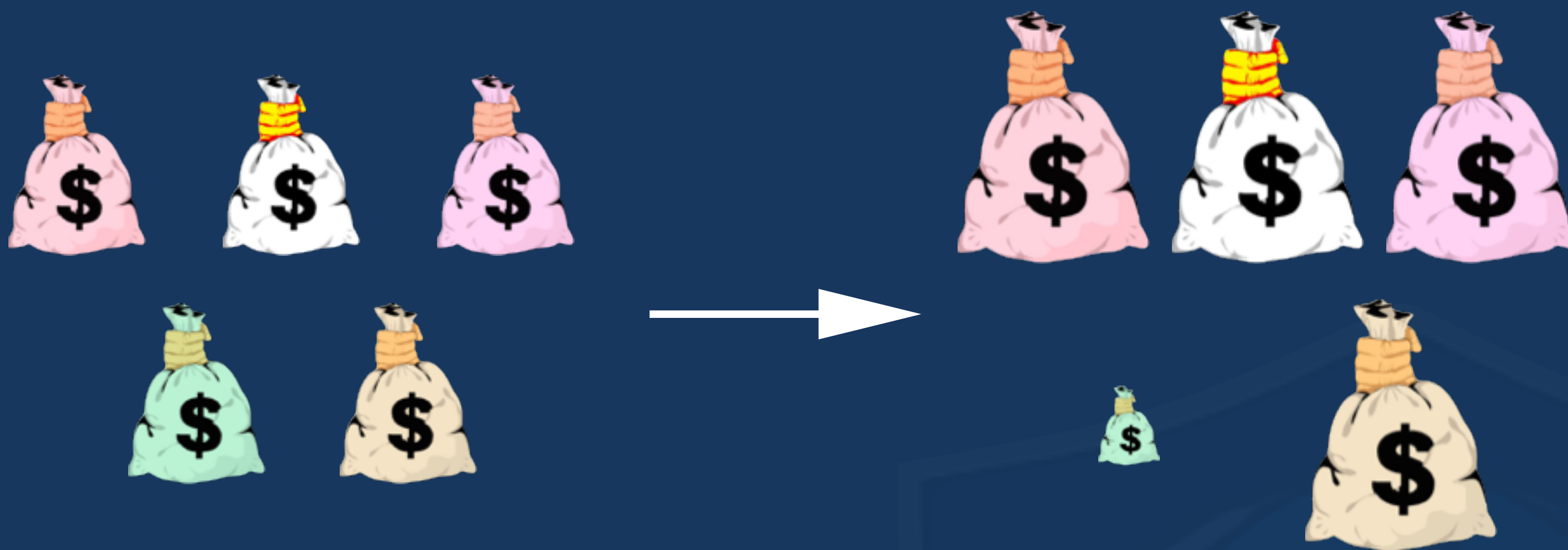
$600

20%

Scenario 1: The green stock increases by 20%.

Example of Diversification

5 diversified Stocks



$100 each = $500 total

$450 total

10%

Scenario 2: Green sector has a bad year, decreases by 50% and others stay fixed.

Example of Diversification

1 stock

$500

$250

Scenario 2: The green stock decreases by 50%.

50%

4. Portfolio Management

Portfolio Management

What is it?

- art and science of making investment decisions about investment mix and policy
- matching investments to objectives
- asset allocation for individuals and institutions
- and balancing risk against performance

