CalABLE BOARD

Investment Training

April 2018

PCA PENSION CONSULTING ALLIANCE

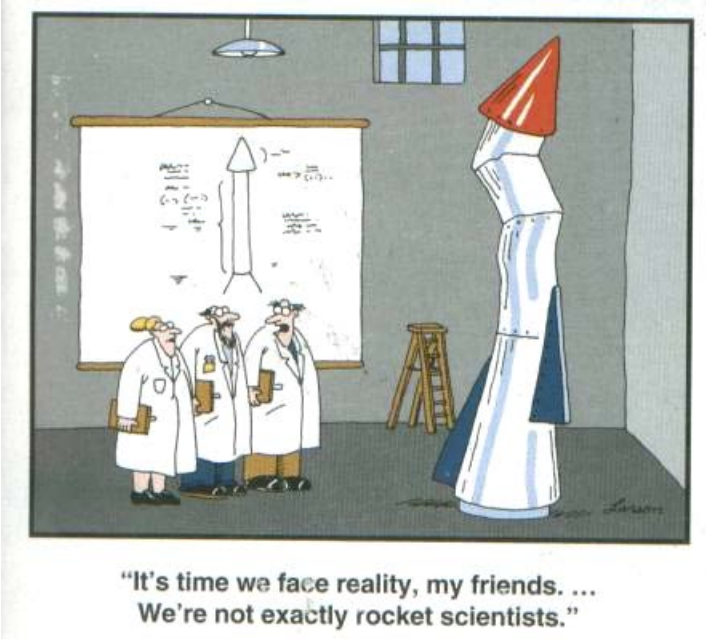
Agenda Items

Section	Tab
Overview of Asset Classes	1
Asset Allocation	2

Section 1: Overview of Asset Classes

Overview of Asset Classes

- Luckily, you don't need to be a rocket scientist to understand the basics of investing and the global capital markets
- Unfortunately, the investment world is filled with befuddling jargon designed to make the speaker appear intelligent and to sale products and advice
- Once you boil investments down to the basics, the investment landscape becomes much more accessible and useful to the average person



"It's time we face reality, my friends. ... We're not exactly rocket scientists."

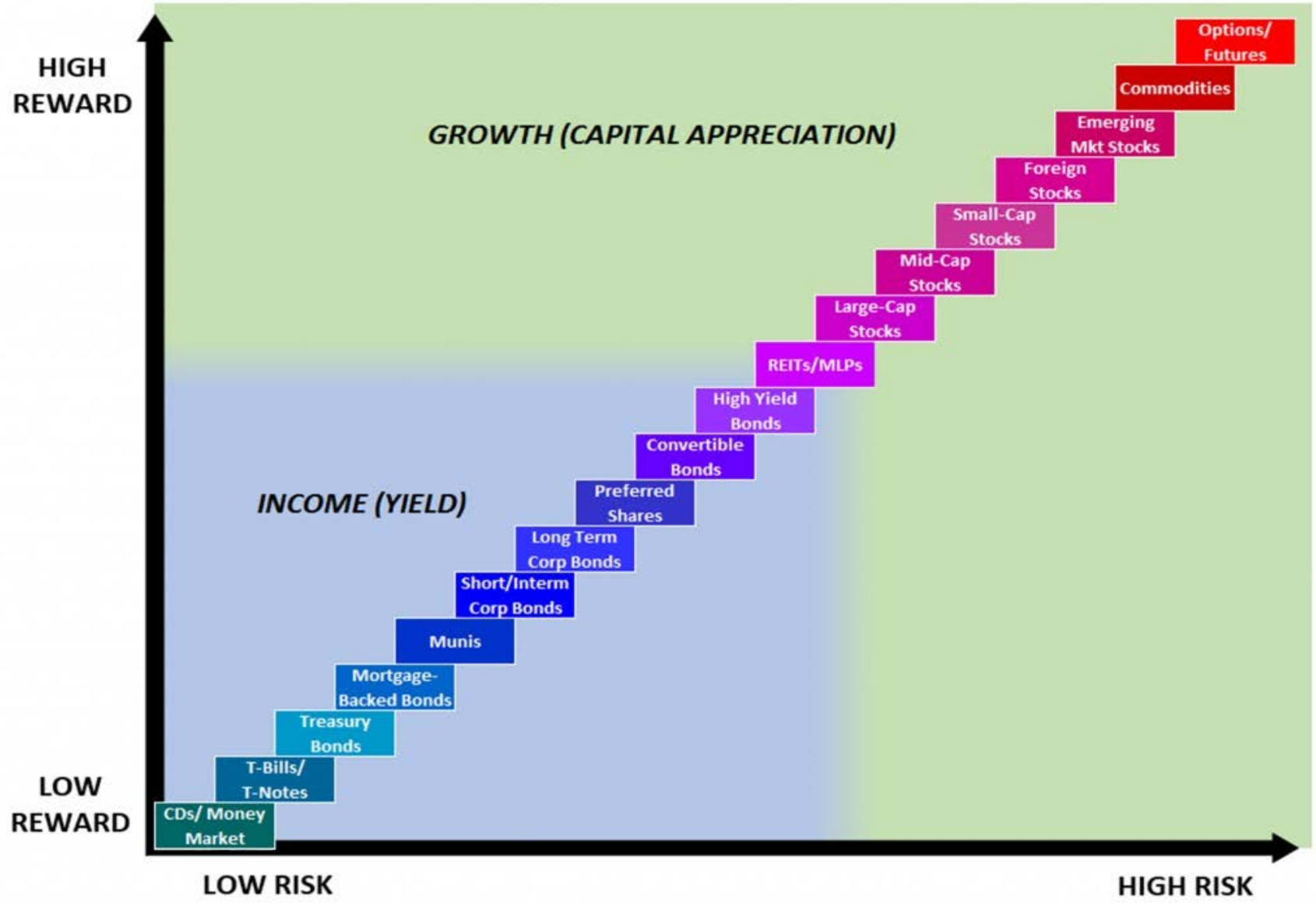
Overview of Asset Classes

- The CalABLE Program (as well as other ABLE programs) appear broadly diversified
  - Numerous underlying funds
  - Thousands of underlying securities

- In reality, CalABLE is only composed of two broad asset classes:
  - Global Equities – Stocks
  - Fixed Income – Bonds
  - The only exception is the FDIC-insured Bank Deposit option - which is a banking product, not a traditional investment security or asset class

- That said, those two broad asset classes can be broken into numerous sub-asset classes - each with its own inherent risk and return potential
  - The following page depicts a number of sub-asset classes on a linear spectrum from low risk to high risk

Overview of Asset Classes



Overview of Asset Classes: Fixed Income

Bond Investor

- Bonds are essentially loans that the investor (lender) makes to an entity (borrowers)

- Bonds are issued by a myriad of borrowers

  - **Treasuries** are loans made to the U.S. Government in the form of T-Bills, Notes, and Bonds
  - **Mortgage Backed Securities** (MBS) bonds are backed by pools of hundreds/thousands of home mortgages packaged together and sold to investors
  - **Corporate** bonds are loans made to corporations
  - **Asset Backed Securities** (ABS) bonds are backed by pools of hundreds/thousands of car loans, credit card loans, etc.
  - **Sovereign** bonds are loans made to foreign governments
  - **Municipal** bonds are loans made to municipalities and states

