

# Using Index Funds and ETFs to Build a Core Portfolio

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# Key Points

- Being “average” is good
  - Consistently matching return of benchmark indices is high performance
- Asset allocation increases return
- Asset allocation reduces risk
- By lowering investors costs, index funds and index-based ETFs increase long term return

# Index Funds

- A mutual fund that
  - aims to replicate the movements of an index of a specific financial market, or
  - uses a set of rules of ownership that are held constant, regardless of market conditions
- Advantages: low cost, simplicity, lower turnovers, and no style drift
- Only a small number of ETFs are index funds

# Exchange Traded Funds

- Most ETFs are not index funds
- Look for passively managed ETFs
  - Holdings based upon a well known market indices
  - Avoid ETFs that try to time their investments
- Enhanced or fundamentally weighted ETFs
  - The jury is still out (actual return vs. back testing)
  - These ETFs have higher expense ratios
  - Can they out perform actively managed funds?
- Focus on index-based ETFs only
- Expense ratios matter!

# Some Attributes of ETFs

- Generally more tax efficient than mutual funds especially index-based ETFs (See Morningstar)
- Lower portfolio turnover, more tax efficient
- No cash drag
- Fees generally much lower than mutual funds
  - More transparent; no deferred sales charges or other kickbacks to the dealer
  - But need to consider broker commissions and spread (difference between buy and sell price)
- Can trade whenever market is open

# ETFs and Index Funds

- Avoid any index fund or ETF
  - Not based on a widely recognized index
  - Expense ratio greater than 30 basis points (0.3%)
  - That uses a methodology other than capitalization weighting to determine holdings
  - That does not closely correlate with the index it is intended to follow
  - That charges a load or 12B1 fees

# Actively Managed Funds Underperform their Indices

- Most investment managers for mutual funds under perform the corresponding index for their fund
- All Large Cap Funds
  - Over 1 year, 75.4%
  - Over 3 years, 52.1% *under perform* their index
  - Over 5 years, 63.8%
- All Small Cap Funds
  - Over 1 year, 71.8%
  - Over 3 years, 68.1% *under perform* their index
  - Over 5 years, 65.2%
- Being “average” places you in the top third!
- Source: S&P’s Indices Versus Active Funds Scorecard for mid-year 2010

# Some Things to Consider

- Fund expenses and fees
- How are index fund holdings determined
  - market capitalization vs. fundamental weighting or equal weighting
- Tax efficiency
  - Turnover ratio
- Transaction costs
  - Buying and selling
  - Penalties for early sale



# ETFs vs. Index Funds

- Index funds
  - Traded at the end of the business day
  - Usually have minimum purchase requirements (initial and subsequent)
  - Slightly higher expenses (a few basis points)
- Exchange traded funds
  - Can be traded anytime during the day
  - NAV and market price can vary
- Caution: most ETFs are not index funds

# Asset Allocation

- Diversifying a portfolio by holding investments in several investment categories to reduce risk
- The best-performing asset varies from year to year and is not easily predictable
- Different asset classes offer non-correlated returns
  - Diversification reduces the overall risk in terms of the variability of return for a given level of expected return.
- ETFs are “the only free lunch you will find in the investment game”
- Academic research has painstakingly explained the importance of asset allocation, and the problems of active management

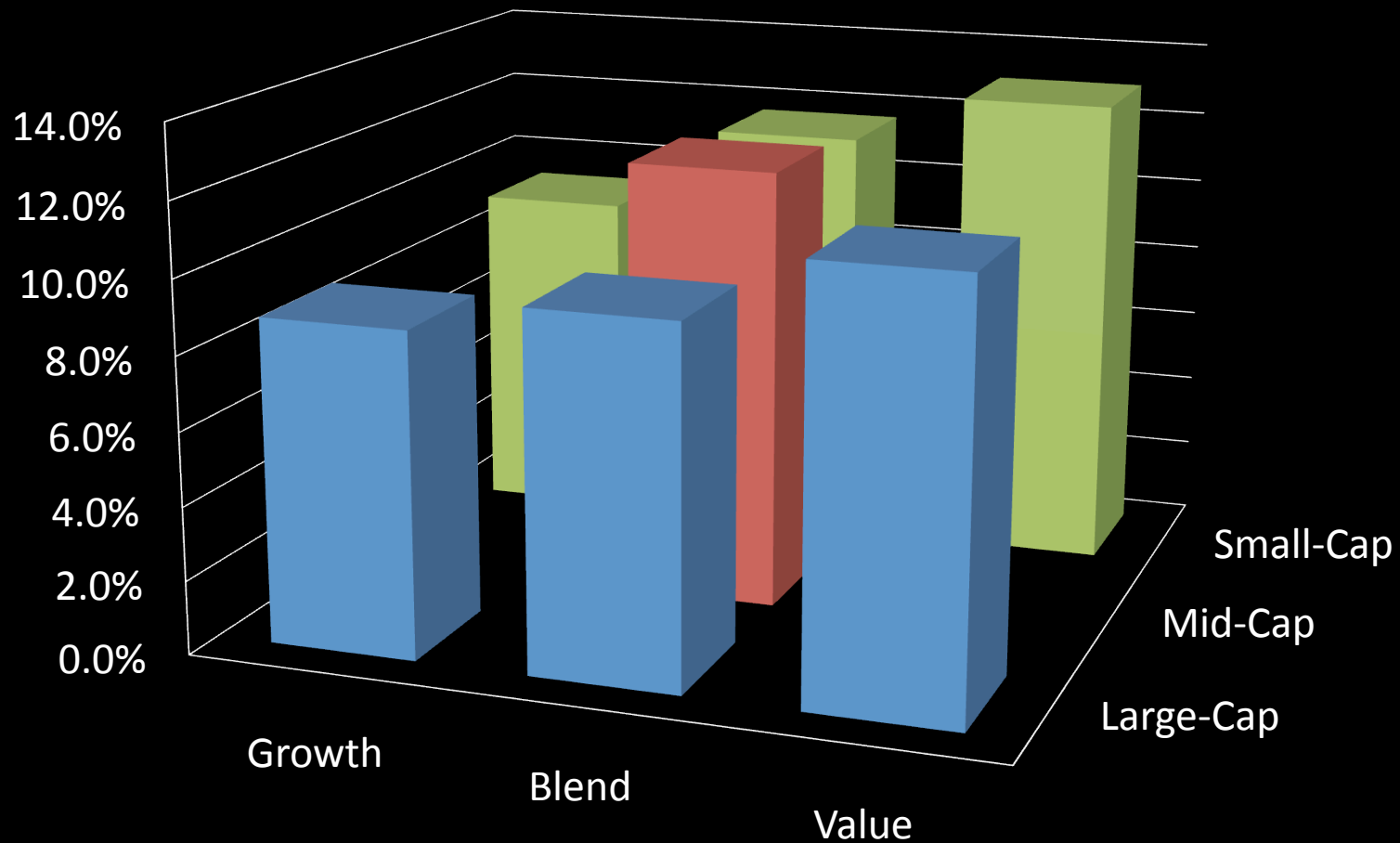
# Examples of Asset Classes

- Stocks: value, growth or blend; large-cap, mid-cap or small-cap; domestic, foreign, emerging markets
- Real estate: domestic and international
- Natural resources
- Precious metals
- Cash (*i.e.*, money market accounts)
- Bonds: investment grade or junk (high yield); government or corporate; short-term, intermediate, long-term; domestic, foreign, emerging markets

