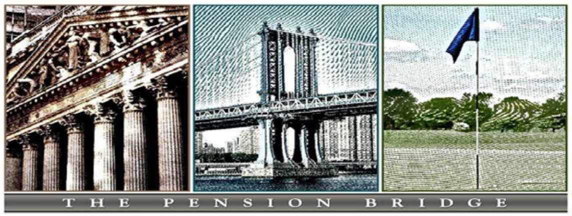
NEPC, LLC

YOU DEMAND MORE. *So do we.*SM



Risk Parity in a Dynamic Asset Allocation Context

2014 Pension Bridge Conference

Richard Charlton, Chairman NEPC, LLC

April 22, 2014

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NEPC Overview

NEPC Business Overview

- **Engaged Partnership**
  - Independent consulting firm since 1986
  - Business model aligned with client interest
  - $800+ Billion in retainer relationships
  - Successful and ongoing ownership transition creates stability

The NEPC Difference

- **Large enough to have significant research and consulting resources**
  - Increasingly complex markets require senior, experienced researchers across all asset classes
  - Forty-seven research professionals
  - Depth of staff and infrastructure equals informed decisions & innovative solutions
- **Specialized to focus solely on client needs**
  - Granular Research/Practice Groups
  - High client touch created through low client to consultant ratio
  - Traditional and alternative assets

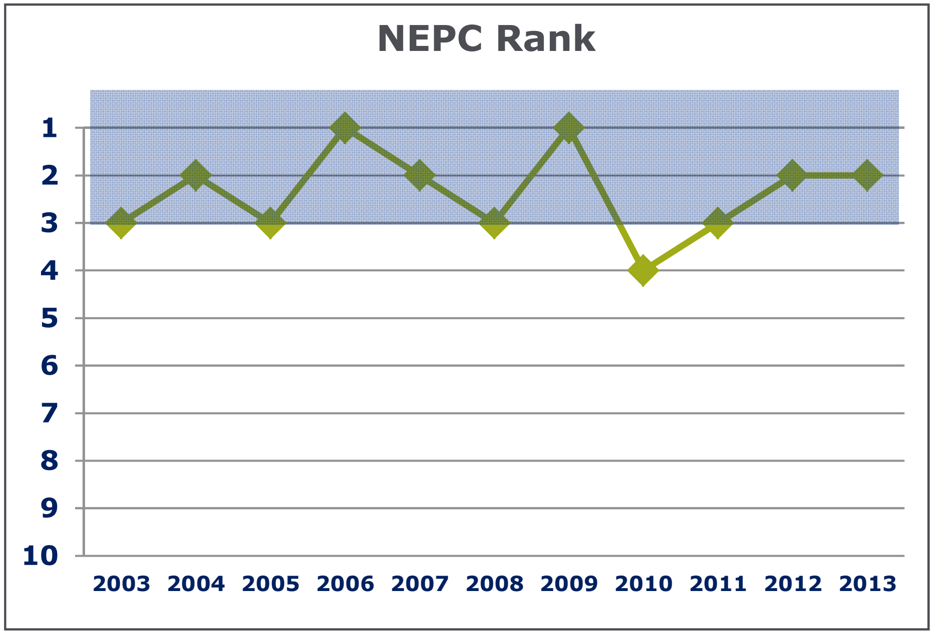
Recent NEPC Awards

- **2013 and 2011 aiCIO Industry Innovation Consultant Awards**
- **2013 and 2012 aiCIO World's 25 Most Influential Investment Consultants**
  - KC Connors, CFA, CAIA, Partner
  - Allan Martin, Partner
- **2012 and 2013: Ranked #2 in overall client satisfaction among the ten largest institutional investment consultants by Greenwich Associates; one of two firms to rank in top three in ten of past eleven years**
- **2012 CAIA Corporate Recognition Award**
- **2012 Investor Excellence award by InvestHedge – Consultant category i**

- **Greenwich Associates surveys ~1,000 large fund sponsors every year, regarding 3 broad areas:**
  - Investment Counseling
  - Manager Selection
  - Client Servicing

- **NEPC is recognized for industry-leading stability and excellence:**
  - Ranked #2 overall in 2013 and 2012*
  - One of only two firms to rank in the top three in 9 of the last 10 years*
  - Ranked #1 for proactive advice and innovative ideas in nine of the last 11 years*
  - Ranked #1 for long-term asset allocation in six of the last 11 years and ranked in the top 3 in 10 of the last 11 years*

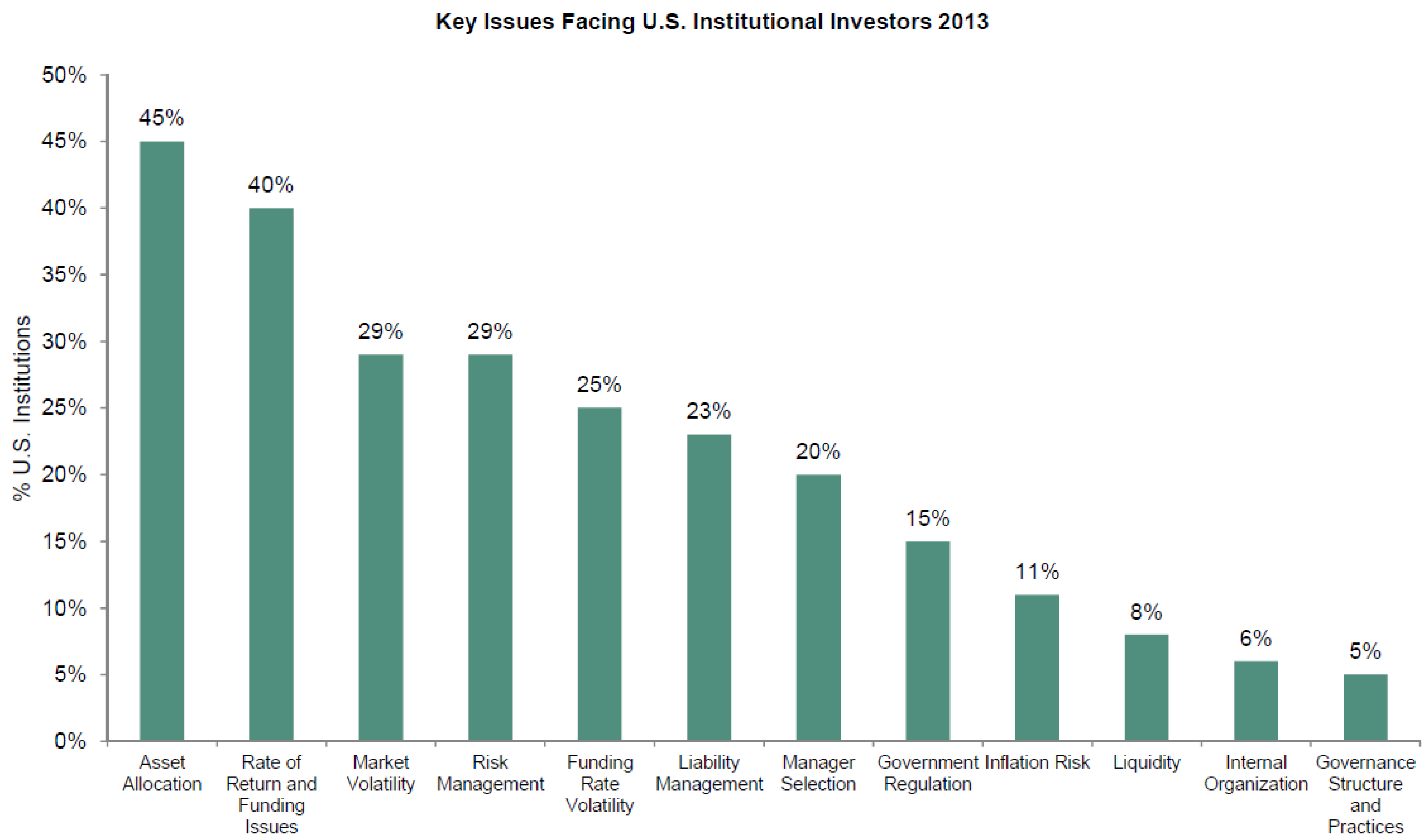
- **Employee compensation is linked to this survey through our Quality Bonus**