- While these are the largest bond market segments, numerous others exist

Overview of Asset Classes: Fixed Income

Bond Investor

- As the investor you are agreeing to loan the borrower money at a certain interest rate (yield) for a certain amount of time (maturity)
  - It's the same relationship you have with your bank with regards to your mortgage and credit cards… The only difference is the roles are reversed and you are the one making the loan

- You will often hear the terms bonds and Fixed Income used interchangeably
  - Technically, Fixed Income is the name of the Asset Class, whereas bonds are the underlying assets
  - i.e. your Fixed Income allocation is comprised of investments in bonds

Overview of Asset Classes: Fixed Income

Bond Investor

- The most important objective for a bond investor is to get their money back when the bond matures… the second most important thing is to earn a return on the loan through the interest payments

- The ability to get your money back on a bond is determined by two factors: 1.) the credit worthiness of the borrower and 2.) the assets (if any) pledged as collateral for the loan

1. The credit worthiness of a bond is determined by the ability and willingness of the borrower to pay
   - Credit worthiness is estimated by the major credit rating agencies (S&P, Fitch, Moody's) who assign alphabetical ratings
   - AAA is the highest rated bond, followed by AA rated and so on
   - Bonds rated below BBB are considered High Yield bonds or Junk bonds
   - The lower the rating the higher probability the borrower will be unable to make its payments and default on the bonds

Overview of Asset Classes: Fixed Income

Bond Investor

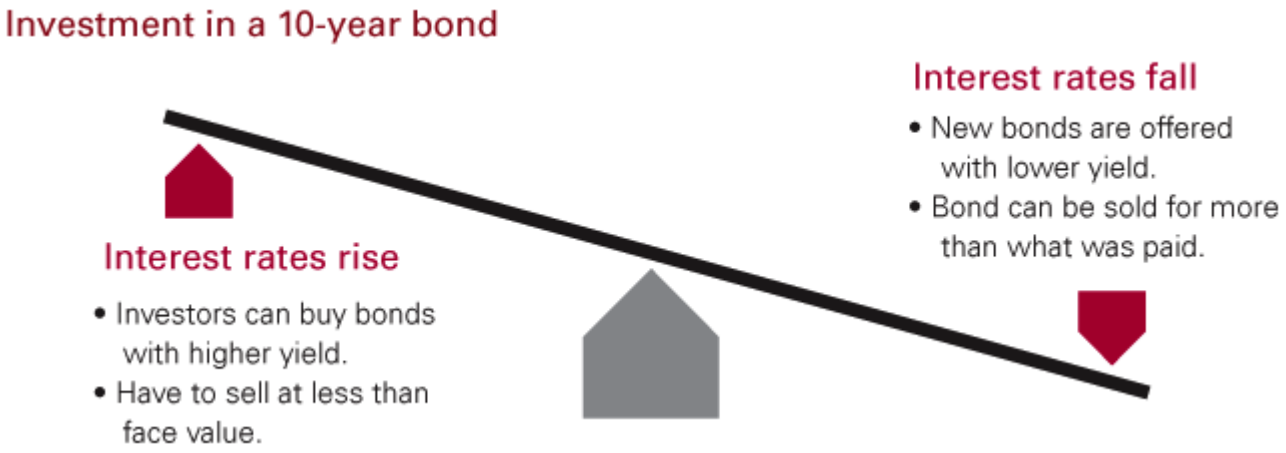
- The ability to get your money back on the bond is determined by two factors: 1.) the credit worthiness of the borrower and 2.) what assets (if any) are pledged as collateral for the loan

2. The collateral for a loan varies by the borrower
    - Corporate bonds – Backed by the assets of the firm
    - Mortgages (MBS) – Backed by the value of the home
    - Treasuries – Nothing (faith?)

Overview of Asset Classes: Fixed Income

Bond Investor

- Unfortunately, credit risk is not the only risk involved in investing in bonds
- Investors also face interest rate risk
  - There is an inverse relationship between bond prices and interest rates



Overview of Asset Classes: Fixed Income

Bond Investor

- Investors face the possibility of capital loss if interest rates rise
- Lets look at an example:
  - You buy a bond with 11 years to maturity that yields 2% trading at par ($100)
  - After a year passes interest rates have gone up to 5% and you want to sell your bond
  - Will you get $100 when you go to sell the bond? => No
  - Why not? The buyer could just as easily buy a new identical 10 year bond yielding 5% and make more money over the life of the investment
  - So for the buyer to be willing to buy your bond, your bond must allow him to make an equivalent amount of money as the identical 5% bond
  - How does this happen? => The price of your bond must go down
  - In order for the two bonds to have identical returns over the next 10 years your bond must be sold at => $76.83!
  - You have a capital loss of 23% because of the increase in interest rates

Overview of Asset Classes: Fixed Income

DEFINITION

- Loans in U.S. dollars of companies, governmental entities or agencies, banks, and insurance companies with finite lives domiciled in the U.S. or issued in the U.S.

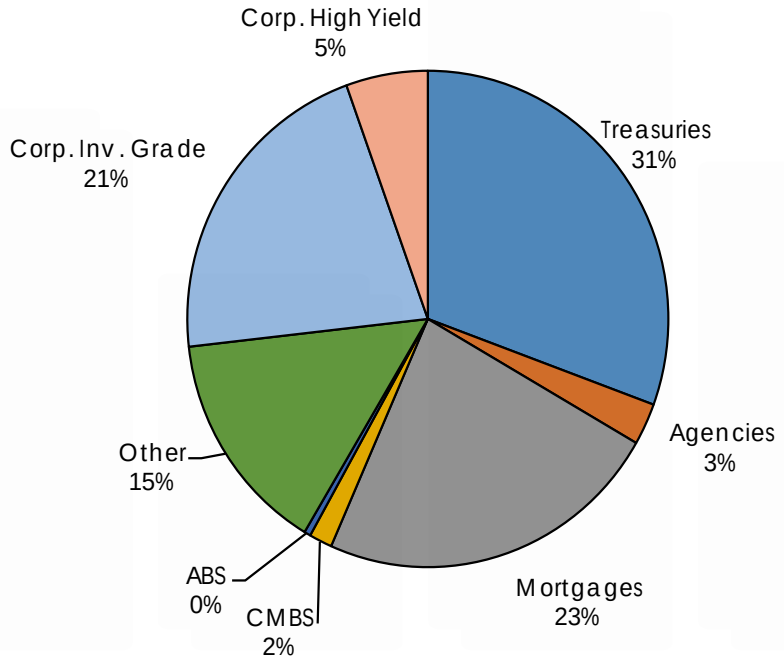
SIZE OF MARKET

- $24.4 trillion total market capitalization as of 12/31/2017– Bloomberg Barclays Capital Universal

STRATEGIC ROLE

- Diversification within a multi-asset class, total return portfolio
- Hedge against a long duration accrued liability
- Current income

SECTOR BREAKDOWN OF Blmbg BC UNIVERSAL
(percentage of market cap as of 12/31/2017)



Source: Bloomberg Barclays Live

Overview of Asset Classes: Global Equities

Stock Investor

- Stocks represent the bottom layer in a company's capital structure
  - Also known as: Common Stocks, Common Equity, Equities
    - i.e. the equity market is the same thing as the stock market