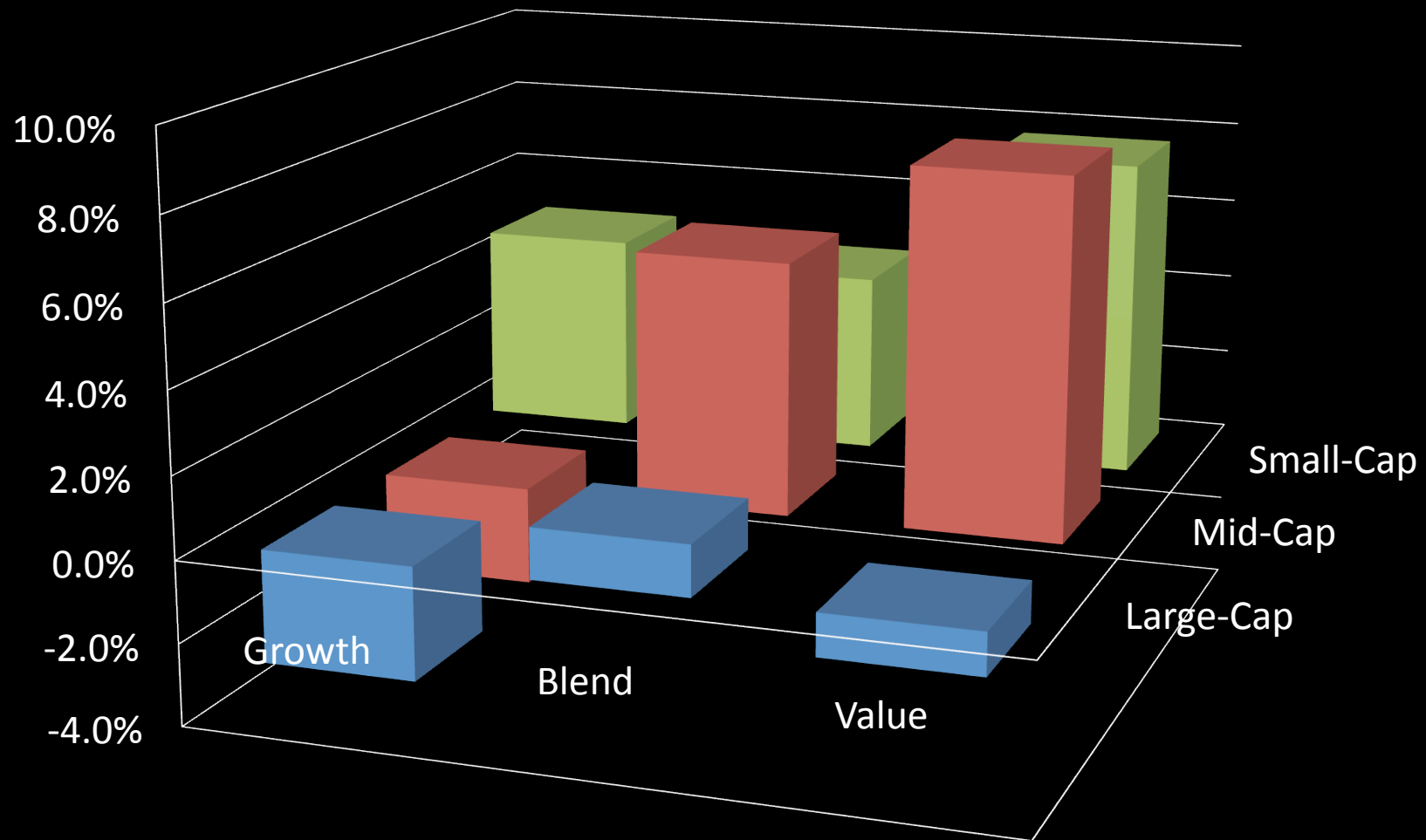


# Who won from 1972-2009

## Growth, Value, Large or Small?



# Who won from 2000-2009, Growth, Value, Large or Small?



# Emerging Markets ETF

Characteristics	VWO	MSCI EMI
Number of stocks	836	748
Median market capitalization	\$14.3B	\$14.8B
Price/earnings ratio	15.2x	14.8x
Price/book ratio	2.0x	1.9x
Return on equity	21.9%	21.1%
Earnings growth rate	15.9%	15.2%
Equity yield	2.1%	2.3%
Turnover rate (last FY)	12.3%	—
Standard deviation (36 mo.)	33.0%	32.6%

Invests in 23 emerging countries in Europe, Asia, Africa, and Latin America.

12 months ending 30 June 2010

# All World Int'l (ex-US) ETF

Characteristics	VEU	FTSE All World (ex-US)
Number of stocks	2,206	2,176
Median market capitalization	\$24.2B	\$24.3B
Price/earnings ratio	16.4x	16.2x
Price/book ratio	1.5x	1.5x
Return on equity	18.3%	18.2%
Earnings growth rate	4.8%	4.8%
Turnover rate (last FY)	9.4%	—
Standard deviation (36 mo.)	26.7%	26.0%

12 months ending 30 June 2010



# Small-Cap ETF

Characteristics	VB	MSCI US Small Cap 1750 Index
Number of stocks	1,753	1,750
Median market capitalization	\$1.3B	\$1.3B
Price/earnings ratio	26.0x	26.0x
Price/book ratio	1.7x	1.7x
Return on equity	10.6%	10.6%
Earnings growth rate	5.4%	5.4%
Foreign holdings	0.2%	—
Turnover rate (last FY)	13.7%	—
Standard deviation (36 mo.)	26.8%	26.8

12 months ending 30 June 2010

# MEASURING RISK

# Standard Deviation

- Standard deviation or sigma ( $\sigma$ )
  - 68% of the values in distribution are within 1 standard deviation of the mean
  - Examples (over 35 years)
    - S&P 500: 17.5%
    - Lehman Brothers Aggregate Bond fund: 5.2%
    - T-bills: 3.1%
- Standard deviation is a measure of volatility
- Risk is a broader concept. Will my money be there when I need it?

# Value vs. Growth

- Index funds use quantitative approaches to characterize stocks as either growth or value
- No one asset class consistently out performs
- Academic research suggests that value stocks slightly outperform growth stocks over time
- Combining a “blended” index with a value index gives a slight tilt toward value.

# Large-Cap

## Blend vs. Value vs. Growth

	VV (LCB)	VTV (LCV)	VUG (LVG)
Number of stocks	755	422	428
Median market cap.	\$31.3B	\$38.6B	\$28.5B
Price/earnings ratio	16.5x	15.5x	17.7x
Price/book ratio	1.9x	1.4x	3.0x
Return on equity	20.3%	16.5%	24.5%
Earnings growth rate	6.9%	-0.5%	14.3
Foreign holdings	0.1%	0.1%	0.1%
Turnover rate (last FY)	8.3%	30.6%	29.4%
Std. deviation (36 mo.)	20.3%	21.1%	20.3%

12 months ending 30 June 2010

# Small-Cap

## Blend vs. Value vs. Growth

	VB (SCB)	VBR (SCV)	VBK (SVG)
Number of stocks	1,753	993	1034
Median market cap	\$1.3B	\$1.3B	\$1.3B
Price/earnings ratio	26.0x	20.3x	35.9x
Price/book ratio	1.7x	1.3x	2.5x
Return on equity	10.6%	8.9%	12.7%
Earnings growth rate	5.4%	0.7%	11.0%
Foreign holdings	0.2%	0.1%	0.2%
Turnover rate (last FY)	13.7%	32.5%	37.8%
Std. deviation (36 mo.)	26.8%	27.6%	26.7%

12 months ending 30 June 2010

# Correlation Among Asset Classes

- Asset classes that are not closely correlated can reduce portfolio volatility
  - *e.g.*, some asset classes increase in value while others decrease
- 2009 bear market caused most asset classes to decline
- How many asset classes are enough?
  - 6-10 can provide excellent diversification
- Look across your entire portfolio