NEPC 2013 Ranking among 10 Largest Consulting Firms	
Category	Rank
Understanding Goals and Objectives	#1
Long-term Asset Allocation	#1
Proactive Advice and Innovative Ideas	#1
Capability of Consultant Assigned to Fund	#1
Credibility with Investment Committee	#1
Knowledge of Investment Managers	#1
Cited as Most Important Consultant	#1

* Rankings among 10 largest consulting firms.
Greenwich Associates is an independent research firm that interviews fund sponsors. Their rankings do not represent an endorsement of any consulting firm.

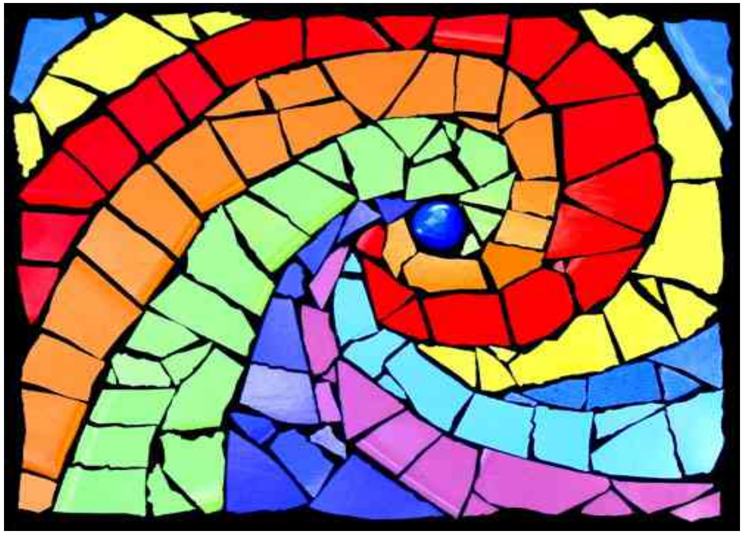
Investors remain focused on allocation and plan level issues



Source: Greenwich Associates 2013, USII-13.

Concepts For Constructing Portfolios

- **Build a Mosaic**
  - No single asset allocation approach or model has all the answers
  - All analytical tools have the potential to provide useful insights but also include shortcomings
  - Minimize these shortcomings by using multiple approaches to build a more robust solution



- **Be Dynamic**
  - Build a long-term strategic allocation that can meet long-term objectives, BUT
  - Look for opportunities to tilt away from the strategic allocation to add value
  - Take advantage of market discrepancies across time horizons and markets

Asset Allocation Frameworks: Be Dynamic

- **Use different approaches to develop investment policy**

- **60/40**
  – Heavily invested in liquid, public equities and core bonds
  – Typically implemented on a constrained basis, elevating risk exposures

- **Risk Parity**
  – Leverage generates improved returns, absolute and risk adjusted
  – Allocates ***risk, rather than returns***, across liquid, global asset classes
  – No alternatives, often structured with limited focus on alpha opportunities

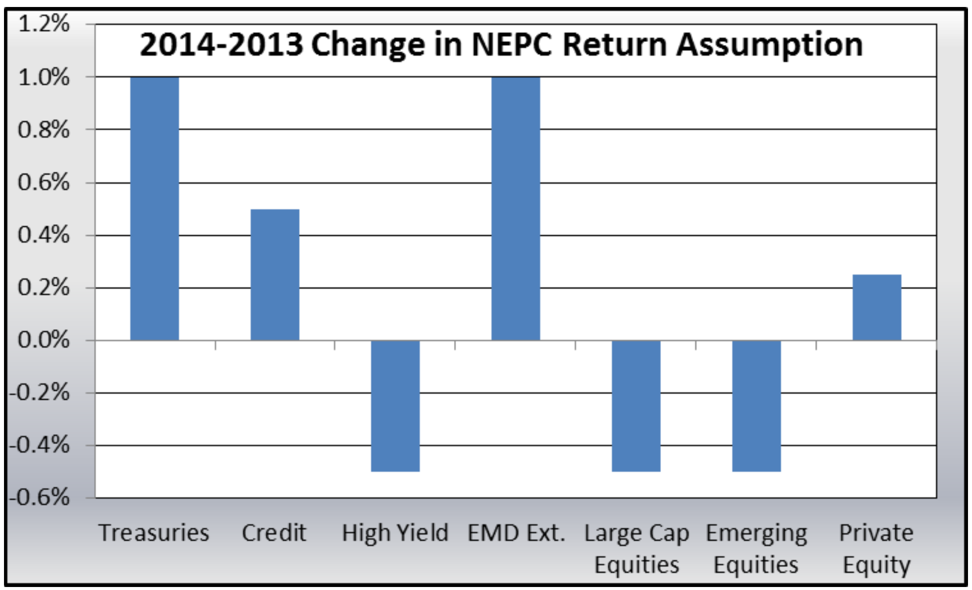
- **Liability-Driven Investing**
  – Fixed income instruments used to immunize liabilities, stabilize funded ratio
  – Primary objectives of matching cash flows and minimizing surplus volatility

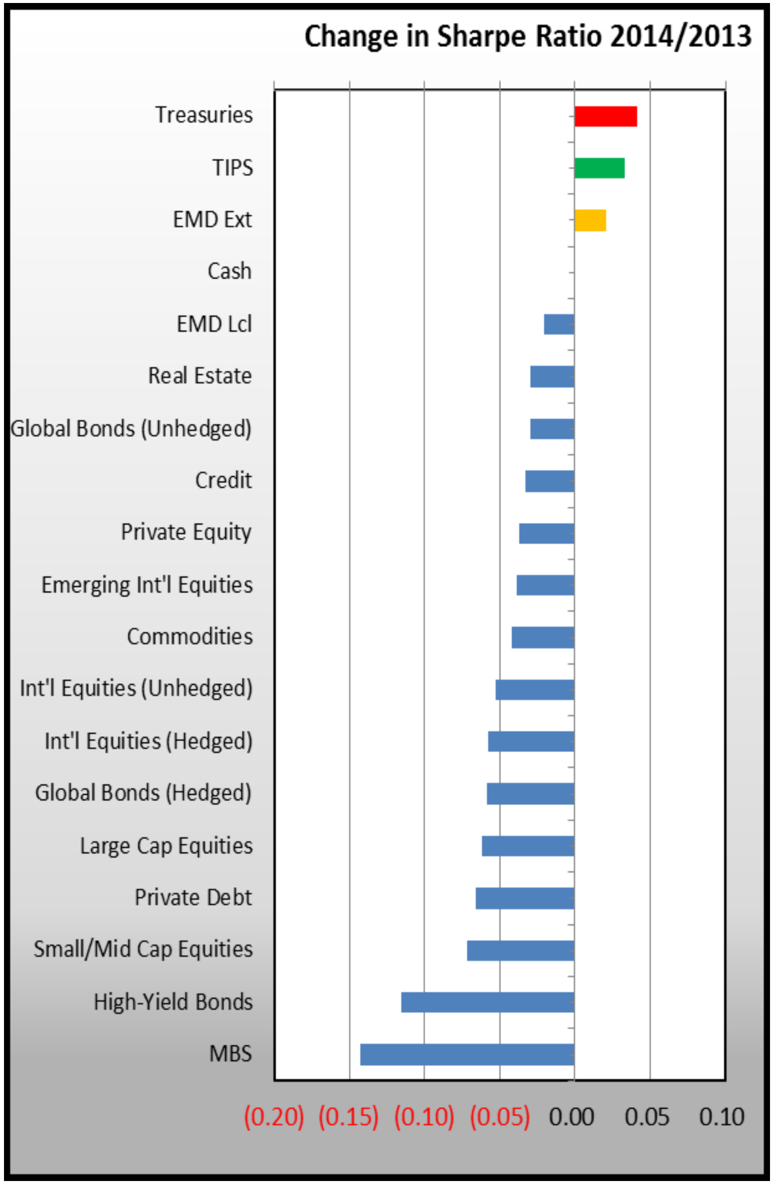
- **Endowment And Healthcare**
  – Heavily focused on alternatives – hedge funds, private equity
  – Use alpha and illiquidity to drive returns incremental to beta exposure