- Whereas bonds represent loans to a company, stocks represent ownership in the company
  - As an owner in the company the results of your investment are directly linked to how well the business is doing
    - Unlike bond investors who only care if the company generates sufficient cash to pay interest on the bonds
  - If the company performs well, as a stockholder, you would expect your stock to appreciate in value
  - Stock investors are rewarded in two ways
    - Dividends: Cash paid to investors out of a portion of the company's earnings
    - Appreciation: Increase in the stock's price due to the company's prospects improving
      - Expectations of higher earnings in the future
      - Higher future earnings allow the company to pay a larger dividend in the future

Overview of Asset Classes: Global Equities

Stock Investor

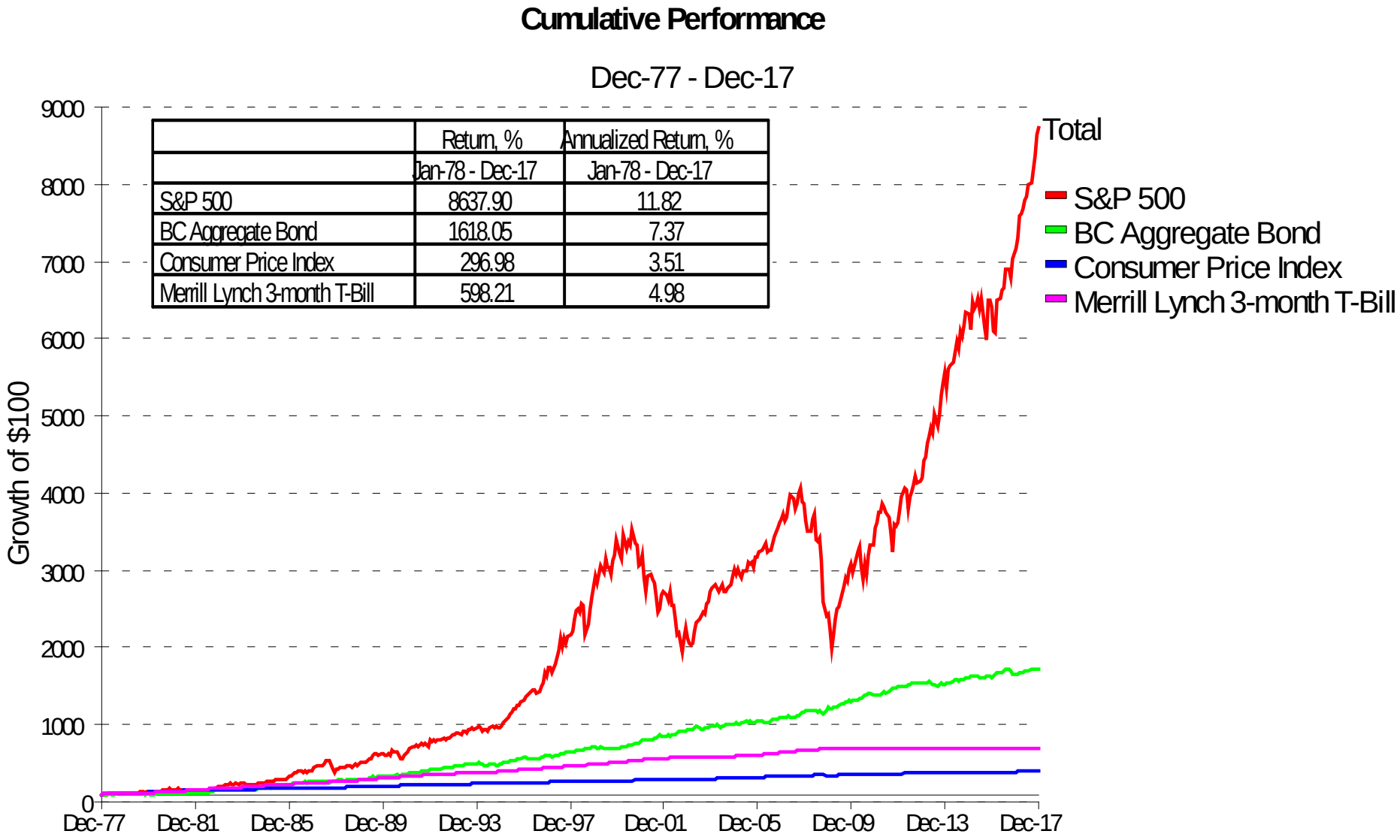
- Being the owner of the company, a stock investor's returns are inexorably linked to the performance of the underlying business
  - If the company does well the investor will benefit over time
  - If the company does poorly the investor stands to lose their entire investment

- A reasonable person may wonder why anyone would take the risk of owning stocks if they could own bonds instead and have their profit guaranteed as long as the borrower doesn't go bankrupt (and even if it does… likely still get some money back)

- The answer is, the bond investor has a set profit on the investment whereas the stock investor has unlimited profit potential

- Over the long-term the performance of a stock closely matches that of the underlying business
  - Overall stock market selloffs and periods of over-exuberance can lead to the stock's performance deviating from that of the underlying company
    - These deviations are, however, corrected with time

Overview of Asset Classes: Global Equities



Overview of Asset Classes: Global Equity

DEFINITION

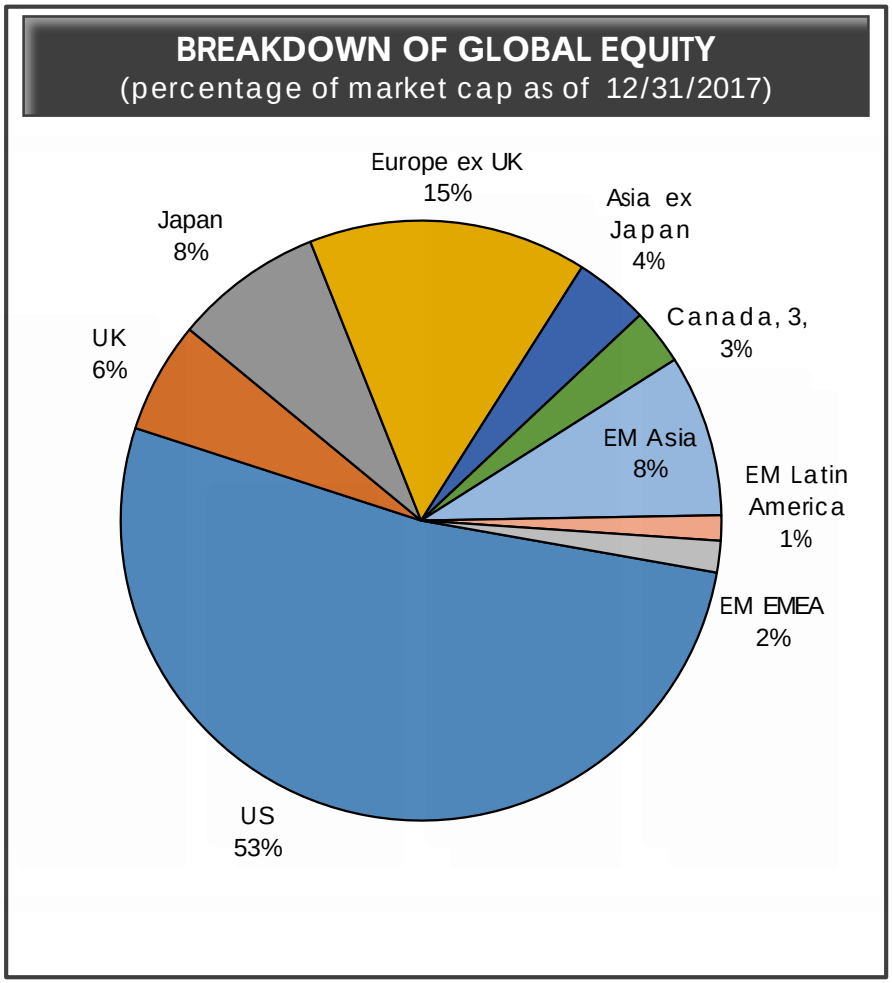
- Ownership interest in publicly traded companies
- Shares are registered across a variety of different regulatory bodies
- A market-weighted combination of U.S. and Non-U.S. markets