Portfolio Management

- portfolio needs regular maintenance

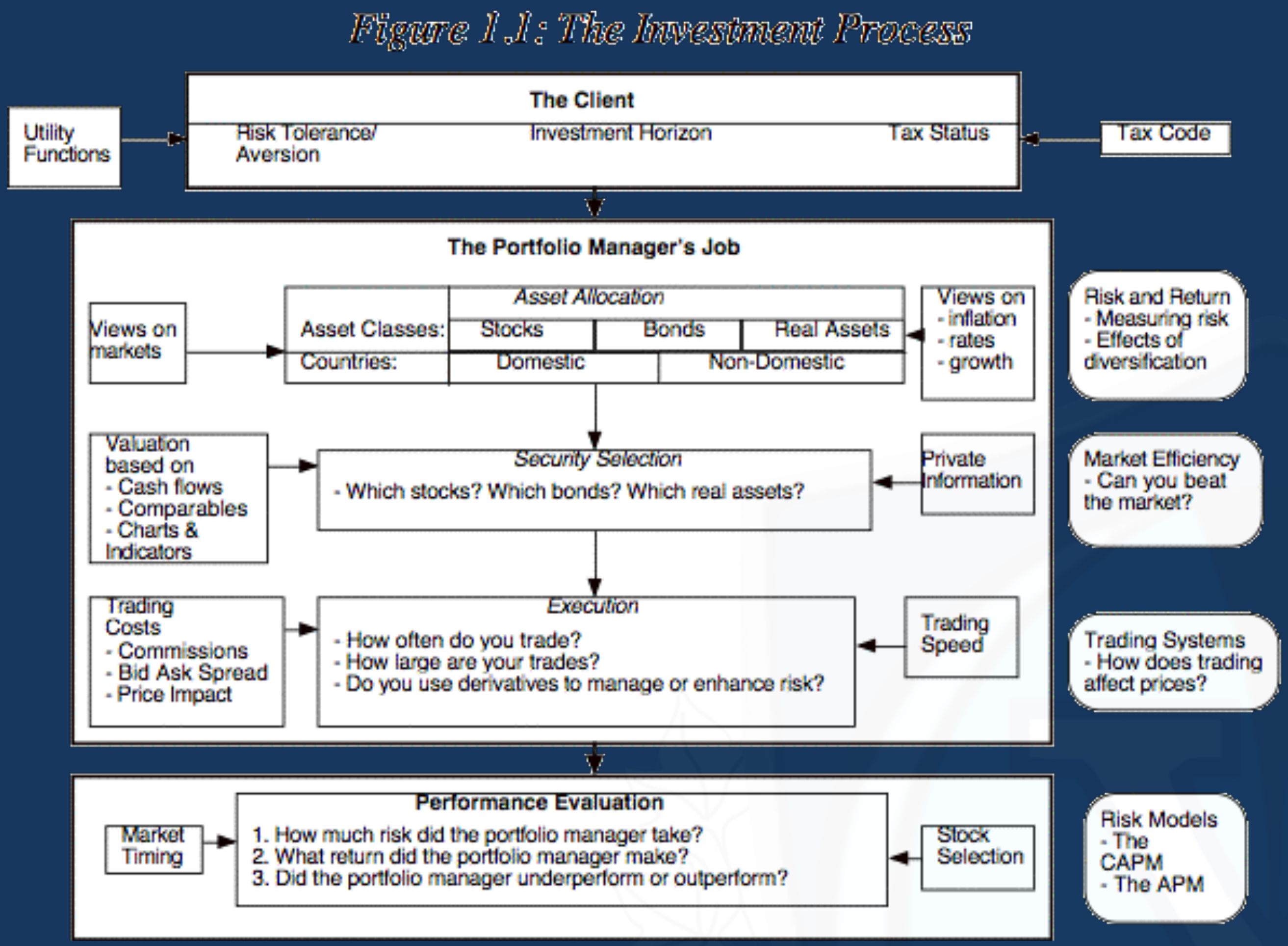
- if not maintained, your portfolio will break down and you can lose money

- how do you keep your portfolio healthy?