- **Opportunistic**

Dynamic Process Leads to Dynamic Return Expectations

- **Fundamental, asset class forecasts drive a dynamic allocation process**
- **Based on market pricing and economic data, these forecasts reflect *expected* market conditions**
- **They identify opportunities to add value *tactically* while remaining in a *strategic* risk-based framework**





What is Risk Parity?

What is Risk Parity?

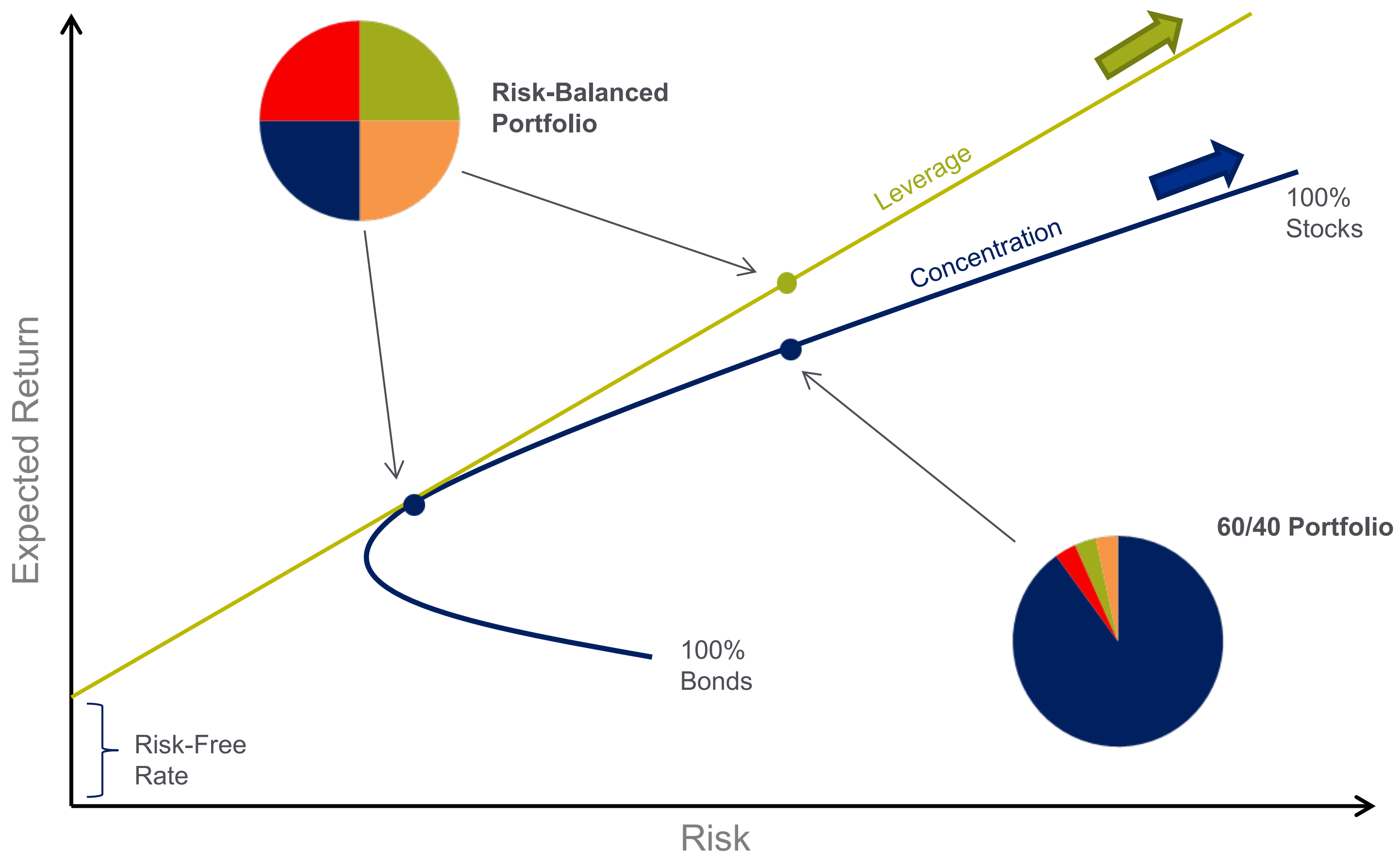
- **Risk Parity is an attractive starting point to balance asset class risk exposures and optimize return expectations**
  - Designed to perform competitively in most economic environments, including rising inflation and stable-to-declining growth environments
  - ***Allocates risk, rather than returns***

- **Risk Parity is a strategic asset allocation concept**
  - Portfolio construction reflects asset class volatilities, correlations, Sharpe ratios, and sensitivity to economic environments
  - Seeks to deliver a balanced and consistent mix of risk premiums
  - Mitigates exposure to a particular dominant risk (typically equity) and limits potential drawdown risk