SIZE OF MARKET

- $46.8 trillion total market capitalization as of 12/31/2017 – MSCI ACWI IMI Index

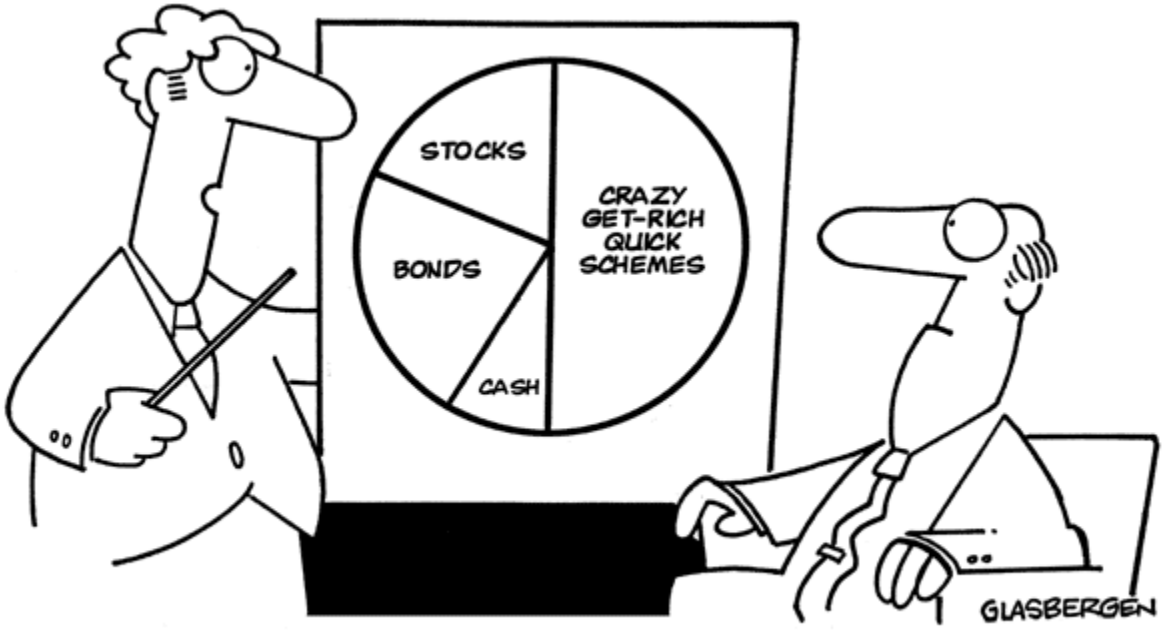
STRATEGIC ROLE

- Key rationale to adopting global equity framework is declining dominance of U.S. equity market over the next several decades
- Global equity market correlations have increased, rendering regional decision less important
- Global equity is (i) a recognition of stronger long-term economic growth outside of the U.S. and (ii) a broadening of the opportunity set for asset managers



Source: MSCI ACWI World

Section 2: Asset Allocation



"I'd like you to consider a bold new strategy..."

Asset Allocation

- Asset allocation is the determination of how an investor's portfolio is allocated across different asset classes
- Asset allocation attempts to balance risk versus reward by adjusting the percentage of each asset in an investment portfolio according to the investor's risk tolerance, goals, and investment time frame
- Asset allocation is the most important decision an investor makes
- While often overshadowed by manager/security selection, asset allocation decisions have a much larger impact on an investor's risk and return (80/20 dilemma)
- A properly developed asset allocation is one that combines risky assets (stocks) with less risky assets (bonds & cash) in a way that an investor can meet their return target while minimizing their risk

Asset Allocation

- The obvious question arises, why not just invest in the asset classes which have the highest expected long-term returns?

- The problem with such an approach is the volatility exhibited by high expected return asset classes

- There exists a tradeoff between volatility and return
  - Historically, stocks have significantly outperformed other asset classes
  - But with significantly greater volatility

- By combining a risky asset like stocks with a relatively safe asset like bonds the investor achieves diversification
  - Diversification happens when assets don't move directly together

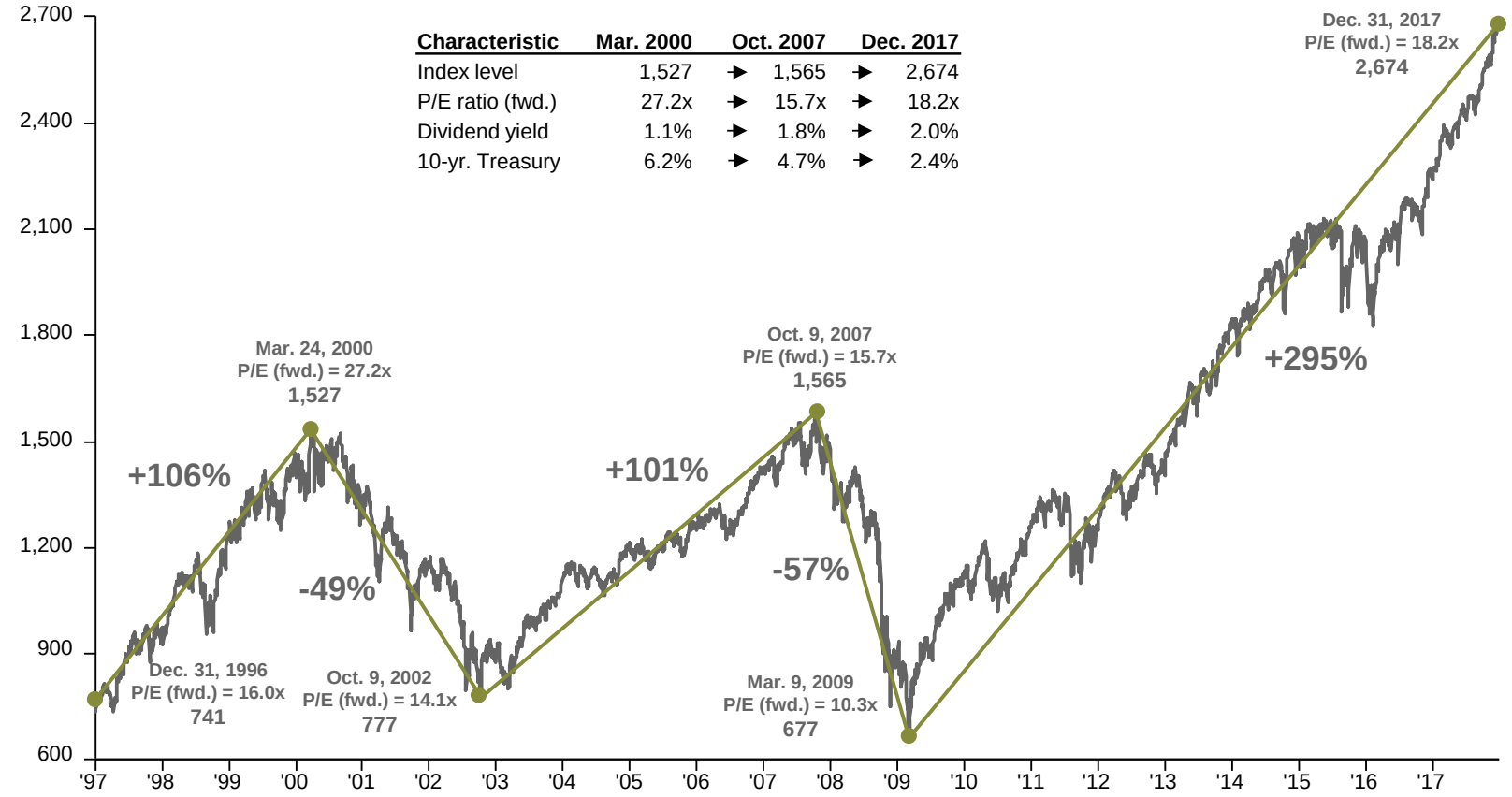
- By holding assets that are not highly correlated (asset values do not move up and down in perfect tandem) the overall portfolio exhibits less risk (volatility) than the individual risky assets