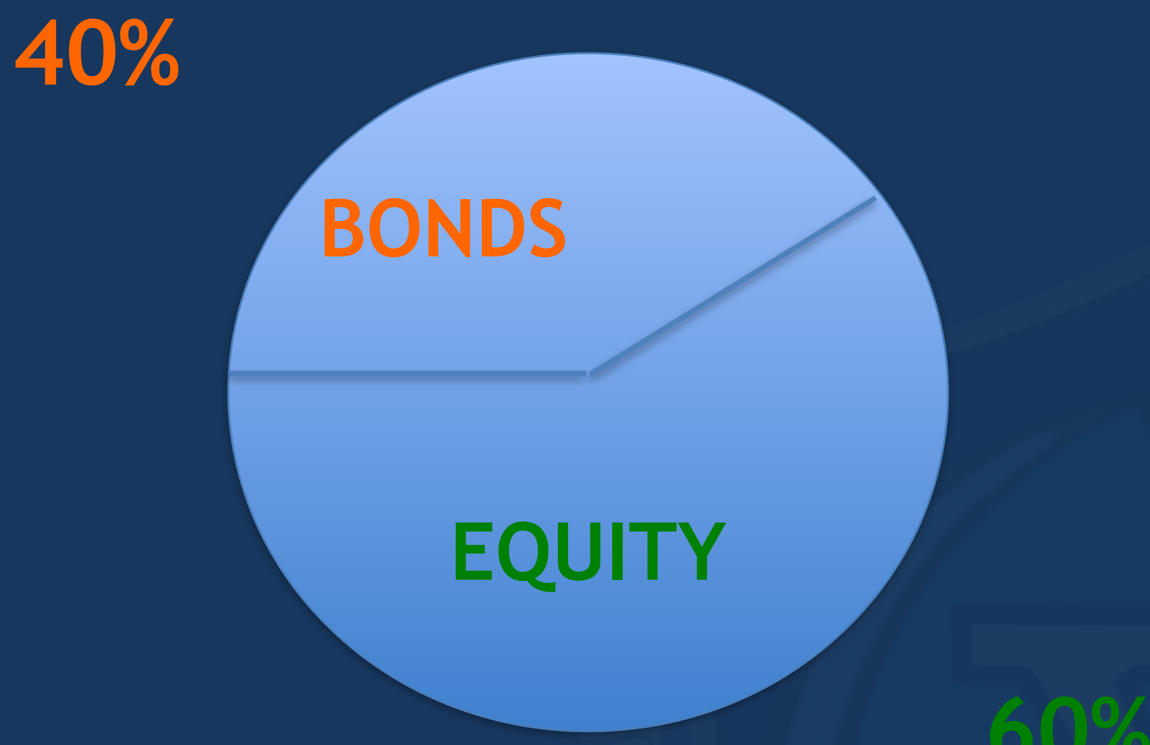
  - derive a target portfolio allocation

  - rebalance portfolio to maintain this allocation

Deriving your Optimal Portfolio



Your Derived Target Portfolio



Maintaining Your Target Portfolio

- idea of portfolio management is simple and beneficial
  - Want keep your asset allocations at their desired levels
    - **60% equity/ 40% bonds**
  - If your asset allocations strays from their targets i.e. 80% equity / 20% bonds?
    - **REBALANCE your portfolio**

Portfolio Rebalancing

What is it?

- the process of realigning the weightings of your portfolio

How do you do it?

- through buying and selling of assets

Why do you do it?

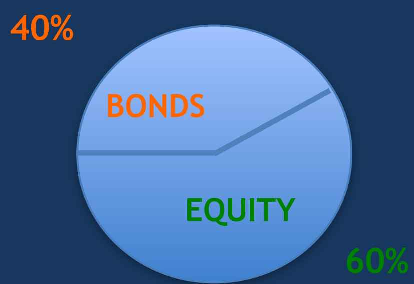
- to bring your asset allocation back to its target level

When should you do it?

- quarterly, semi-annually, or annually
- OR when allocations are greater than 10% from target values

Example of Rebalancing

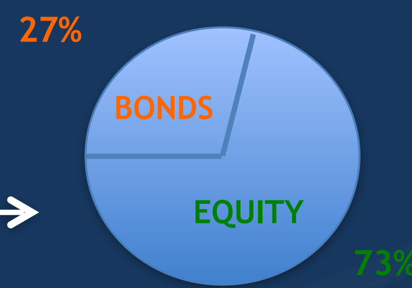
- Say we start with $100,000
- Our target portfolio is 40% bonds, 60% equity
  - derived from Top-Down Analysis



$40,000 Bonds = 40%
$60,000 Equity = 60%
$100,000 Total = 100%

Stock Market Boom!
following occurs:

1. equity holdings appreciate in value
2. value of your bonds go down



$30,000 Bonds = 27 %
$80,000 Equity = 73%
$110,000 Total = 100%

Effects?

1. Asset allocations have strayed their target
2. Greater than 10% from the target

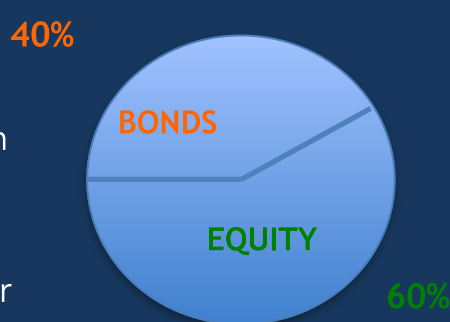
REBALANCE!

REBALANCING

- We want to reach our target allocations again (60/40)

How do we do this?