# Callan Periodic Table of Returns

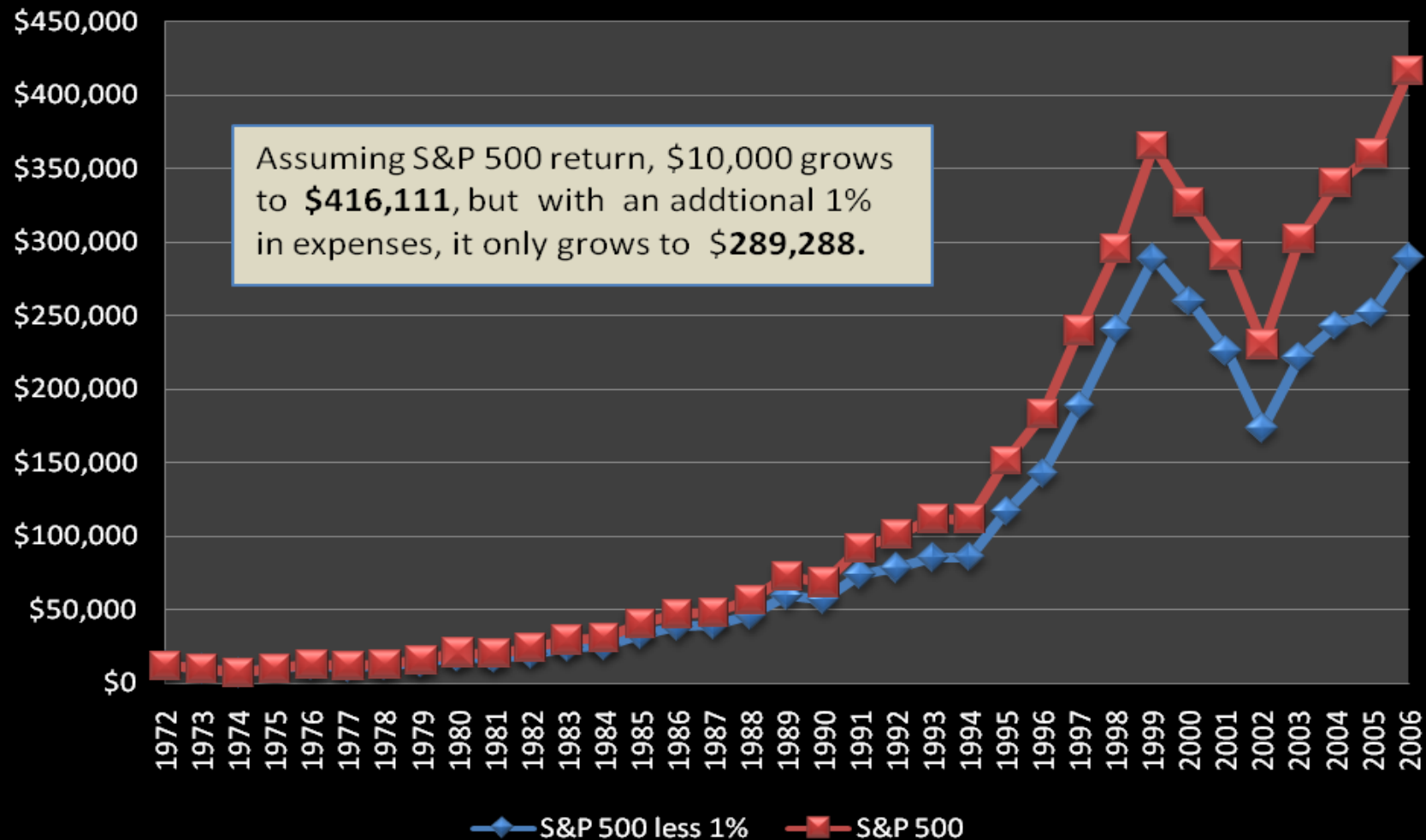
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BC Agg 8.96%	Russell 2000 Growth 51.19%	Russell 2000 Value 29.14%	MSCI EAFE 32.57%	MSCI EAFE 7.78%	S&P/Citi 500 Growth 38.13%	S&P/Citi 500 Growth 23.97%	S&P/Citi 500 Growth 36.52%	S&P/Citi 500 Growth 42.16%	Russell 2000 Growth 43.09%	Russell 2000 Value 22.83%	Russell 2000 Value 14.02%	BC Agg 10.26%	Russell 2000 Growth 48.54%	Russell 2000 Value 22.25%	MSCI EAFE 13.54%	MSCI EAFE 26.34%	MSCI EAFE 11.17%	BC Agg 5.24%	Russell 2000 Growth 34.47%
S&P/Citi 500 Growth 0.20%	Russell 2000 46.04%	Russell 2000 Value 18.41%	Russell 2000 Value 23.77%	S&P/Citi 500 Growth 3.13%	S&P 500 37.58%	S&P 500 22.96%	S&P 500 33.36%	S&P 500 28.58%	S&P/Citi 500 Growth 28.24%	BC Agg 11.63%	BC Agg 8.43%	Russell 2000 Value -11.43%	Russell 2000 47.25%	MSCI EAFE 20.25%	S&P/Citi 500 Value 5.82%	Russell 2000 Value 23.48%	S&P/Citi 500 Growth 9.13%	Russell 2000 Value -28.92%	MSCI EAFE 31.78%
S&P 500 -3.11%	Russell 2000 Value 41.70%	S&P/Citi 500 Value 10.52%	Russell 2000 18.88%	S&P 500 1.32%	S&P/Citi 500 Value 36.99%	S&P/Citi 500 Value 22.00%	Russell 2000 Value 31.78%	MSCI EAFE 20.00%	MSCI EAFE 26.96%	S&P/Citi 500 Value 6.08%	Russell 2000 2.49%	MSCI EAFE -15.94%	Russell 2000 Value 46.03%	Russell 2000 18.33%	S&P 500 4.91%	S&P/Citi 500 Value 20.81%	Russell 2000 Growth 7.05%	Russell 2000 -33.79%	S&P/Citi 500 Growth 31.57%
S&P/Citi 500 Value -6.85%	S&P/Citi 500 Growth 38.37%	Russell 2000 Growth 7.77%	S&P/Citi 500 Value 18.61%	S&P/Citi 500 Value -0.64%	Russell 2000 Growth 31.04%	Russell 2000 Value 21.37%	S&P/Citi 500 Value 29.98%	S&P/Citi 500 Value 14.69%	Russell 2000 21.26%	Russell 2000 -3.02%	Russell 2000 Growth -9.23%	Russell 2000 -20.48%	MSCI EAFE 38.59%	S&P/Citi 500 Value 15.71%	Russell 2000 Value 4.71%	Russell 2000 18.37%	BC Agg 6.97%	S&P/Citi 500 Growth -34.92%	Russell 2000 27.17%
Russell 2000 Growth -17.42%	S&P 500 30.47%	S&P 500 7.62%	Russell 2000 Growth 13.37%	Russell 2000 Value -1.54%	Russell 2000 28.45%	Russell 2000 16.49%	Russell 2000 22.36%	BC Agg 8.70%	S&P 500 21.04%	S&P 500 -9.11%	S&P/Citi 500 Value -11.71%	S&P/Citi 500 Value -20.85%	S&P/Citi 500 Value 31.79%	Russell 2000 Growth 14.31%	Russell 2000 4.55%	S&P 500 15.79%	S&P 500 5.49%	S&P 500 -37.00%	S&P 500 26.47%
Russell 2000 -19.48%	S&P/Citi 500 Value 22.56%	BC Agg 7.40%	S&P 500 10.08%	Russell 2000 -1.82%	Russell 2000 Value 25.75%	Russell 2000 Growth 11.26%	Russell 2000 Growth 12.95%	Russell 2000 Growth 1.23%	S&P/Citi 500 Value 12.73%	MSCI EAFE -14.17%	S&P 500 -11.89%	S&P 500 -22.10%	S&P 500 28.68%	S&P 500 10.88%	Russell 2000 Growth 4.15%	Russell 2000 Growth 13.35%	S&P/Citi 500 Value 1.99%	Russell 2000 Growth -38.54%	S&P/Citi 500 Value 21.17%
Russell 2000 Value -21.77%	BC Agg 16.00%	S&P/Citi 500 Growth 5.06%	BC Agg 9.75%	Russell 2000 Growth -2.43%	BC Agg 18.46%	MSCI EAFE 6.05%	BC Agg 9.64%	Russell 2000 -2.55%	BC Agg -0.82%	S&P/Citi 500 Growth -22.08%	S&P/Citi 500 Growth -12.73%	S&P/Citi 500 Growth -23.59%	S&P/Citi 500 Growth 25.66%	S&P/Citi 500 Growth 6.13%	S&P/Citi 500 Growth 4.00%	S&P/Citi 500 Growth 11.01%	Russell 2000 -1.57%	S&P/Citi 500 Value -39.22%	Russell 2000 Value 20.58%
MSCI EAFE -23.45%	MSCI EAFE 12.14%	MSCI EAFE -12.18%	S&P/Citi 500 Growth 1.68%	BC Agg -2.92%	MSCI EAFE 11.21%	BC Agg 3.64%	MSCI EAFE 1.78%	Russell 2000 Value -6.45%	Russell 2000 Value -1.49%	Russell 2000 Growth -22.43%	MSCI EAFE -21.44%	Russell 2000 Growth -30.26%	BC Agg 4.10%	BC Agg 4.34%	BC Agg 2.43%	BC Agg 4.33%	Russell 2000 Value -9.78%	MSCI EAFE -43.38%	BC Agg 5.93%



# Expenses and Impact on Return

- Typical Fees
  - Index funds: 0.1% to 0.3%
  - Actively managed funds: No limit (typically 0.7% to 1.5%)
- If you don't buy a mutual fund directly, you may have to pay some brokers fees
- Never pay a front end load or a 12b1 fee, unless you just like enriching strangers
- 1% really matters! (See next chart.)

## Growth of \$10,000 Portfolio 1972-2006



**1% a year really matters!**

# International Index Funds

- US now only accounts for less than 40% of the world equity market
- Developed countries
- Emerging markets
- Geographic regions (Europe and Pacific)
- Note: may be hard to find international small cap and value index funds

# International Asset Classes

- Decide on overall allocation (e.g., 30-45%)
- Diversify within international asset class
  - Approach 1: Developed and Emerging Markets
    - FTSE All-World ex-US + Emerging Market
  - Approach 2: Regions and emerging market
    - Europe, Pacific, emerging markets, and BRIC countries
  - Approach 3: Use a style-based approach
    - LCB, LCV, SCB, SCV, etc. (DFA offers these types of funds through its exclusive agents -- but it is not clear that it is worth the extra effort and the extra fees)
  - Vanguard funds, Vanguard ETFs, and iShares ETFs offer comprehensive choices with low fees