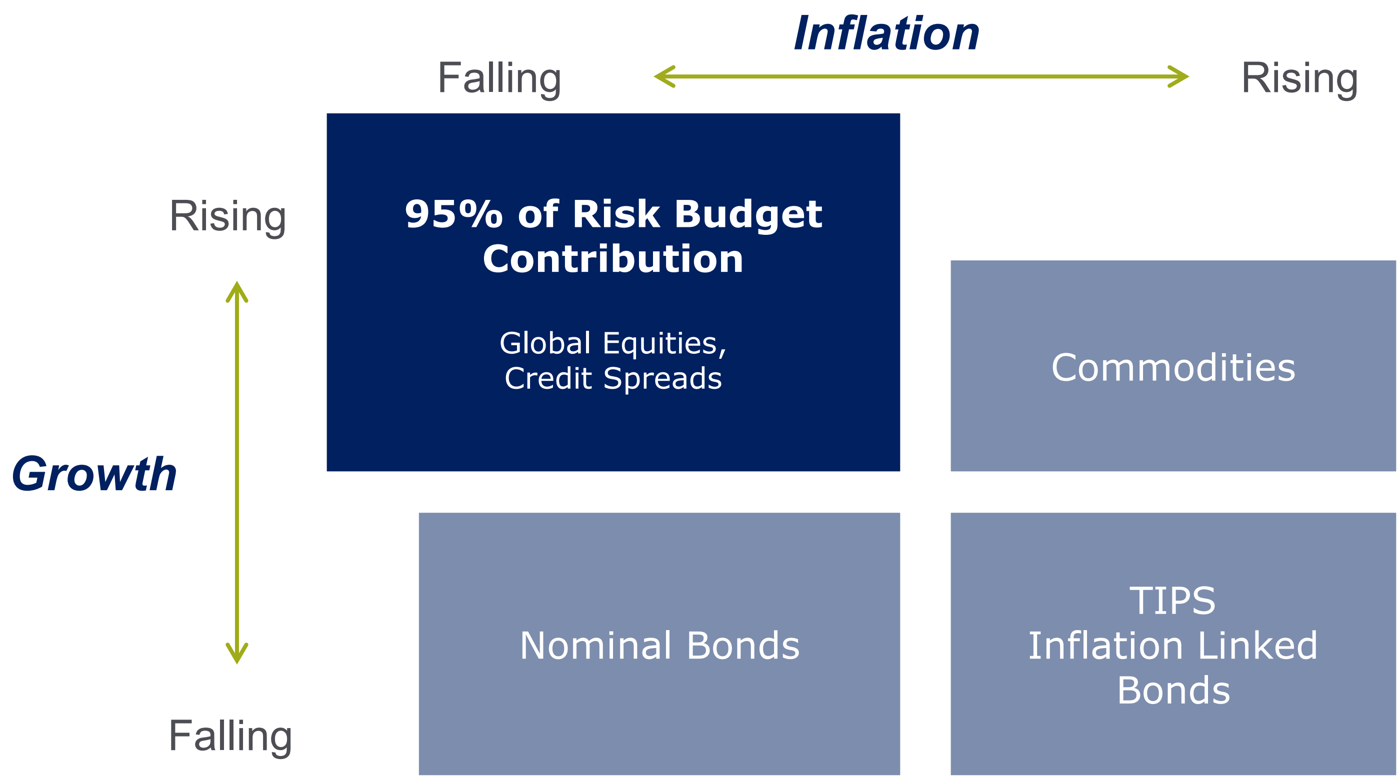
- **Risk Parity provides balanced risk exposures to asset classes with sensitivity to multiple different market environments**
  - Inflation (commodities, inflation-linked bonds)
  - Declining Growth (sovereign bonds, inflation-linked bonds)
  - Rising Growth (equities, credit)

Risk Parity Theory Originates with the Development of the Efficient Frontier

- **Risk Parity uses leverage to improve portfolio risk/return efficiency**
  - More efficient than a traditional asset allocation and less dependent on equity markets
  - Leverage used to improve returns of optimal portfolios, rather than constrained 60/40