- sell some equity and/or purchase more bonds



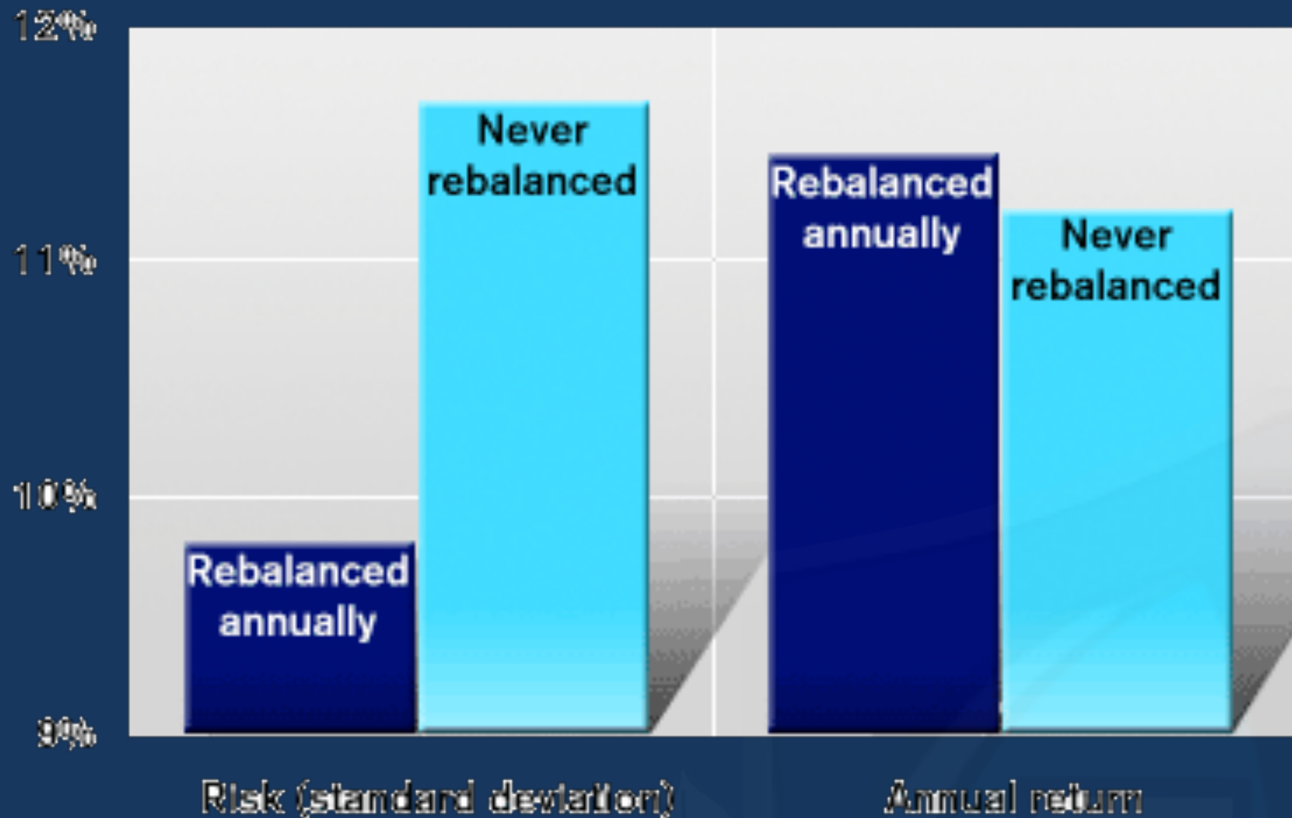
Many ways to rebalance

- sell only equity (giving us more cash)
- only purchase bonds
- combination of the two: sell some equity and purchase

One option?

- sell equity and buy bonds
- sell 13% of our equity shares and purchase 13% more of bonds
- now back to our desired allocation

Benefits of Portfolio Rebalancing



- Rebalancing on a regular balance increases your returns while minimizing your risks

Benefits of Portfolio Rebalancing

Main benefit?