- Since diversification can reduce risk while not reducing expected return, diversification is often said to be the "only free lunch" in investing

Asset Allocation

- US equities have demonstrated the potential volatility of risky assets during the past 20 years with two 50% market declines

S&P 500 Price Index



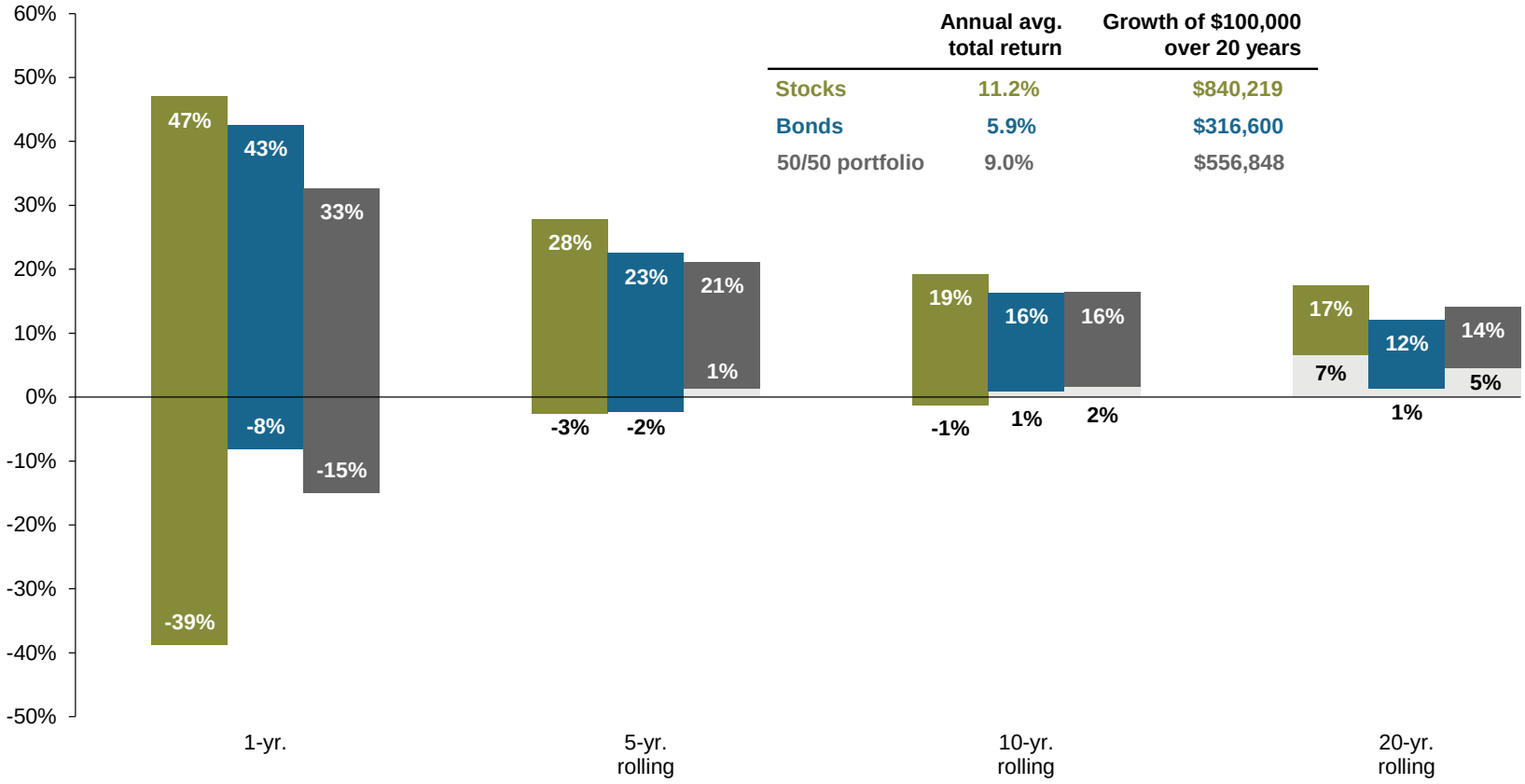
Source: Compustat, FactSet, Thomson Reuters, Federal Reserve, Standard & Poor's, J.P. Morgan Asset Management.
Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price to earnings ratio is a bottom-up calculation based on the most recent S&P 500 Index price, divided by consensus estimates for earnings in the next 12 months (NTM), and is provided by FactSet Market Aggregates. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns.
Guide to the Markets – U.S. Data are as of December 31, 2017.

Asset Allocation

- Over time, risky assets generate much higher returns than safe assets but exhibit significantly high volatility year-to-year