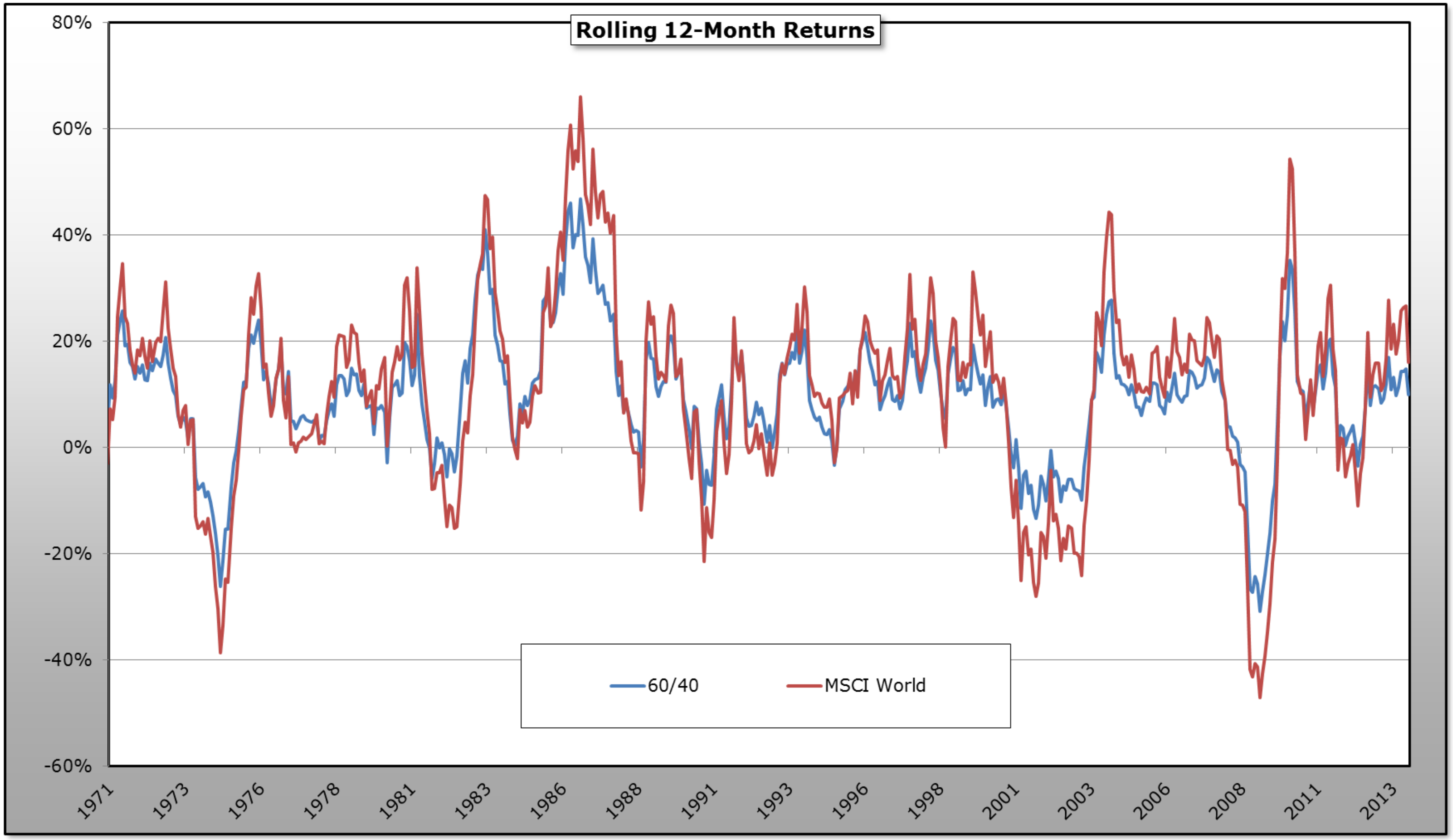


60/40: *A Man For But One Season*



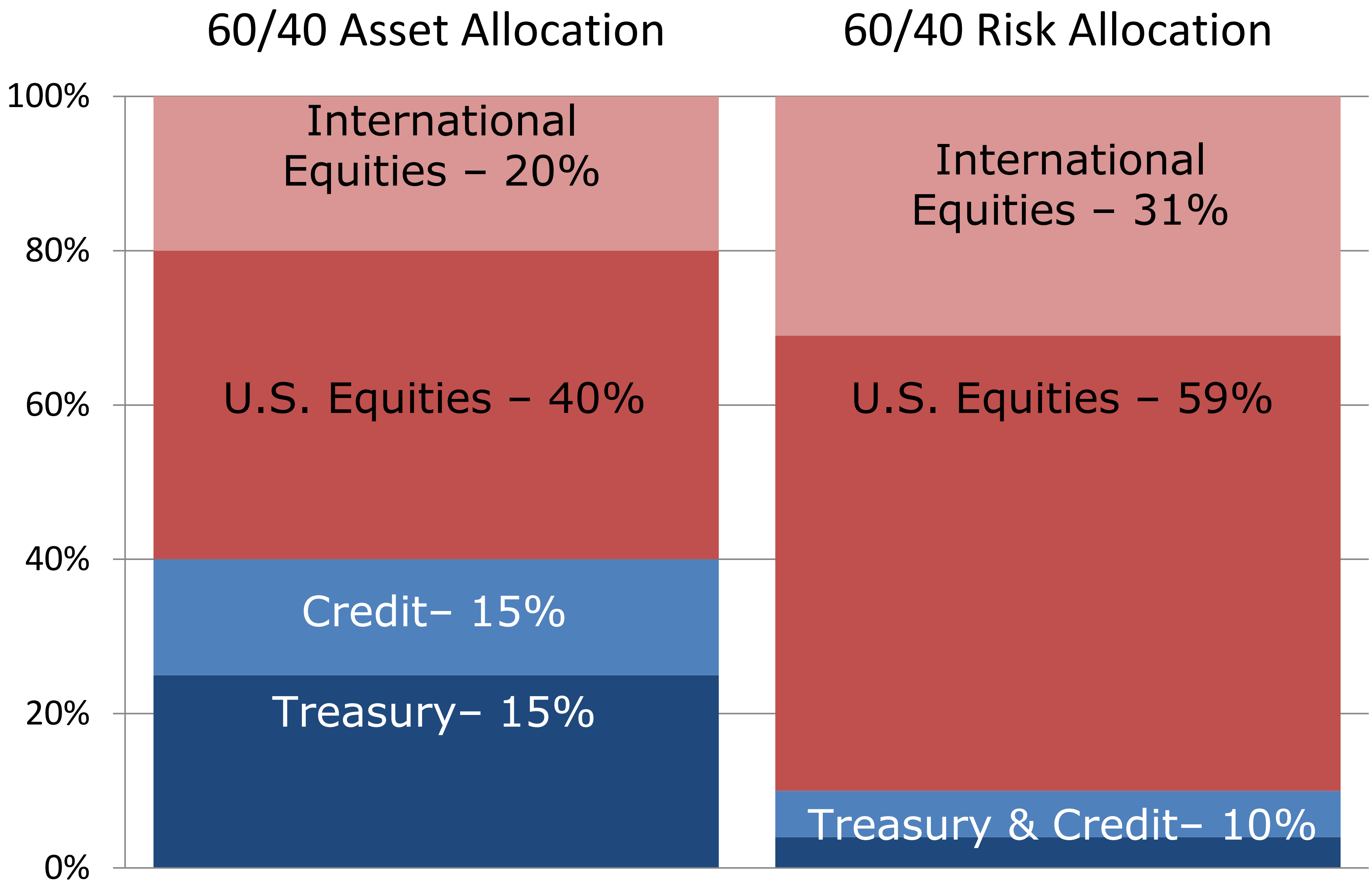
- **60/40 approach performs best in a rising growth, falling inflationary environment**
- **Defensive, risk-reducing asset classes squeezed out, leading to adverse results in other growth/inflation environments**
- **No exposure to assets sensitive to rising inflation**

Equity Markets vs. 60/40: Overwhelming Influence

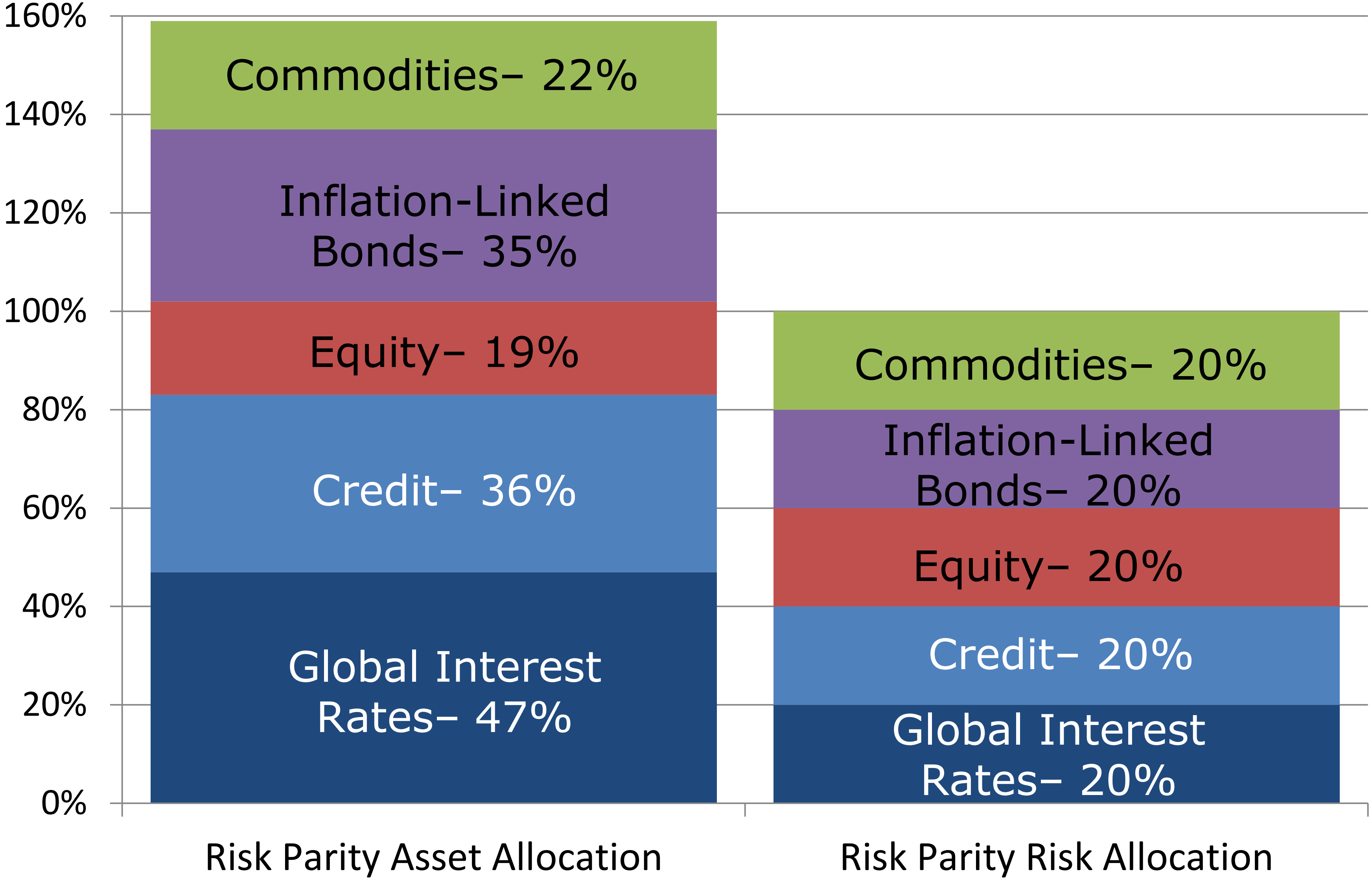


- **Correlation = .97; R-Squared = .94**
- **So, 94% of total fund volatility explained by equity markets**
- **Ergo, 94% of 60/40 portfolio risk may be attributable to equities**