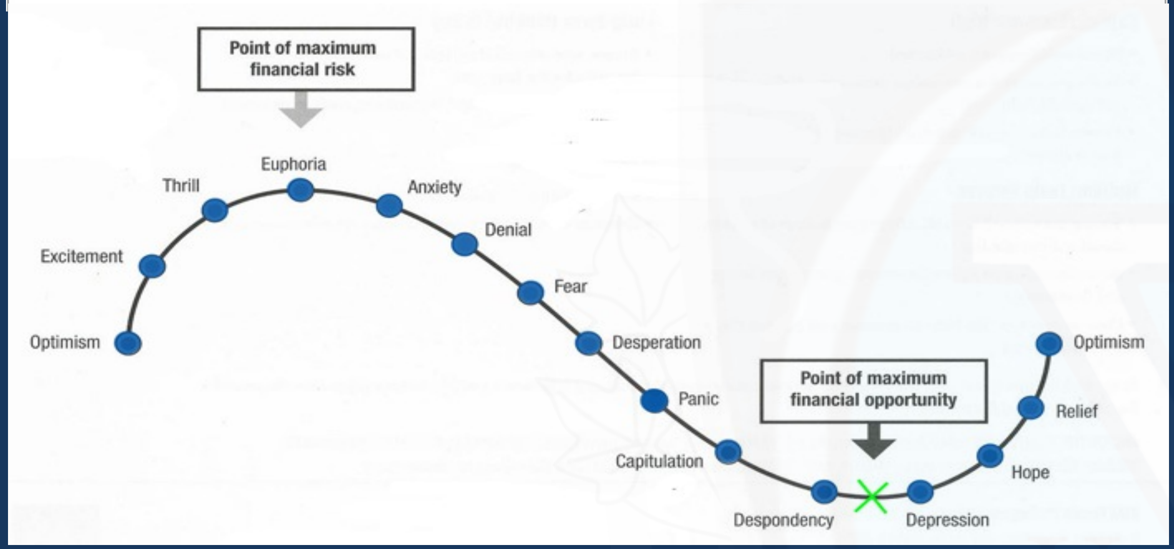
- increases returns while minimizing risk

Why does this happen?

- rebalancing keeps you at your desired risk exposure

- forces you to sell high and buy low
  - many investors do not do this, which is bad

Why do Investors Fall Victim to Animal Spirits?



Investing, Animal Spirits, Portfolio Rebalancing

- investors fall victim to animal spirits due to human nature
  - they buy at the peak of the business cycle and sell at the trough

- portfolio rebalancing prevents this mistake

- rebalancing forces you to
  - sell a stock that has increased in value
  - buy a stock that has decreased in value

Benefits of Portfolio Rebalancing:

Graphical Evidence (I)

- contractions are bad for the economy, but good for investors
- opportunity to make a lot of money
- 2008 mortgage crisis; would have made a fortune if you bought into the market
- everything has ups and downs: its all a big BUSINESS CYCLE

Benefits of Portfolio Rebalancing:

Graphical Evidence (II)

- critical points: peaks and troughs
- peaks indicated by RED
- troughs indicated by GREEN
- should rebalance portfolio at both peaks and troughs

data from the S&P since it's establishment

The Yale Endowment:

Investment Philosophy

Yale's portfolio is structured using a combination of academic theory and informed market judgment. The theoretical framework relies on mean-variance analysis, an approach developed by Nobel laureates James Tobin and Harry Markowitz, both of whom conducted work on this important portfolio management tool at Yale's Cowles Foundation. Using statistical techniques to combine expected returns, variances, and covariances of investment assets, Yale employs mean-variance analysis to estimate expected risk and return profiles of various asset allocation alternatives and to test sensitivity of results to changes in input assumptions.

Because investment management involves as much art as science, qualitative considerations play an extremely important role in portfolio decisions. The definition of an asset class is quite subjective, requiring precise distinctions where none exist. Returns and correlations are difficult to forecast. Historical data provide a guide, but must be modified to recognize structural changes and compensate for anomalous periods. Quantitative measures have difficulty incorporating factors such as market liquidity or the influence of significant, low-probability events. In spite of the operational challenges, the rigor required in conducting mean-variance analysis brings an important perspective to the asset allocation process.