Range of stock, bond and blended total returns

Annual total returns, 1950-2017

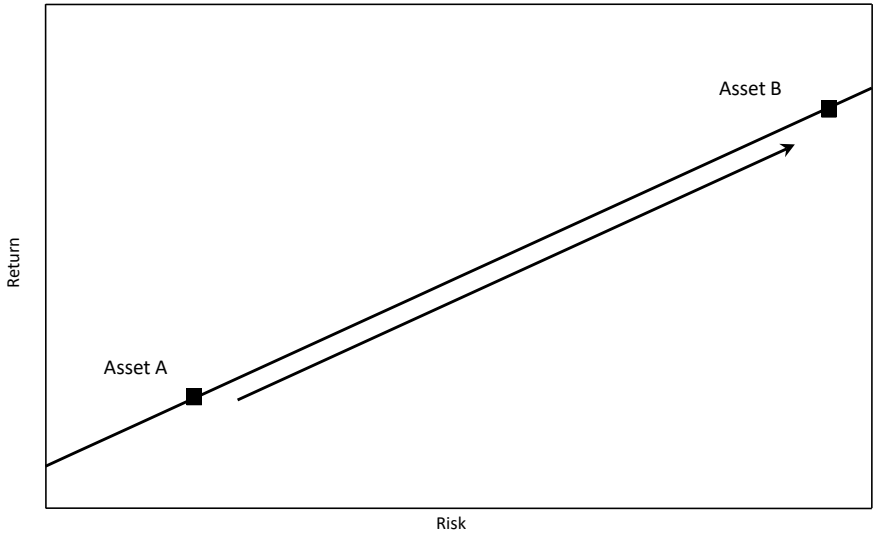


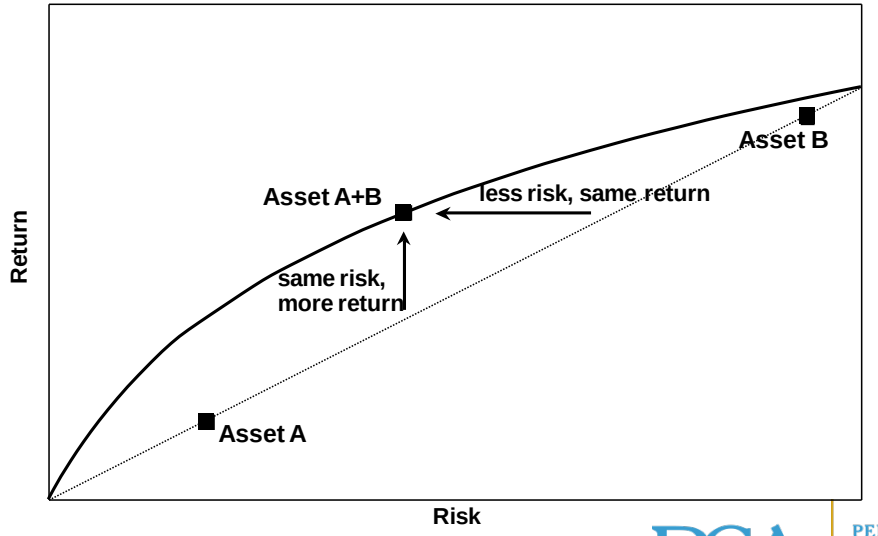
	Annual avg. total return	Growth of $100,000 over 20 years
Stocks	11.2%	$840,219
Bonds	5.9%	$316,600
50/50 portfolio	9.0%	$556,848

Source: Barclays, FactSet, Federal Reserve, Robert Shiller, Strategas/Ibbotson, J.P. Morgan Asset Management.
Returns shown are based on calendar year returns from 1950 to 2017. Stocks represent the S&P 500 Shiller Composite and Bonds represent Strategas/Ibbotson for periods from 1950 to 2010 and Barclays Aggregate thereafter. Growth of $100,000 is based on annual average total returns from 1950 to 2017.
Guide to the Markets – U.S. Data are as of December 31, 2017.

Asset Allocation

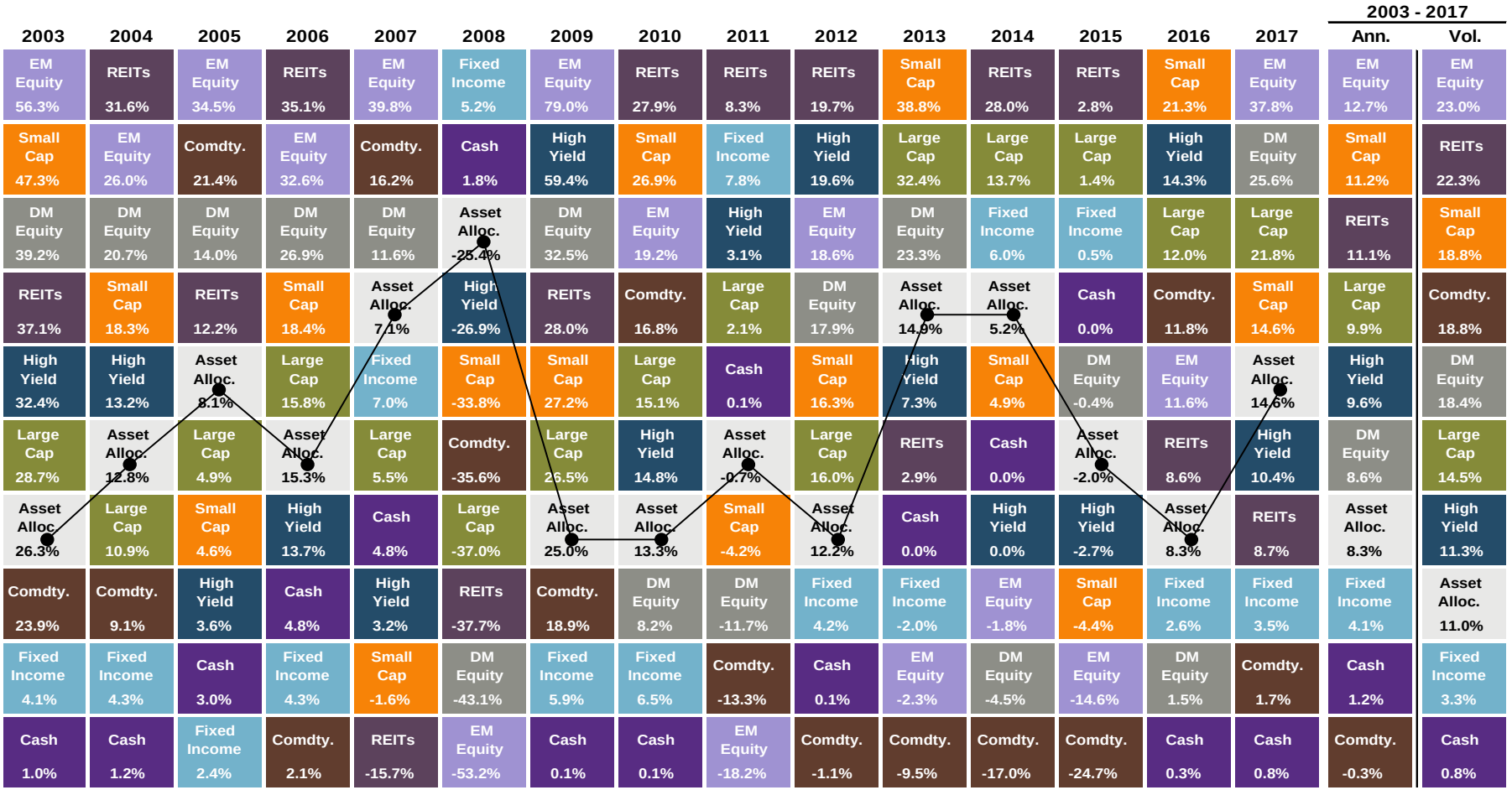
- A keystone to modern portfolio management is the idea of the "Efficient Frontier"
- The efficient frontier is based on the idea that there is a tradeoff between risk and return
  - To increase the expected return of a portfolio an investor needed to increase the risks that they take
- Diversification has a profound effect on the efficient frontier as the frontier shifts from a straight linear line to a curved line
  - Diversification allows for a more efficient portfolio (same risk more return)