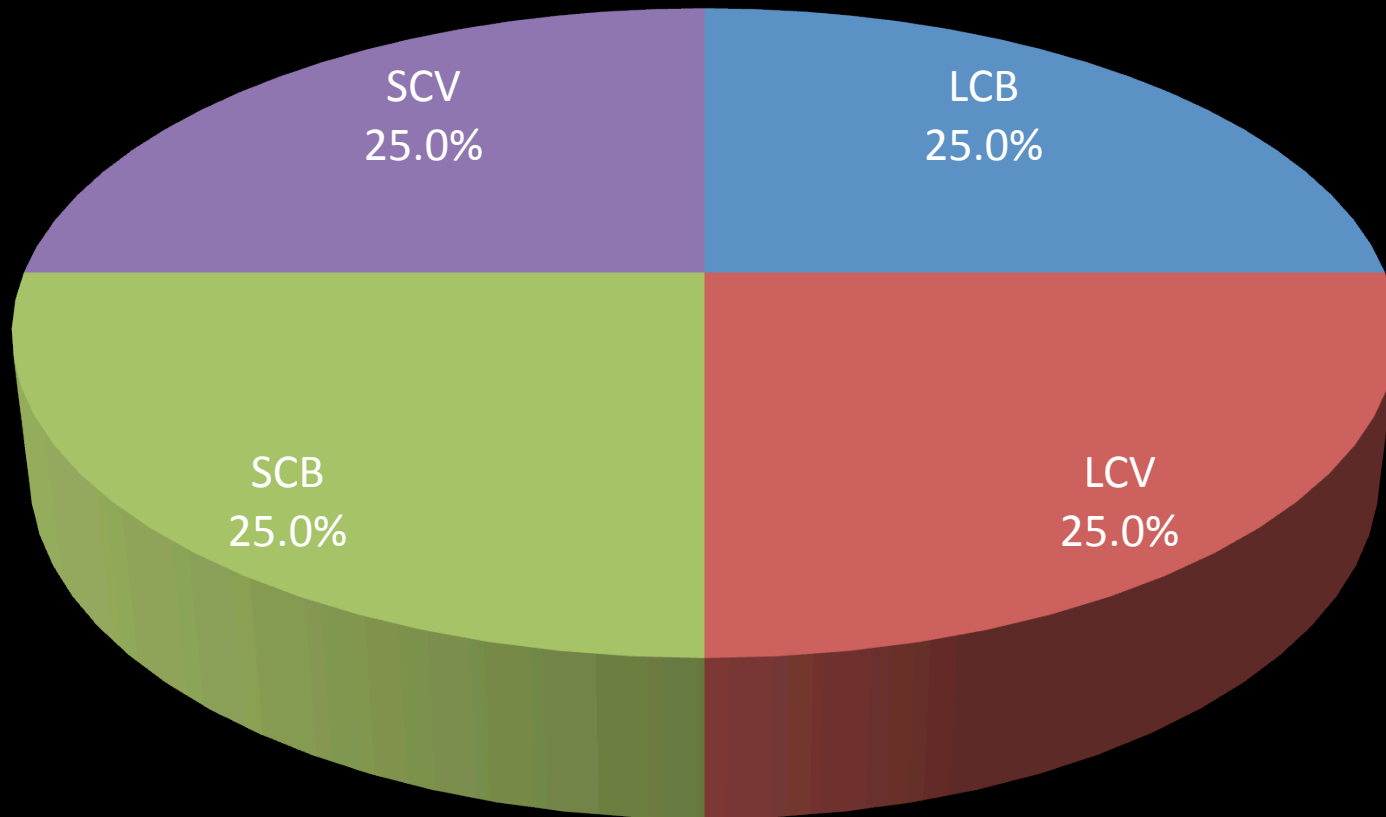
# Other Asset Classes

- REITs are not currently in favor but are a good way to have some real estate exposure
  - Now may be a good time to buy
  - Limit exposure to 5-10% of portfolio
  - Consider int'l REIT e.g., Wisdom Tree DRW
- Consider other asset classes
  - Look asset classes that do not have high correlation with the domestic stock market
  - Examples: commodities (e.g., timber) or gold
    - There are ETFs for these other asset classes
    - Expense ratios are higher for these asset classes

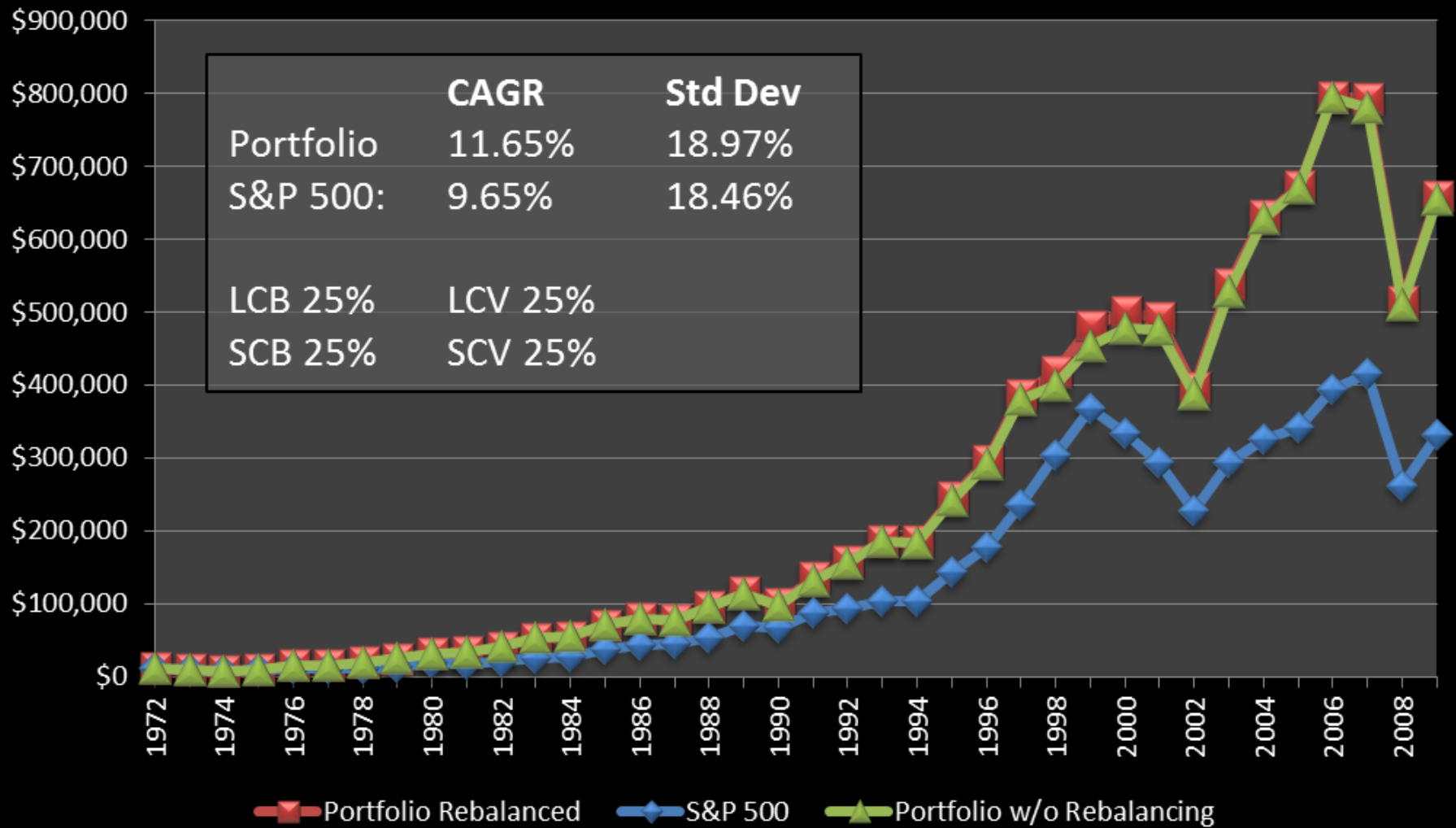
# Cost of Living in 1972

- Yearly US inflation rate 3.27%
- Average cost of new house \$27,550
- Average income per year \$11,800
- Average monthly rent \$165
- Average price for new car \$3,247
- Gas per gallon 55 cents
- Kodak pocket camera \$28
- Wrangler jeans \$12
- Ladies Timex watch \$30 + up