The combination of quantitative analysis and market judgment employed by Yale produces the following portfolio:

The Yale Endowment Portfolio:

Performance and Asset Allocation--Rebalancing

Endowment Highlights

RECESSION

	Fiscal Year				
	2012	2011	2010	2009	2008
Market Value (in millions)	$19,344.6	$19,374.4	$16,652.1	$16,326.6	$22,869.7
Return	4.7%	21.9%	8.9%	-24.6%	4.5%
Spending (in millions)	$ 994.2	$ 986.8	$ 1,108.4	$ 1,175.2	$ 849.9
Operating Budget Revenues (in millions)	$ 2,851.7	2,734.2	2,681.3	2,559.8	2,280.2
Endowment Percentage	34.9%	36.1%	41.3%	45.9%	37.3%
Asset Allocation (as of June 30)					
Absolute Return	14.5%	17.5%	21.0%	24.3%	25.1%
Domestic Equity	5.8	6.7	7.0	7.5	10.1
Fixed Income	3.9	3.9	4.0	4.0	4.0
Foreign Equity	7.8	9.0	9.9	9.8	15.2
Natural Resources	8.3	8.7	8.8	11.5	10.4
Private Equity	35.3	35.1	30.3	24.3	20.2
Real Estate	21.7	20.2	18.7	20.6	18.9
Cash	2.7	-1.1	0.4	-1.9	-3.9

Yale sold a little bit of their equity didn't rebalance before the crash; maybe they didn't know the crash was coming?

bonds went down

11 % increase in private equity post-recession

Yale Rebalances their Portfolio too!

Lessons from the Crisis

The financial crisis highlighted a number of important issues and lessons that investors would be wise to heed. The crisis made clear the importance of a long-term orientation and underscored the need to support a diversified, equity-oriented, active-management strategy with adequate organizational resources and capabilities.

Organizations, investment teams, and committees that lack commitment to a long time horizon make sub-optimal decisions during periods of tumult and uncertainty. During 2008 and 2009, for example, some institutions overreacted to short-term concerns surrounding portfolio performance and volatility, choosing to reduce equity exposure near the market's nadir. Yale instead sought to maintain equity exposure, aggressively managing liquidity and prudently employing debt. Similarly, after the October 1987 stock market crash, Yale made a rebalancing purchase of nearly \$100 million of equities (representing more than 5% of Endowment value) funded by a corresponding sale of nearly \$100 million of bonds. In the context of crisis-induced gloom, Yale's actions appeared rash, particularly as many institutions responded to market declines by further reducing their already diminished equity exposure. In both cases, however, as markets rebounded, Yale's equity positions produced outsized returns. Those that chose an untimely reversal of strategy missed the benefits of the recovery.

