

Portfolio Risk & Return: A Word About Return Probability



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Objective

- We want to use market data to illustrate:
 - Investing is subject to sequence risk (enter and exit points) and historical data is subject to end-point bias.
 - Allocating more to equities may not always deliver on the “higher” return expectation.
 - Average return does not equate a high probability (degree of certainty) of achieving the desired outcome of higher return.
 - Portfolio risk management matters.

Data Set

- Some believe that moving from a classic¹ 60% Stock-40% Bond allocation to an 80% Stock-20% Bond allocation would produce a better outcome in long term (retirement) investing. This approach is often used to make up the years of under-saving and investments.
- We use the longest common period date range of the non-investable Russell 3000 Index and the Barclays Capital (Lehman Brother) US Aggregate Index as proxies for U.S. equities and high quality fixed income market respectively.
- Using monthly data provided by Morningstar for the period beginning on January 1, 1979, through October 30, 2013, we review the performance of a 60% Stock-40% Bond portfolio and an 80% Stock-20% Bond portfolio under the following measuring periods:
 - The “Common” period (i.e. the entire period)
 - The “Bull Market” period from January 1, 1979, through December 31, 1999
 - The “Bear Market” period from January 1, 2000, through October 31, 2013
- We examine the number of months taken to restore the original \$1,000 investment made on January 1, 2008. This gives an investor a good perspective regarding risk in the real world perspective.

¹ This is not an endorsement or a recommendation for the 60%-40% portfolio allocation. This “classic” allocation is often the default allocation and is used here for illustration purposes only.

Bull Market

80-20 Portfolio

Return/Risk

Asset Class	Arithmetic Mean	Standard Deviation
US Equity	17.37	15.18
US Bonds	9.45	6.68

Correlation

	US Equity	US Bonds
US Equity	1.00	0.31
US Bonds	0.31	1.00

Return Percentile

Projected Year	97th	50th	3rd
5	28.15	16.53	5.12
10	24.72	16.39	8.30
15	23.19	16.29	9.98
20	22.32	16.21	10.60
30	21.26	16.15	11.43

Target Return

Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	99.75	97.25	91.75	85.65
10	100.00	99.50	97.25	92.90
15	100.00	100.00	99.25	96.90
20	100.00	100.00	99.70	98.20
30	100.00	100.00	99.90	99.40

60-40 Portfolio

Return Percentile

Projected Year	97th	50th	3rd
5	24.43	15.02	5.65
10	21.55	14.91	8.17
15	20.31	14.76	9.59
20	19.66	14.71	10.08
30	18.74	14.67	10.85

Target Return

Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	99.95	97.95	91.25	84.35
10	100.00	99.70	97.15	90.80
15	100.00	100.00	99.35	95.80
20	100.00	100.00	99.75	97.30
30	100.00	100.00	100.00	99.00

Bear Market

80-20 Portfolio

Return/Risk

Asset Class	Arithmetic Mean	Standard Deviation
US Equity	5.17	16.12
US Bonds	5.74	3.57

Correlation

	US Equity	US Bonds
US Equity	1.00	-0.09
US Bonds	-0.09	1.00

Return Percentile

Projected Year	97th	50th	3rd
5	15.68	4.93	-5.41
10	12.34	4.76	-2.50
15	11.04	4.70	-0.96
20	10.25	4.63	-0.48
30	9.26	4.59	0.28

Target Return

Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	81.70	49.40	28.15	17.80
10	88.60	48.35	21.95	10.30
15	93.15	46.00	17.15	6.25
20	95.15	45.05	12.50	3.80
30	97.80	42.55	8.05	1.40

60-40 Portfolio

Return Percentile

Projected Year	97th	50th	3rd
5	13.37	5.27	-2.49
10	11.01	5.24	-0.38
15	9.91	5.13	0.76
20	9.33	5.10	1.24
30	8.55	5.07	1.87

Target Return

Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	89.35	52.75	25.35	12.90
10	96.20	52.30	18.25	5.80
15	98.85	52.25	14.15	2.60
20	99.25	51.75	9.40	1.55
30	99.85	51.50	5.80	0.35

Common Period

80-20 Portfolio

Return/Risk

Asset Class	Arithmetic Mean	Standard Deviation
US Equity	12.53	15.64
US Bonds	7.98	5.67

Correlation

	US Equity	US Bonds
US Equity	1.00	0.20
US Bonds	0.20	1.00

Return Percentile

Projected Year	97th	50th	3rd
5	23.07	11.76	0.75
10	19.68	11.61	3.78
15	18.26	11.50	5.41
20	17.36	11.43	5.98
30	16.34	11.38	6.79