## US Equities Only

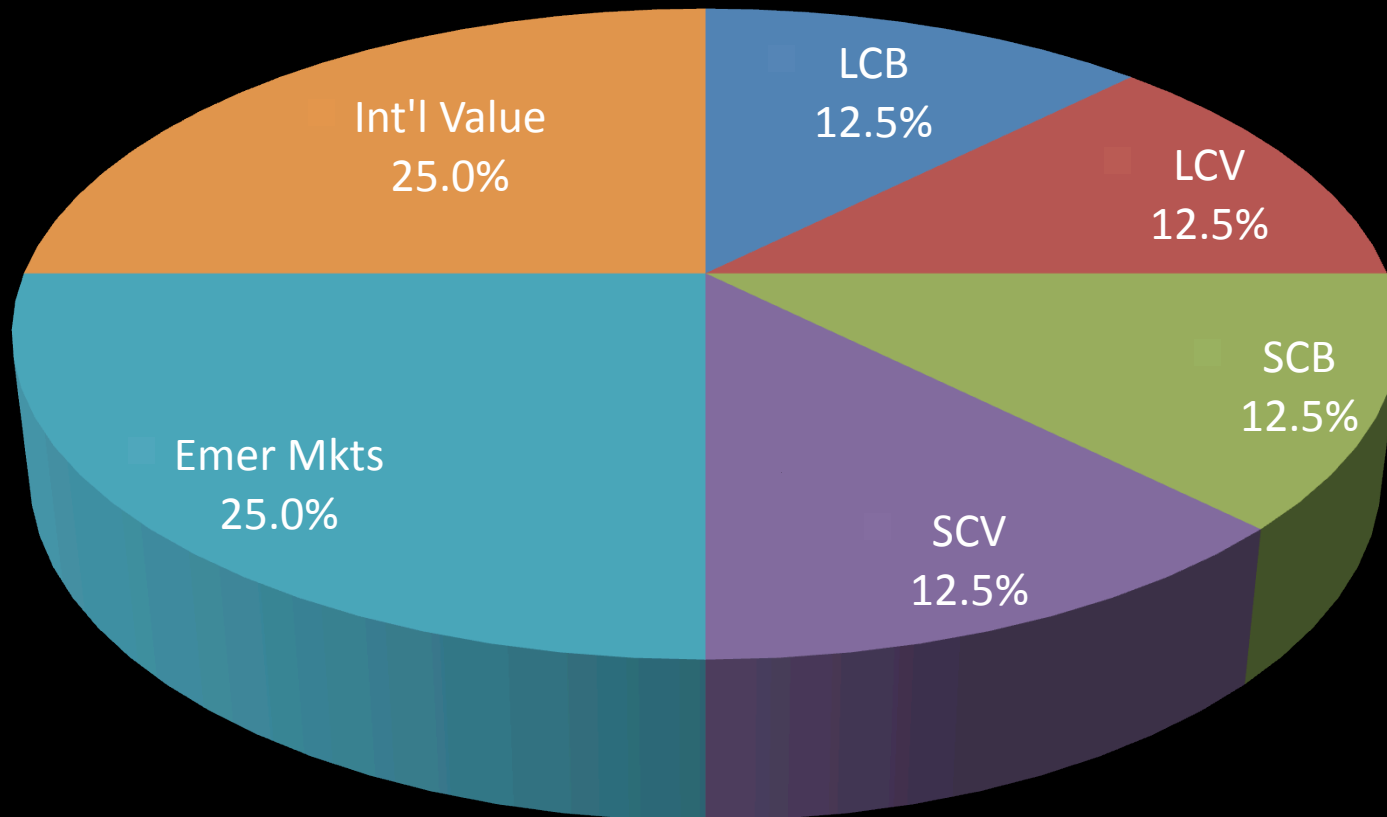


## Growth of \$10,000 from 1972 - 2009

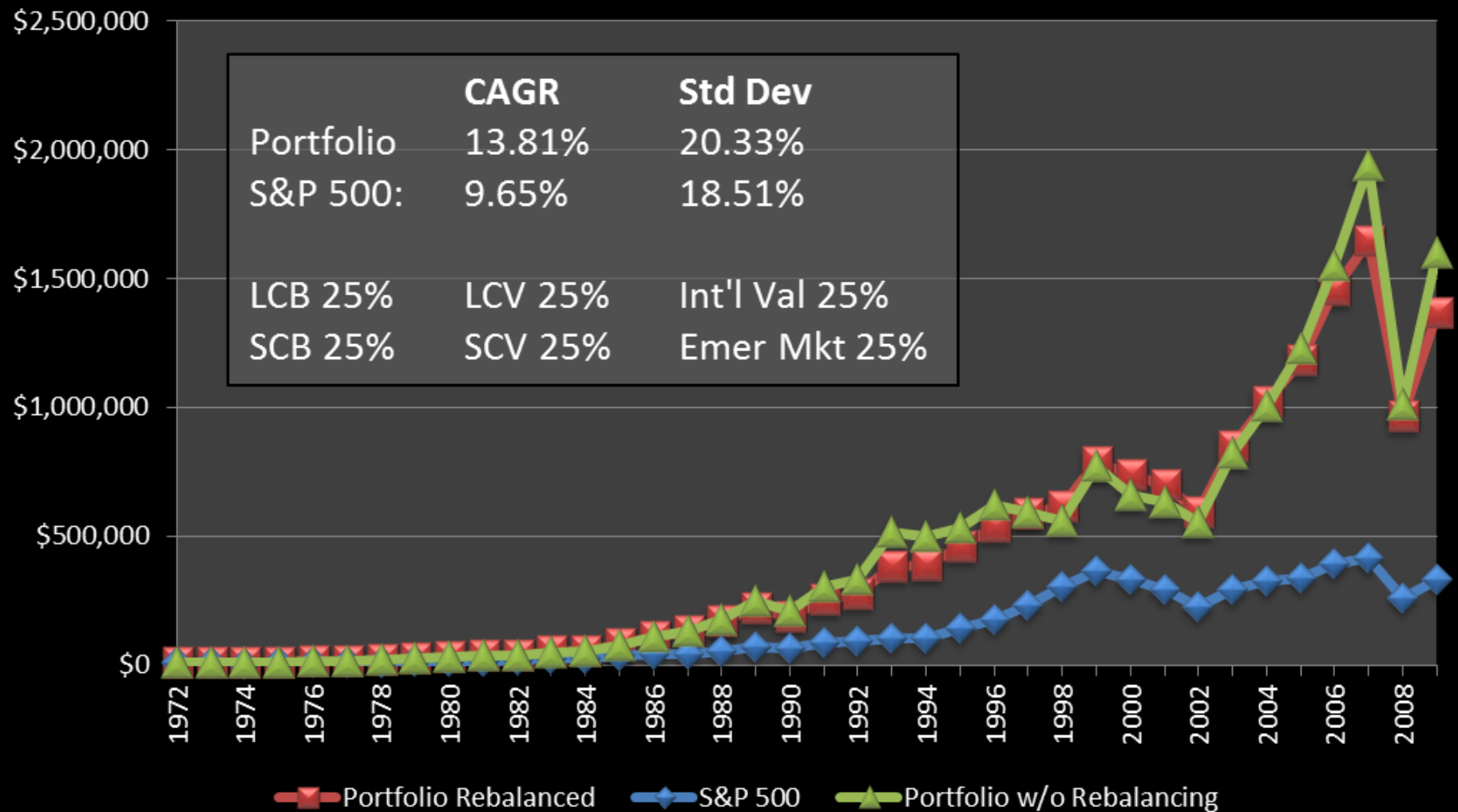




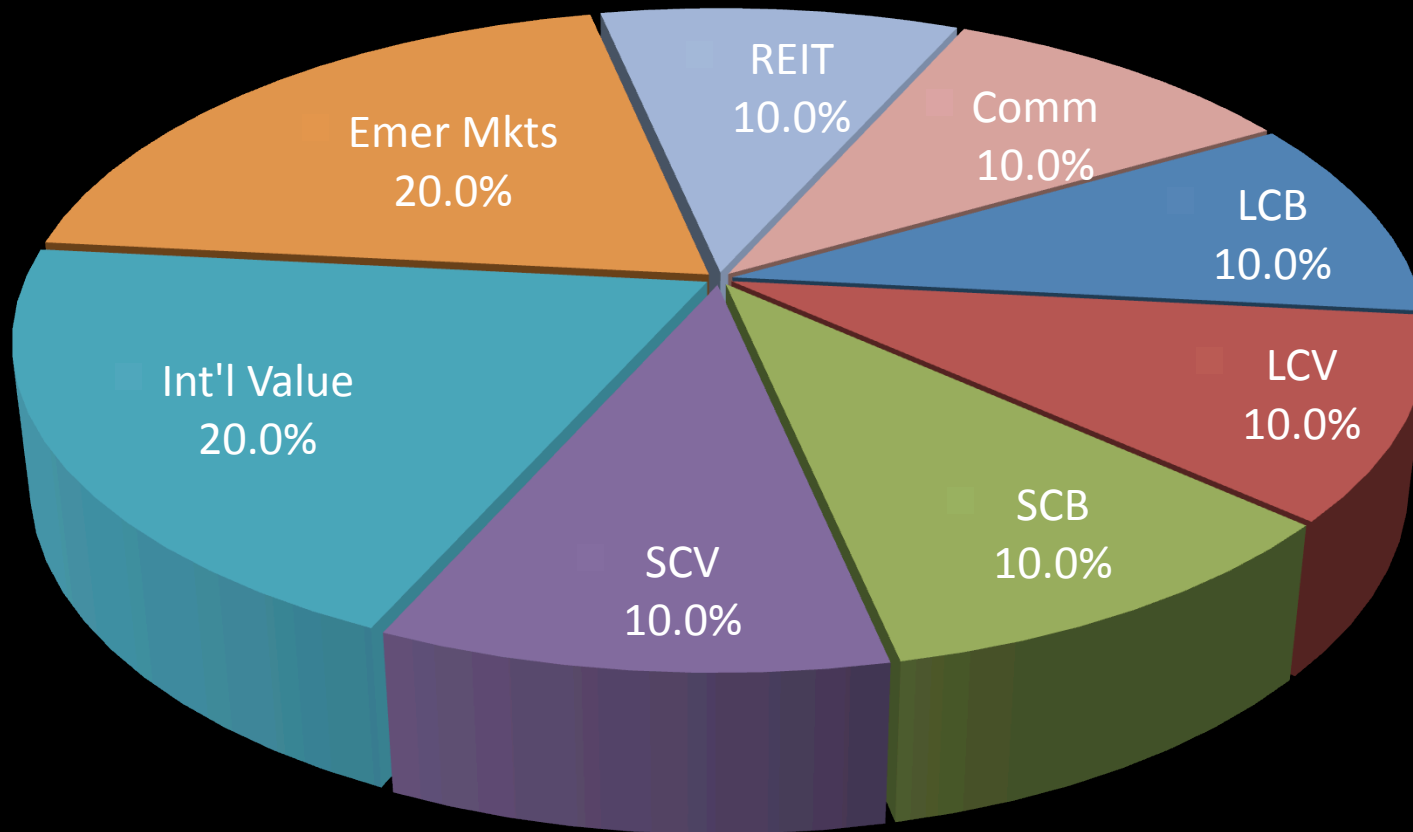
## US and International Equities



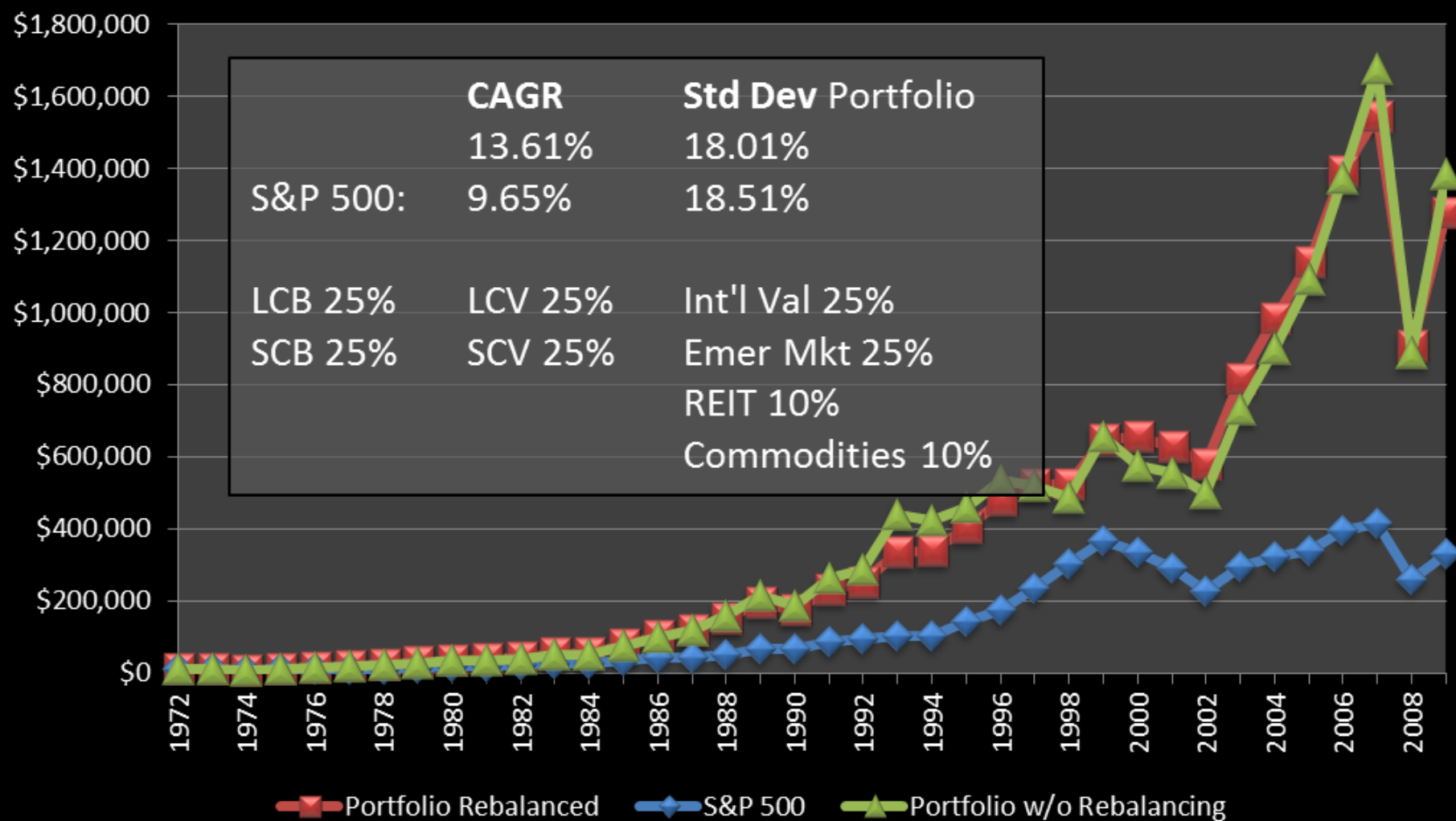
## Growth of \$10,000 from 1972 - 2009



## US, Int'l , REIT & Commodity ETFs



## Growth of \$10,000 from 1972 - 2009



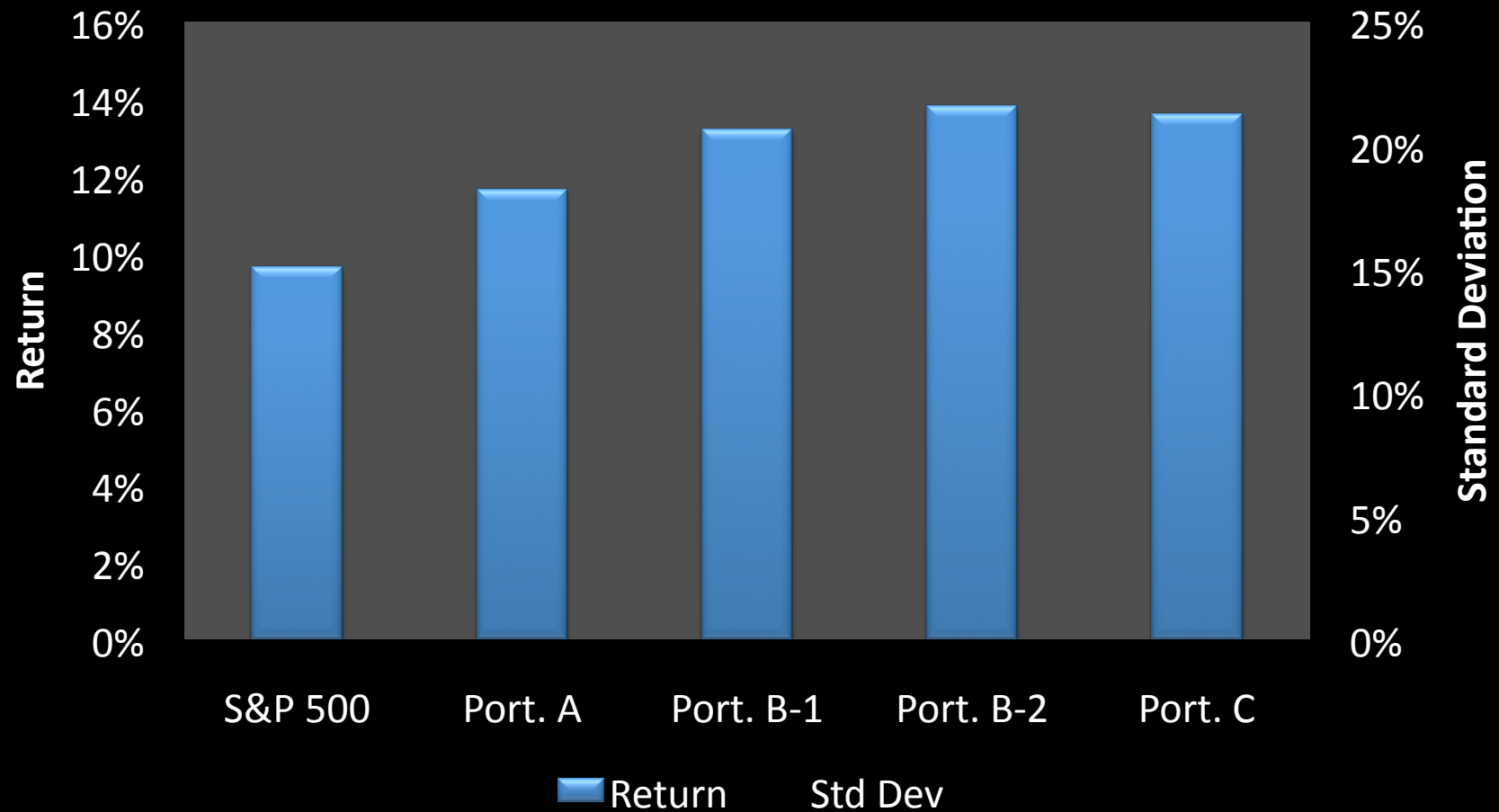
# **SUMMARIZING RISK AND RETURN**

# Portfolio Returns from 1972-2009

	<b>S&amp;P 500</b>	<b>Portfolio A</b> <u>25% each:</u> LCB, LCV, SCV, SCB	<b>Portfolio B-1</b> <u>12.5% each:</u> LCB, LCV, SCV, SCB <u>25% each:</u> Intl Dev Mkt Intl Em Mkt	<b>Portfolio B-2</b> <u>12.5% each:</u> LCB, LCV, SCV, SCB <u>25% each:</u> Intl Value Intl Em Mkt	<b>Portfolio C</b> <u>10% each:</u> LCB, LCV, SCV, SCB <u>20% each:</u> Intl Value Intl Em Mkt <u>10% each:</u> REIT, Comm
<b>Standard Deviation</b>	<b>18.51%</b>	<b>18.97%</b>	<b>20.30%</b>	<b>20.33%</b>	<b>18.01%</b>
<b>CAGR</b>	<b>9.65%</b>	<b>11.65%</b>	<b>13.20%</b>	<b>13.81%</b>	<b>13.61%</b>
<b>\$10,000 becomes</b>	<b>\$331,138</b>	<b>\$657,781</b>	<b>\$1,111,422</b>	<b>\$1,364,792</b>	<b>\$1,275,004</b>