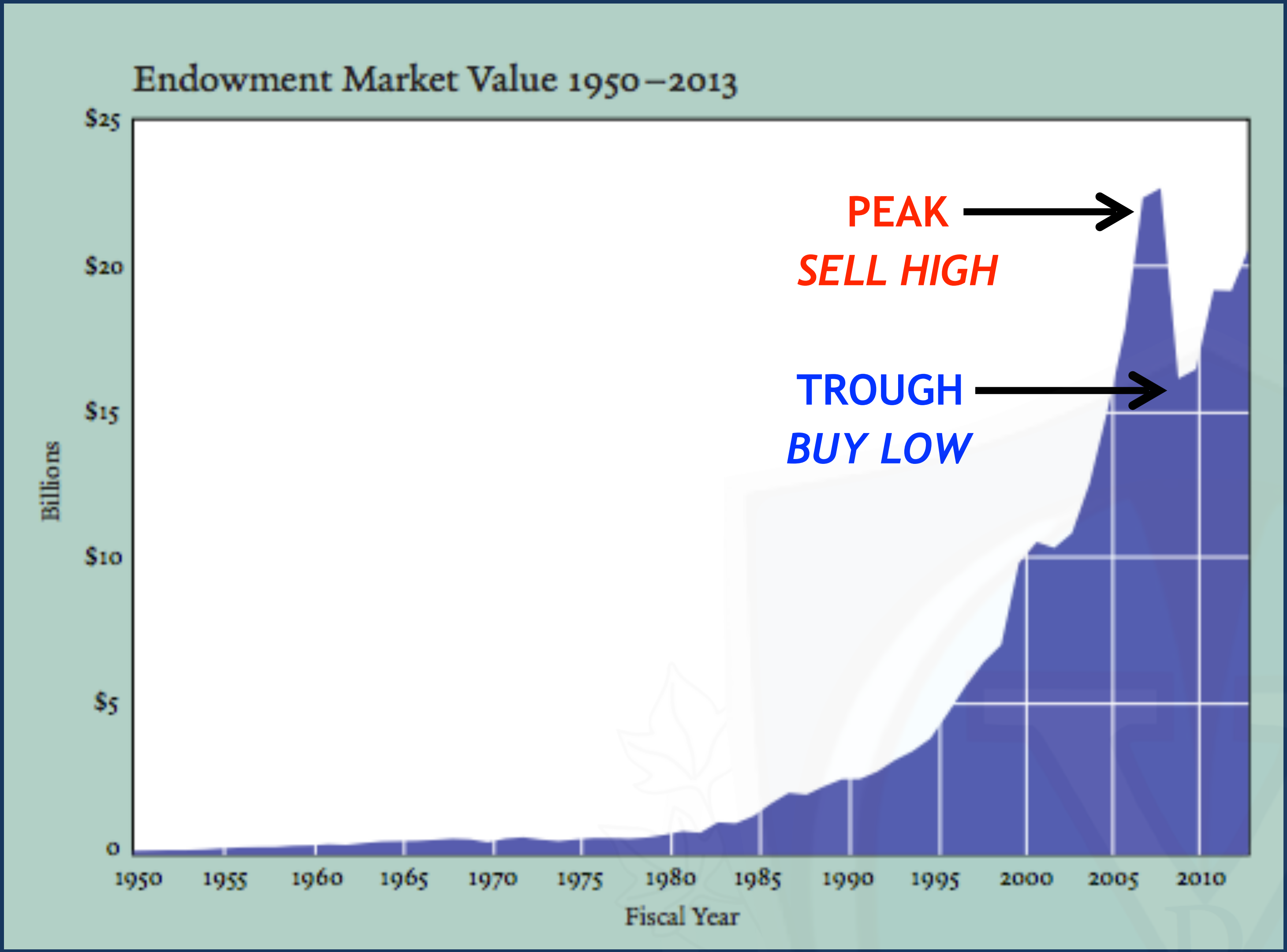
The crisis emphasized that the Yale model is only appropriate for organizations with a strong, dedicated, and skilled investment staff. Although the fundamental principles of the Yale model are straightforward, execution of an active management strategy demands a significant commitment of resources, particularly during chaotic and uncertain times. Identifying high-quality active managers with the ability to generate alpha consistently requires dedicated sourcing, researching, and monitoring of investment funds. Demands on management are amplified during market dislocations when sensibly reallocating funds between managers and making challenging rebalancing decisions depend upon the knowledge and input of experienced investment staff. Establishing and maintaining an unconventional investment profile require acceptance of uncomfortably idiosyncratic portfolios, which can, at times, appear imprudent. Unless institutions maintain contrarian positions through difficult times, the resulting damage of buying high and selling low imposes severe financial and reputational costs.

The financial crisis highlighted the importance of understanding, forecasting, and managing portfolio liquidity, which can change dramatically during periods of turmoil. Investors with large allocations to illiquid assets must possess a sophisticated understanding of the liquidity tools at their disposal and must dedicate sufficient organizational resources to modeling, tracking, and stress-testing portfolio liquidity.

The Yale model of endowment investing is not appropriate for everyone. Investors must address the particular investment policy needs of their institutions and take into consideration their resources and temperament. Only those organizations with a true long-term perspective and sufficient staff resources should pursue an active, equity-oriented, alternatives-focused investment strategy. The costly game of active management guarantees failure for the casual participant.

Yale Endowment:

Graphical Evidence of *Portfolio Rebalancing*



Ends Notes on Portfolio Management

- rebalancing is a good safety measure, but don't retain every asset in your portfolio forever

- don't get attached to your stocks, rely on your analysis
  - if future performance looks poor, get rid of the stock
  - past performance has no relevance

- **know when to hold 'em and when to fold 'em**

  - how do you make these decisions?

    * fundamental and technical analysis
    * other valuation strategies

RECAP

1. Allocate your assets according to your derived risk profile

2. Diversify within asset classes

3. Rebalance your portfolio
   - once a year OR…
   - if it goes beyond your arbitrarily decided threshold (usually ~10%)

4. Know when to hold ‘em and when to fold ‘em

Guest Speaker (next week!)

Nicholas Barberis

He is Faculty Advisor of YUDI and a professor at the School of Management; you should be there to listen and can introduce yourself afterwards!

When?

TUESDAY, NOVEMBER 18th
8.00 PM, LC 211