Typical 60/40 Asset & Risk Allocation

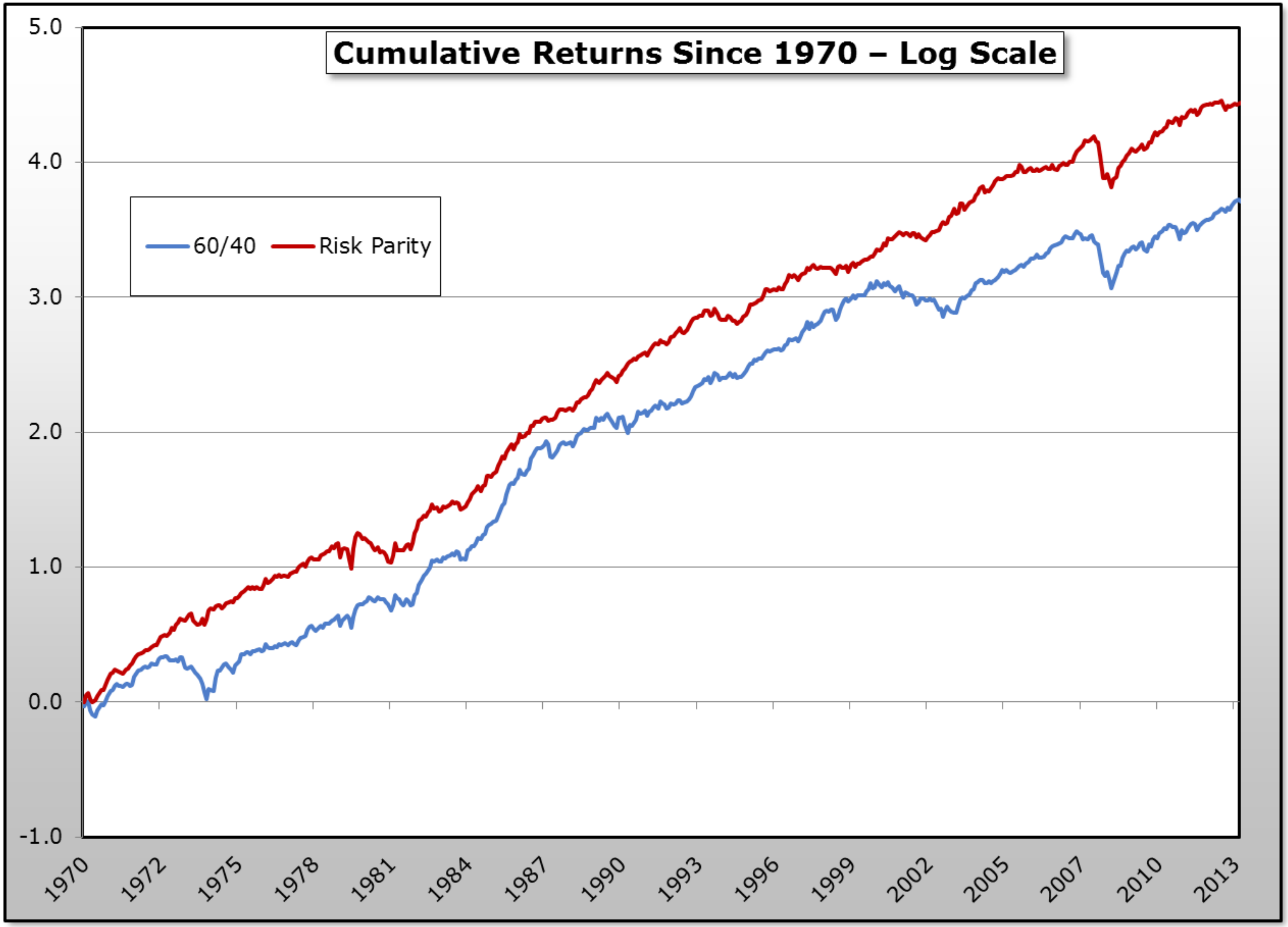


Sample Risk Parity Asset Allocation

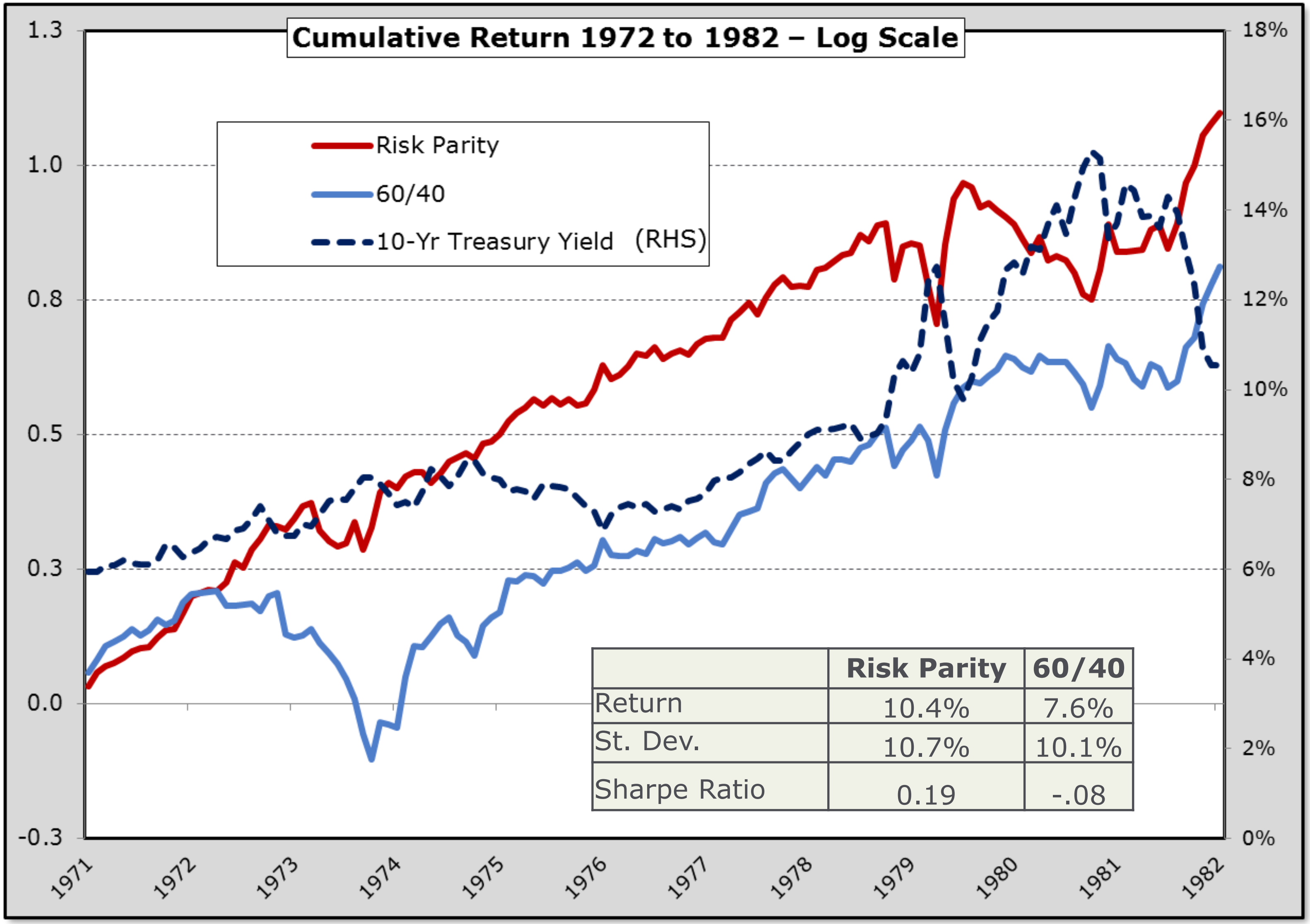


Risk Parity Performance

How has Risk Parity Performed?