**Asset Allocation Increases Return and Reduces Risk**

# Return and Risk (1972-2009)



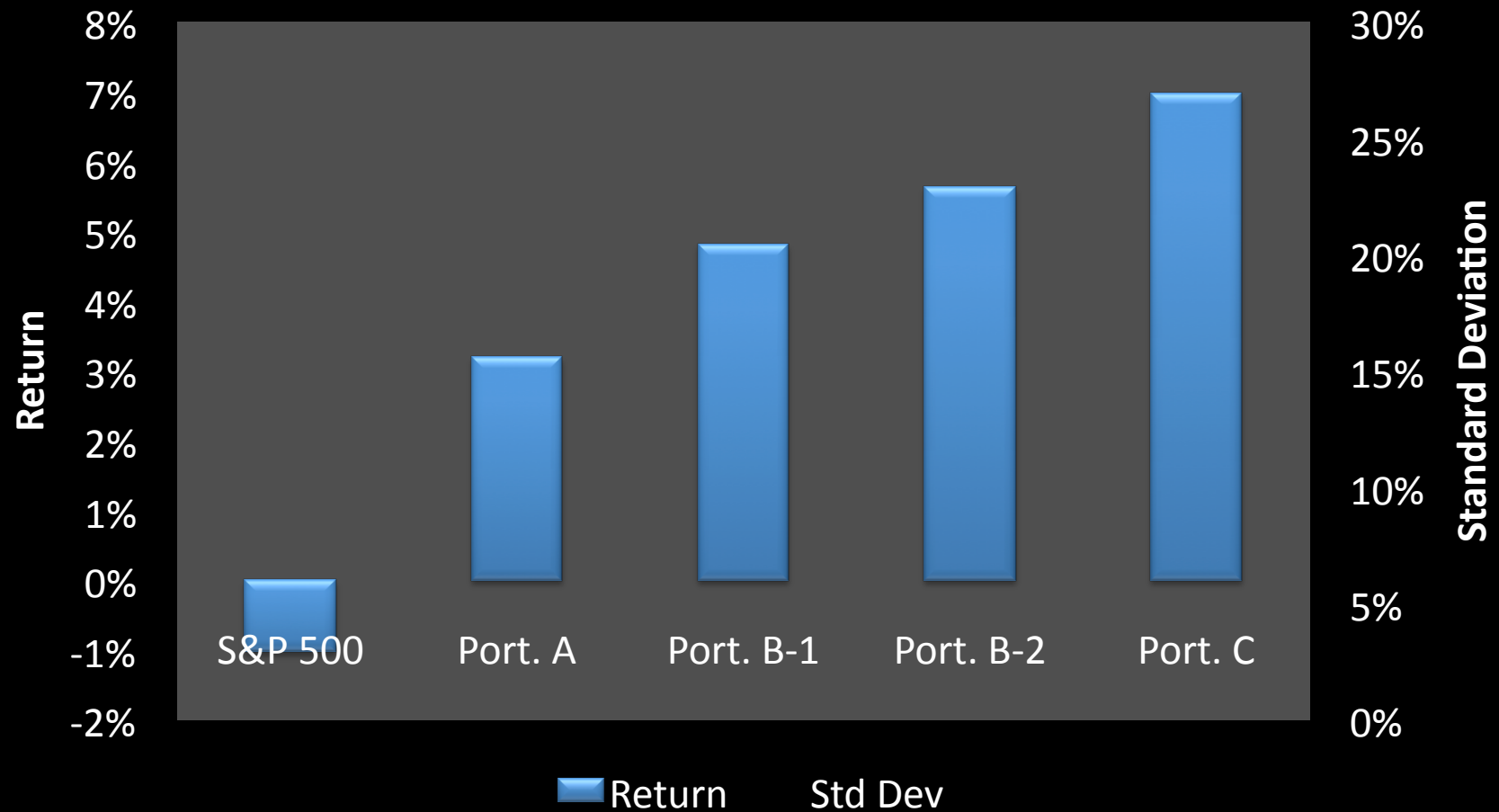
# Portfolio Returns from 2000-2009

	<b>S&amp;P 500</b>	<b>Portfolio A</b> <u>25% each:</u> LCB, LCV, SCV, SCB	<b>Portfolio B-1</b> <u>12.5% each:</u> LCB, LCV, SCV, SCB <u>25% each:</u> Intl Dev Mkt Intl Em Mkt	<b>Portfolio B-2</b> <u>12.5% each:</u> LCB, LCV, SCV, SCB <u>25% each:</u> Intl Value Intl Em Mkt	<b>Portfolio C</b> <u>10% each:</u> LCB, LCV, SCV, SCB <u>20% each:</u> Intl Value Intl Em Mkt <u>10% each:</u> REIT, Comm
<b>Standard Deviation</b>	<b>21.08%</b>	<b>21.35%</b>	<b>26.03%</b>	<b>26.10%</b>	<b>24.39%</b>
<b>CAGR</b>	<b>-1.03%</b>	<b>3.19%</b>	<b>4.81%</b>	<b>5.63%</b>	<b>6.97%</b>
<b>\$10,000 becomes</b>	<b>\$9,016</b>	<b>\$13,689</b>	<b>\$16,001</b>	<b>\$17,290</b>	<b>\$19,622</b>

**Asset allocation is only the “free lunch” in investing**



# Return and Risk (2000-2009)



# **USING BONDS TO REDUCE RISK**

# Bonds as an Asset Class

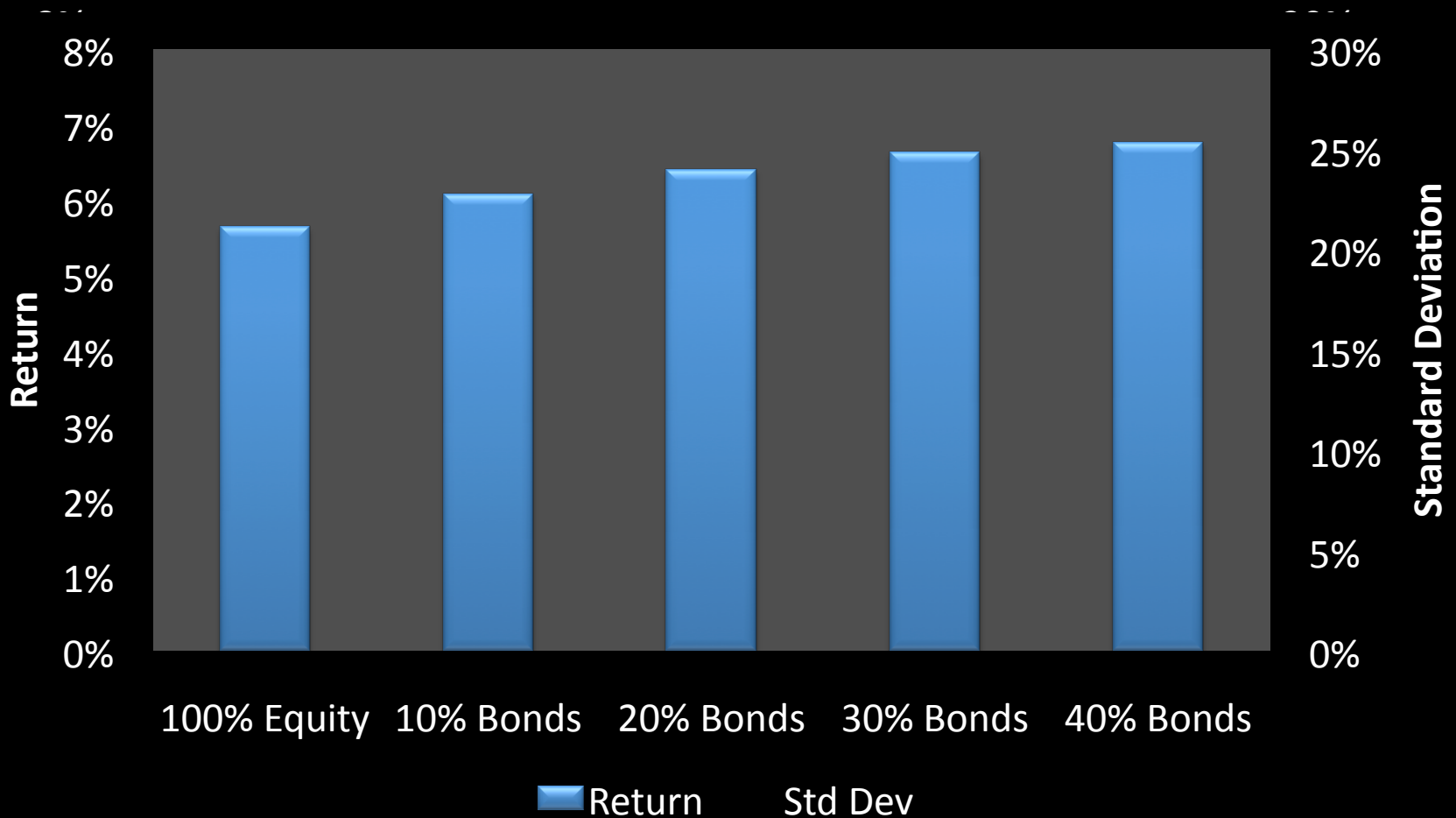
- Return on bonds from 1972-2009
  - 5 yr T-Bills 7.89%
  - 2 yr treasuries 7.36%
  - Total bond index 7.78%
- Return on bonds from 2000-2009
  - 5 yr T-Bills 6.72%
  - 2 yr treasuries 4.92%
  - Total bond index 6.06%