Asset Allocation

Returns for Different Asset Classes



2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2003 - 2017 Ann.	2003 - 2017 Vol.
EM Equity 56.3%	REITs 31.6%	EM Equity 34.5%	REITs 35.1%	EM Equity 39.8%	Fixed Income 5.2%	EM Equity 79.0%	REITs 27.9%	REITs 8.3%	REITs 19.7%	Small Cap 38.8%	REITs 28.0%	REITs 2.8%	Small Cap 21.3%	EM Equity 37.8%	EM Equity 12.7%	EM Equity 23.0%
Small Cap 47.3%	EM Equity 26.0%	Comdty. 21.4%	EM Equity 32.6%	Comdty. 16.2%	Cash 1.8%	High Yield 59.4%	Small Cap 26.9%	Fixed Income 7.8%	High Yield 19.6%	Large Cap 32.4%	Large Cap 13.7%	Large Cap 1.4%	High Yield 14.3%	DM Equity 25.6%	Small Cap 11.2%	REITs 22.3%
DM Equity 39.2%	DM Equity 20.7%	DM Equity 14.0%	DM Equity 26.9%	DM Equity 11.6%	Asset Alloc. -25.4%	DM Equity 32.5%	EM Equity 19.2%	High Yield 3.1%	EM Equity 18.6%	DM Equity 23.3%	Fixed Income 6.0%	Fixed Income 0.5%	Large Cap 12.0%	Large Cap 21.8%	REITs 11.1%	Small Cap 18.8%
REITs 37.1%	Small Cap 18.3%	REITs 12.2%	Small Cap 18.4%	Asset Alloc. 7.1%	High Yield -26.9%	REITs 28.0%	Comdty. 16.8%	Large Cap 2.1%	DM Equity 17.9%	Asset Alloc. 14.9%	Asset Alloc. 5.2%	Cash 0.0%	Comdty. 11.8%	Small Cap 14.6%	Large Cap 9.9%	Comdty. 18.8%
High Yield 32.4%	High Yield 13.2%	Asset Alloc. 8.1%	Large Cap 15.8%	Fixed Income 7.0%	Small Cap -33.8%	Small Cap 27.2%	Large Cap 15.1%	Cash 0.1%	Small Cap 16.3%	High Yield 7.3%	Small Cap 4.9%	DM Equity -0.4%	EM Equity 11.6%	Asset Alloc. 14.6%	High Yield 9.6%	DM Equity 18.4%
Large Cap 28.7%	Asset Alloc. 12.8%	Large Cap 4.9%	Asset Alloc. 15.3%	Large Cap 5.5%	Comdty. -35.6%	Large Cap 26.5%	High Yield 14.8%	Asset Alloc. -0.7%	Large Cap 16.0%	REITs 2.9%	Cash 0.0%	Asset Alloc. -2.0%	REITs 8.6%	High Yield 10.4%	DM Equity 8.6%	Large Cap 14.5%
Asset Alloc 26.3%	Large Cap 10.9%	Small Cap 4.6%	High Yield 13.7%	Cash 4.8%	Large Cap -37.0%	Asset Alloc. 25.0%	Asset Alloc. 13.3%	Small Cap -4.2%	Asset Alloc. 12.2%	Cash 0.0%	High Yield 0.0%	High Yield -2.7%	Asset Alloc. 8.3%	REITs 8.7%	Asset Alloc. 8.3%	High Yield 11.3%
Comdty. 23.9%	Comdty. 9.1%	High Yield 3.6%	Cash 4.8%	High Yield 3.2%	REITs -37.7%	Comdty. 18.9%	DM Equity 8.2%	DM Equity -11.7%	Fixed Income 4.2%	Fixed Income -2.0%	EM Equity -1.8%	Small Cap -4.4%	Fixed Income 2.6%	Fixed Income 3.5%	Fixed Income 4.1%	Asset Alloc. 11.0%
Fixed Income 4.1%	Fixed Income 4.3%	Cash 3.0%	Fixed Income 4.3%	Small Cap -1.6%	DM Equity -43.1%	Fixed Income 5.9%	Fixed Income 6.5%	Comdty. -13.3%	Cash 0.1%	EM Equity -2.3%	DM Equity -4.5%	EM Equity -14.6%	DM Equity 1.5%	Comdty. 1.7%	Cash 1.2%	Fixed Income 3.3%
Cash 1.0%	Cash 1.2%	Fixed Income 2.4%	Comdty. 2.1%	REITs -15.7%	EM Equity -53.2%	Cash 0.1%	Cash 0.1%	EM Equity -18.2%	Comdty. -1.1%	Comdty. -9.5%	Comdty. -17.0%	Comdty. -24.7%	Cash 0.3%	Cash 0.8%	Comdty. -0.3%	Cash 0.8%

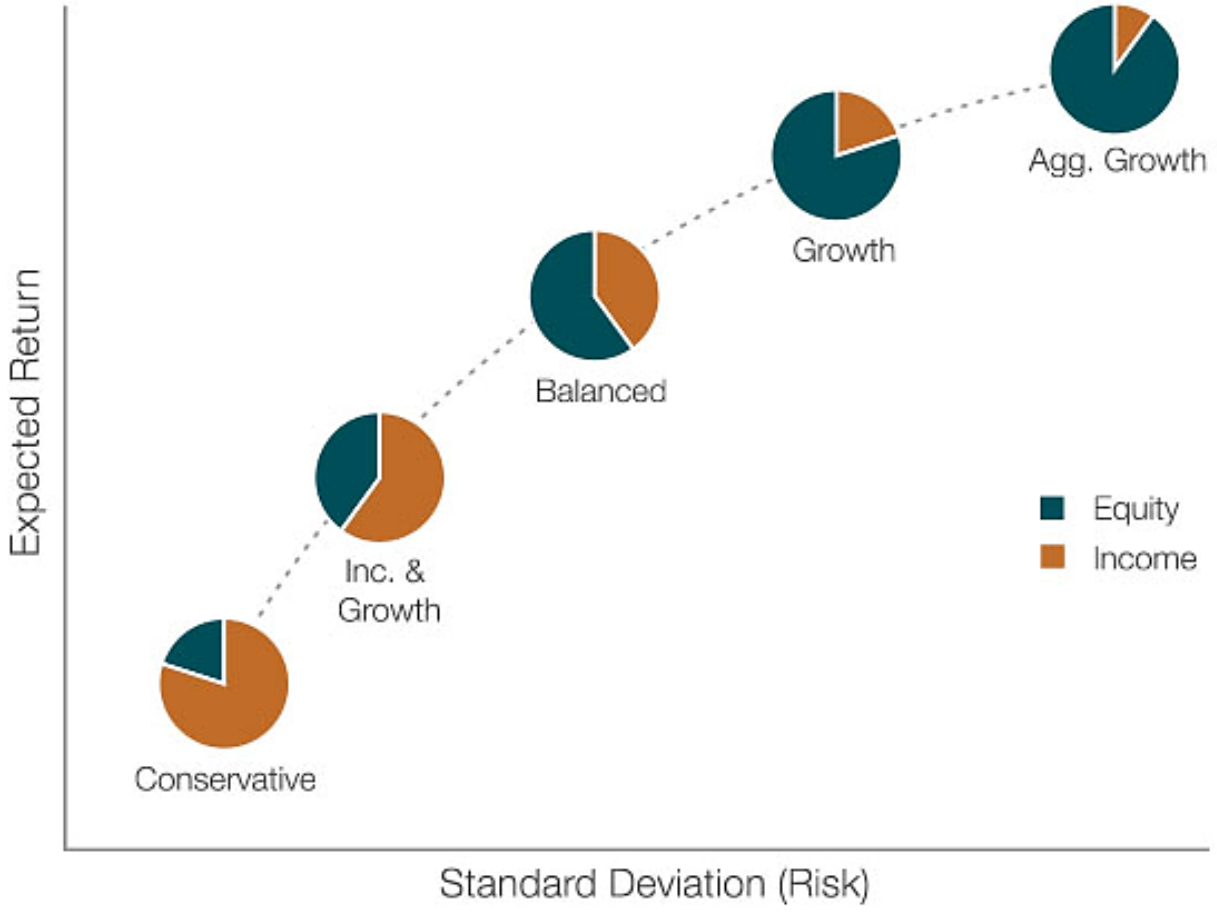
Source: Barclays, Bloomberg, FactSet, MSCI, NAREIT, Russell, Standard & Poor's, J.P. Morgan Asset Management.
Large cap: S&P 500, Small cap: Russell 2000, EM Equity: MSCI EME, DM Equity: MSCI EAFE, Comdty: Bloomberg Commodity Index, High Yield: Barclays Global HY Index, Fixed Income: Barclays US Aggregate, REITs: NAREIT Equity REIT Index. The "Asset Allocation" portfolio assumes the following weights: 25% in the S&P 500, 10% in the Russell 2000, 15% in the MSCI EAFE, 5% in the MSCI EME, 25% in the Barclays US Aggregate, 5% in the Barclays 1-3m Treasury, 5% in the Barclays Global High Yield Index, 5% in the Bloomberg Commodity Index and 5% in the NAREIT Equity REIT Index. Balanced portfolio assumes annual rebalancing. Annualized (Ann.) return and volatility (Vol.) represents period of 12/31/02 – 12/31/17. Please see disclosure page at end for index definitions. All data represents total return for stated period. Past performance is not indicative of future returns.
Guide to the Markets – U.S. Data are as of December 31, 2017.