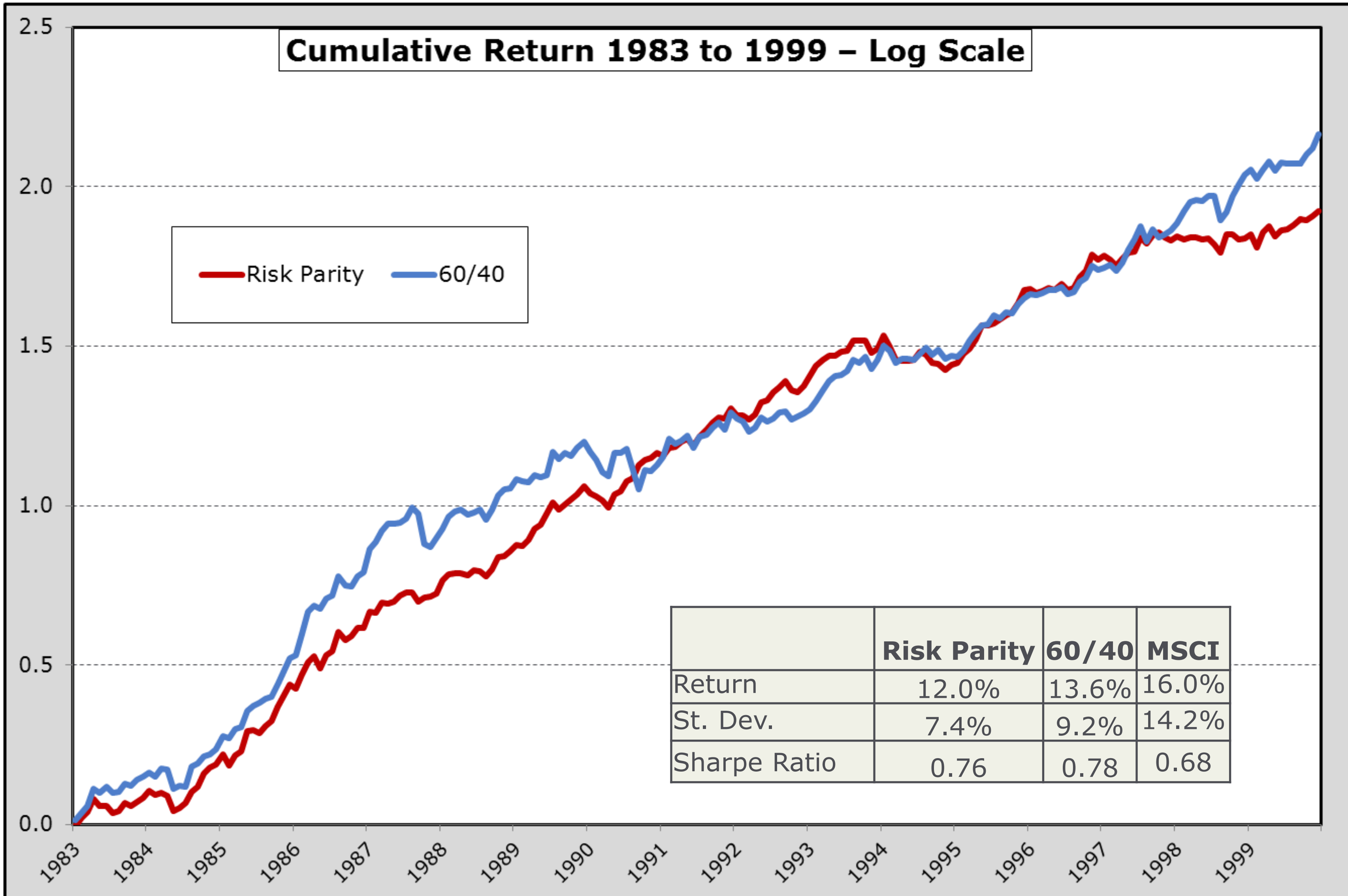


How has Risk Parity Performed?



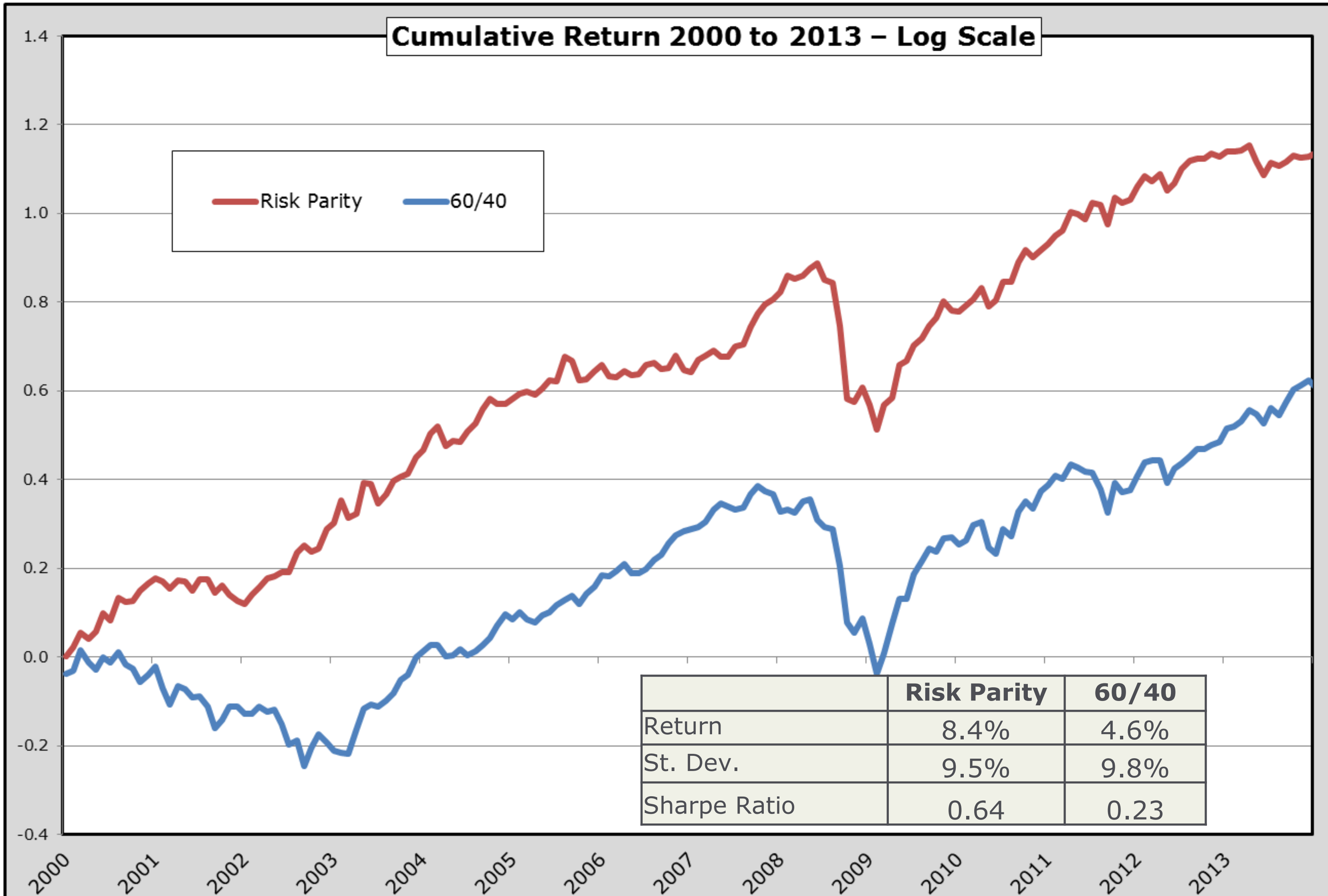
	Risk Parity	60/40
Return	10.4%	7.6%
St. Dev.	10.7%	10.1%
Sharpe Ratio	0.19	-.08