# Adding Fixed Income Assets

- 10% - 40% depending on your risk profile
- Reduces portfolio volatility
- Slightly lowers return
- Should focus on short and intermediate terms bonds or money market funds
- Bond funds vs. bond ladders
- Watch bond fund expenses very carefully as you can't make them up in performance

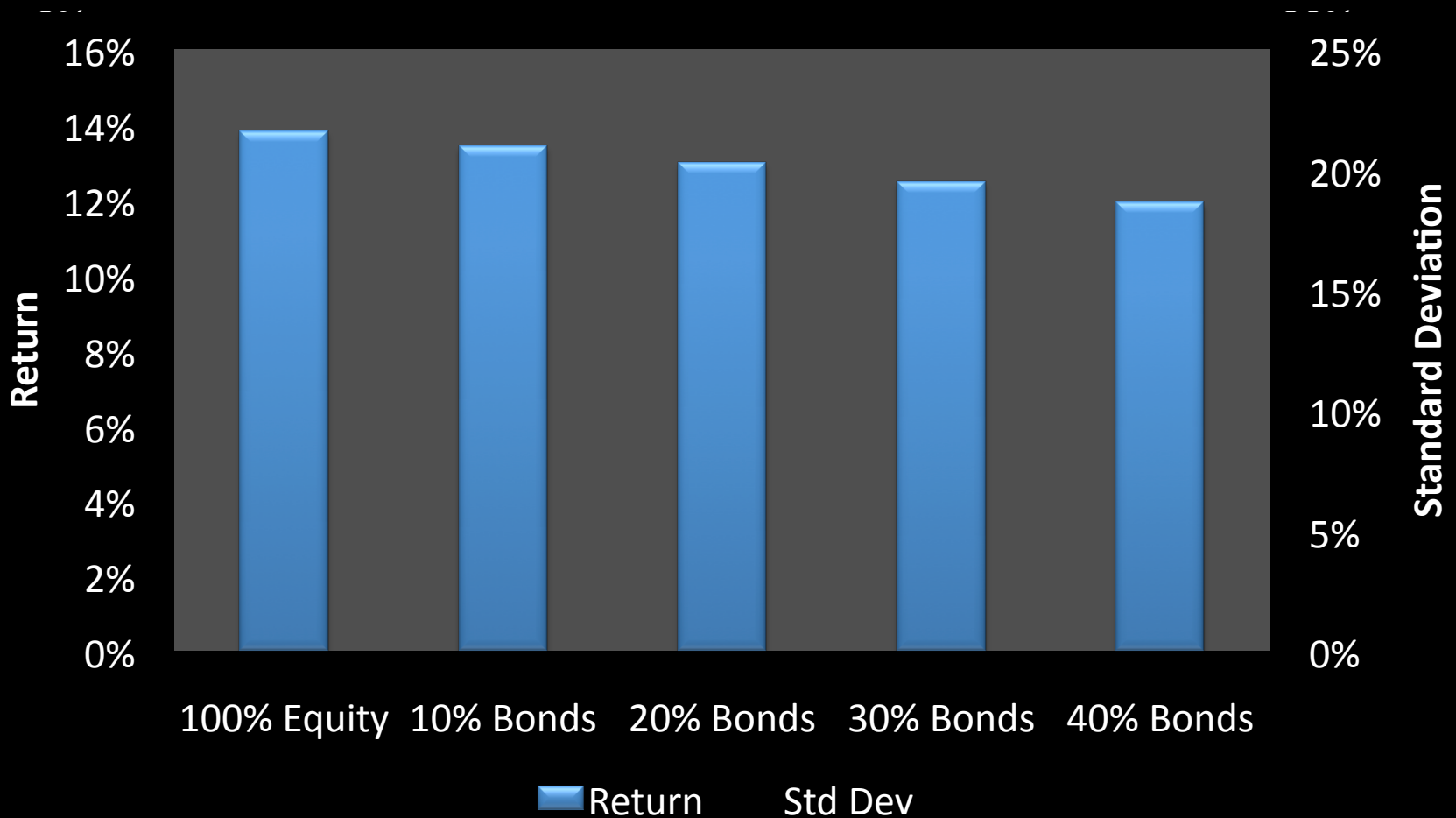
# Adding Bonds (2000-2009)

Equally weighted US and Int'l Equities (Portfolio B-2)



# Adding Bonds (1972-2009)

Equally weighted US and Int'l Equities (Portfolio B-2)



# **BUILDING A CORE PORTFOLIO**

# Creating an Index Fund / ETF Portfolio

- Decide on overall asset allocations
- Determine your personal risk profile
  - Used fixed income assets to reduce risk
- If you own stocks or mutual funds decide whether to replace them or include them
  - Morningstar x-ray will break down the asset classes in your mutual funds
  - Asset class for stocks are easily to find
- Implement portfolio at one time



# Other Considerations

- Most index funds have a minimum, e.g., \$3,000
- Expenses for ETFs are generally a few basis points lower than index funds
- Vanguard and Schwab do not charge brokerage fees for their ETFs

# Model Portfolios

Index Fund / ETF	Ticker	Port A	Port B-1	Port B-2	Port C
Large Cap Value – LCV	VIVAX / VTV	25%	12.5%	12.5%	10%
Large Cap Blend – LCB	VFINX / VV	25%	12.5%	12.5%	10%
Large Cap Growth - LCG	VIGRX / VUG				
Mid-Cap Blend - MCB	VIMSX / VO				
Small Cap Value - SCV	VISVX / VBR	25%	12.5%	12.5%	10%
Small Cap Blend - SCB	NAESX / VB	25%	12.5%	12.5%	10%
Small Cap Growth - SCG	VISGX / VBK				
Micro Cap	BRSIX / PZI				
REIT	VGSIX / VNQ				10%
Int'l Developed – EAFE	VDMIX / VEU		25%		
Int'l Value	VTRIX			25%	20%
Emerging Mkt - EM	VEIEX / VWO		25%	25%	20%
Commodities	PCRIX / VAW				10%

# Rebalancing Your portfolio

- Frequent rebalancing is not necessary
  - Once a year is probably enough
  - Watch out for short term capital gains
- Rebalancing helps you to sell high and buy low
- Stay with your asset allocation unless you have a good reason to change it
- Never chase returns with your asset allocation
  - Last year's winner is likely to be next year's loser (look at any of the tables of periodic returns)

# Resources

- Books

- The Little Book of Common Sense Investing by John C. Bogle
- A Random Walk Down Wall Street: The Time-Tested Strategy for Successful Investing, 9th Ed. by Burton G. Malkiel
- The Four Pillars of Investing: Lessons for Building a Winning Portfolio by William J. Bernstein

- Spreadsheet

- [Backtesting Spreadsheet](#) from one of the members of the Vanguard Diehards Forum that will back test combinations of index funds from 1972-2009.

- Websites

- [FundAdvice.com](#) - Website for Paul Merriam
- [Bogle Financial Markets Research Center](#)
- [John Bogle's Blog](#)
- [Seeking Alpha](#) - ETF Section
- [Vanguard Diehard's Forum](#)
- [Weekly Podcast](#) by Paul Merriman

# Summary

- Risk and return move inversely
- You can increase portfolio return without increasing risk with multiple asset classes
- You can decrease overall portfolio risk by adding a fixed income component
  - Depends upon your risk profile and when you need to have the funds available
  - Fixed income assets range from 10% - 40%

**BACKUP**

# **INDEX FUNDS AND INDEX-BASED ETFs IN RETIREMENT PLANS**

# What about Life Funds

- Asset mix varies greatly among offerings
- Be sure that the fund does not double up on expenses
- You can get a more precise risk allocation by doing selecting the asset classes yourself
- If you don't want to rebalance your portfolio periodically, then life funds may be for you – just understand what you are getting



# Using Index Funds in 401(k) Plan

- What if my 401(k) does not offer index funds or index-based ETFs?
  - Make noise and complain!
  - Many offered funds have high expenses
- Use mutual funds if you have no alternative
  - Look for lowest cost funds that most closely follow major indices
- Look at 401(k) and non-retirement holdings together to build a portfolio
- Pay attention to overall asset allocation and taxes

# Federal Thrift Savings Plan (TSP)

- Has lowest index fund expense ratio on the planet
- You can build a well diversified portfolio with only three holdings:
  - C Fund (large cap, S&P 500)  $\approx$  SPY or IVV
  - S Fund (small cap, DJW 4500)  $\approx$  VXF
  - I Fund (Int'l, MSCI Europe, Australasia, Far East)  $\approx$  EFA
- You can use the fixed income funds to adjust risk:
  - G Fund (short term government backed securities)

# Model TSP Allocations

- Aggressive (100% equities)
  - 30% C Fund (large cap blend)
  - 30% S Fund (small cap blend)
  - 40% I Fund (international)
- Conservative (70% / 30% equities/fixed income)
  - 21% C Fund (large cap blend)
  - 21% S Fund (small cap blend)
  - 28% I Fund (international)
  - 30% G Fund (government backed securities)