Asset Allocation

- The big takeaway from the concept of the efficient frontier is the idea that there exists an optimal portfolio for each investor
  - A portfolio that maximizes return given their risk tolerance
- In other words, an investor can "target" a certain risk level along the efficient frontier that aligns with their personal risk tolerance
  - Risk tolerance – an investors ability and willingness to take risk
- This concept of targeting a particular level of risk naturally led to the creation of "target risk" funds
- Target risk funds are designed to provide static exposure to a mix of investment assets that correspond to a particular risk level (point on the efficient frontier)

Asset Allocation

- Using one or multiple target risk portfolios allows an investor to target any point along the efficient frontier that aligns with their risk tolerance



Asset Allocation

- Investors used the concept of target risk portfolios and the efficient frontier to create what is known as a Glide Path
  - The major insight needed to get from target risk portfolios to a glide path was the realization that investors' risk tolerance (ability/willingness to bear volatility to achieve a certain rate of return) is not stable over time
  - Particularly, investors' risk tolerance decreases over time as they near the time when they will need to start taking distributions from their investments
    - Logically this make sense, if you do not need the money for a long time (20+ years) then volatility is less impactful as you have plenty of time to make up for any losses
      - As such, for investors with long time horizons it makes sense to be invested in the assets with the highest expected return and weather the associated volatility
    - On the other hand, if you have a short time horizon (<5 years) then volatility can greatly impact your portfolio
      - If you suffer a large loss just prior to the time you take a distribution you will essentially be locking in the loss because you will not have sufficient time to recoup the loss
      - As such, investors with short time horizons need to focus more on capital preservation (maintaining what you already have) rather than trying to earn a high return on their money
- A glide path creates an asset allocation that becomes more conservative as the investor nears the time when they need the money by moving from more aggressive target risk portfolios to less aggressive target risk portfolios

Asset Allocation

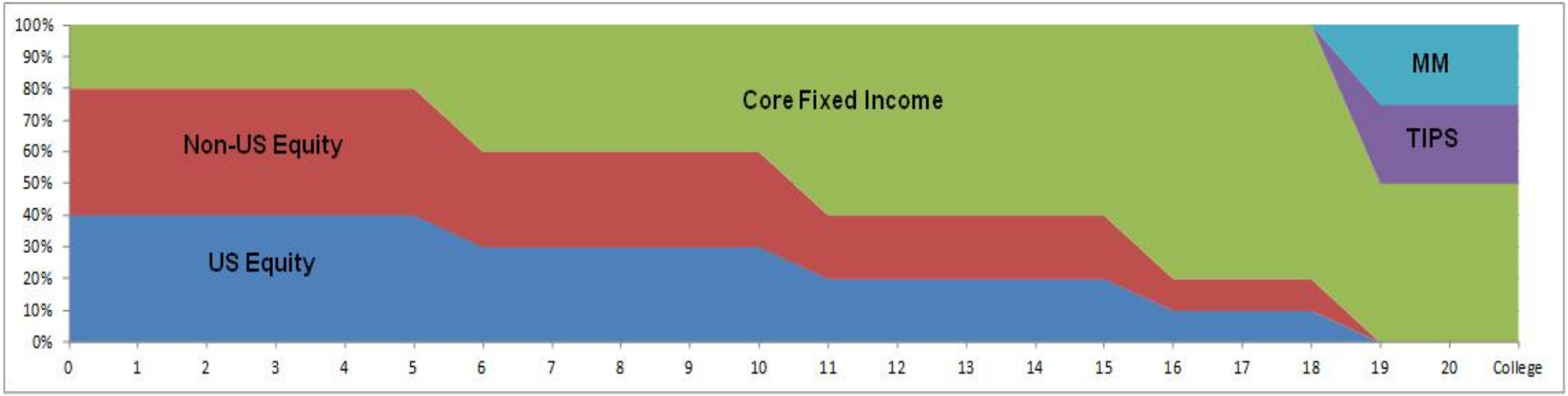
- Investment managers have used the concept of a glide path to create what are termed “Target Date Funds” or “Age Based Funds”
  - Despite the name differences they are essentially the same thing
    - Target date funds have a specific date assigned which coincides with when the investor needs the money
      - A retirement target date fund targets the year you plan to retire, while a college savings plan targets the date you plan to use the money for higher education
    - Age based funds instead coincide with the investor’s (beneficiary’s) current age and then uses commonly agreed upon dates for when the investor needs the money
      - For example, if you are saving for your 5 year old child’s education, you would select the fund associated with your kid’s age (i.e. the Age 5-7 fund)

- All glide path funds have one thing in common in that they progressively get more conservative over time
  - When the investor has a relatively long time horizon the fund will be invested in higher return higher risk assets such as stocks, real estate, and high yield bonds
  - As the investor ages the glide path will shift to a more balanced portfolio combining both risky assets and safe assets such as a mix of stocks and bonds
  - As the investor nears their target date the asset allocation shifts to a conservative allocation dominated by safe assets such as cash and bonds

Asset Allocation

- A target date fund is essentially a "one stop shop" for investors because it automatically readjusts the asset allocation over time so the investor does not have to worry if they are optimally invested at any point in time
  - As such, target date funds have become quite popular with investors given target date fund's "set it and forget in" nature

- However, there is no set standard on what constitutes a "typical" investor's risk tolerance
  - As such, target date funds offered from different investment managers can vary greatly and have materially different risk-return profiles



Questions?


"I don't know what's worse...you, Jenkins, snoring through my presentation, or you, Fredericks, complaining that it was keeping you awake!"

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