How has Risk Parity Performed?



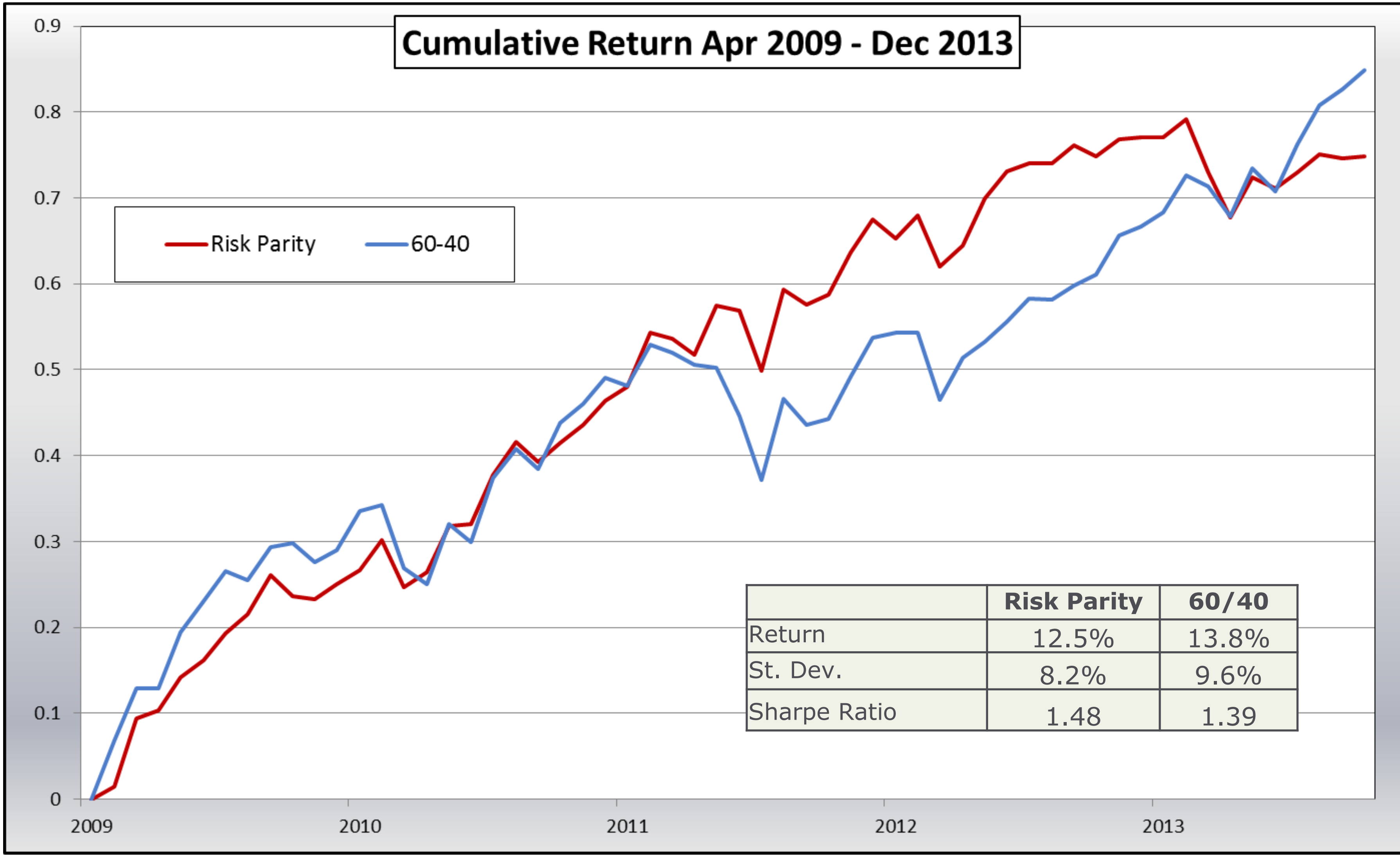
	Risk Parity	60/40	MSCI
Return	12.0%	13.6%	16.0%
St. Dev.	7.4%	9.2%	14.2%
Sharpe Ratio	0.76	0.78	0.68

How has Risk Parity Performed?



	Risk Parity	60/40
Return	8.4%	4.6%
St. Dev.	9.5%	9.8%
Sharpe Ratio	0.64	0.23

How has Risk Parity Performed?



	Risk Parity	60/40
Return	12.5%	13.8%
St. Dev.	8.2%	9.6%
Sharpe Ratio	1.48	1.39

Risk Parity Outlook

Risk Parity & Low Interest Rates

- **Questions to be asked of Risk Parity:**
  - What is the path of interest rate increases?
  - Interest rate increases in line with forward curve expectations?
  - Parallel shift higher for interest rate curve?

- **Are these the questions we should be asking of Risk Parity?**
  - Is Risk Parity dependent on a particular market regime for success?

- **A return to the original investment thesis may address concerns regarding Risk Parity and rising interest rates**

Risk Parity – Environmental Performance

- **Risk Parity performance in a rising rate environment?**
  - Different environments may produce different results

- **Strong Global Growth: 60/40 likely to outperform Risk Parity**
  - Growth sensitive assets likely to perform well
  - Return impact from rising interest rates depends on level of the increase and forward curve expectations
  - Lag mitigated by Risk Parity's exposure to growth sensitive assets

- **Rising Inflation: Risk Parity likely to outperform 60/40**
  - Likely a challenging environment for stocks and bonds
  - Risk Parity's exposure to inflation-linked bonds, commodities inflation sensitive assets and risk balance would be beneficial

- **Surprise Fed Funds Increase: Inflation + strong global growth**
  - Surprise increase in Fed Funds Rate increases attractiveness of cash and reduces attractiveness of other risk premium
  - A challenging environment for all portfolios including Risk Parity

Risk Parity Outlook

- **A core allocation providing balance for the portfolio**
- **Risk Parity's investment thesis remains intact**
- **Focus on interest rates ignores Risk Parity's overall benefits**
  - Reduces equity risk concentration
  - Sensitivity to inflationary market environments
  - Sensitivity to declining growth environments
- **An approach to efficiently take market risk-not a panacea**
- **Market pricing of rising rates offers cushion to nominal bond total return performance**
- **It is not just about bonds – Risk Parity's balance presents opportunity to perform well across diverse markets**