Target Return

Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	97.70	86.95	73.90	61.15
10	99.75	93.95	80.10	64.75
15	100.00	97.70	85.60	66.60
20	100.00	98.65	86.95	67.55
30	100.00	99.60	91.25	71.05

60-40 Portfolio

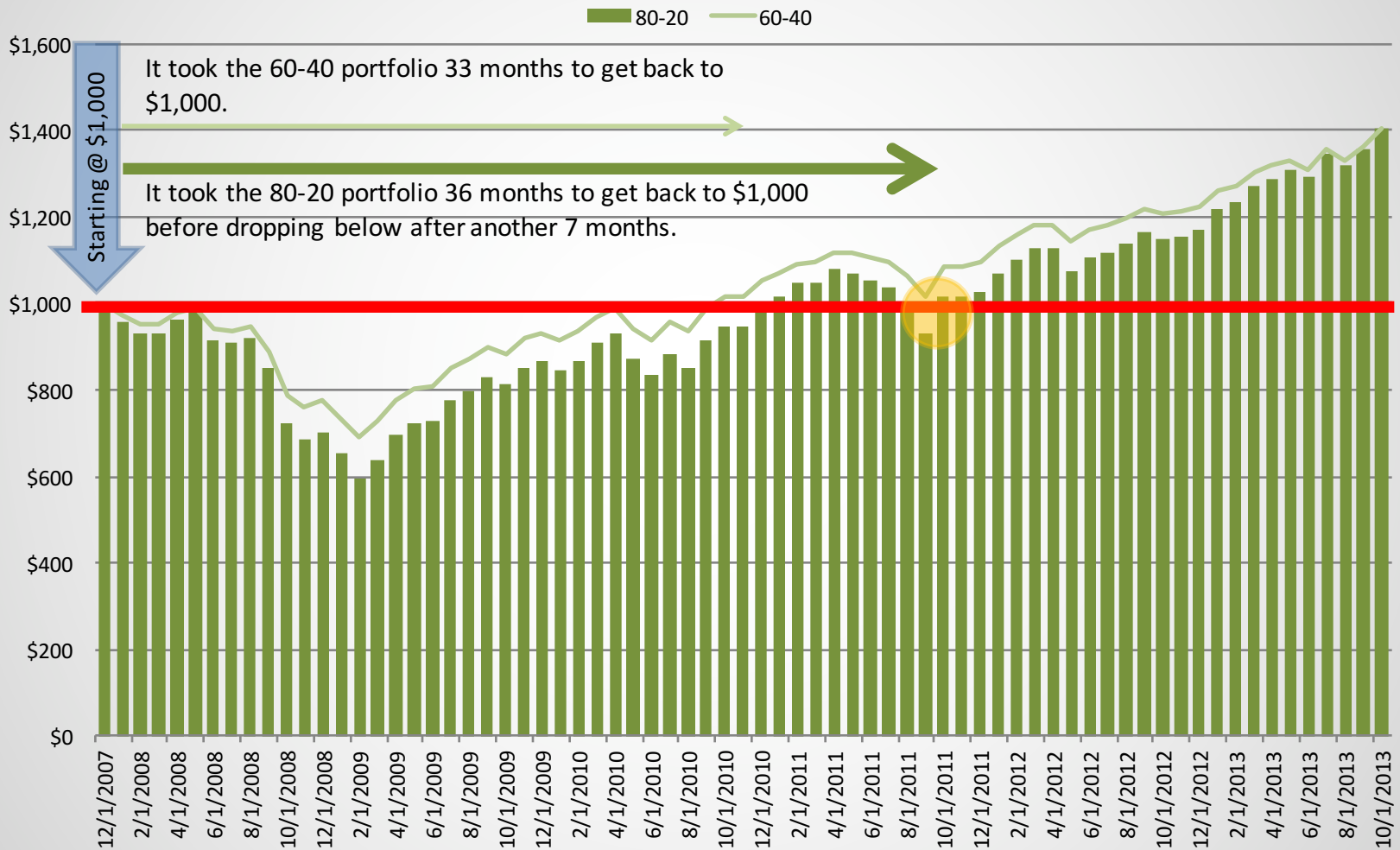
Return Percentile

Projected Year	97th	50th	3rd
5	19.99	11.07	2.22
10	17.22	10.94	4.54
15	16.08	10.82	5.95
20	15.49	10.78	6.39
30	14.60	10.75	7.15

Target Return

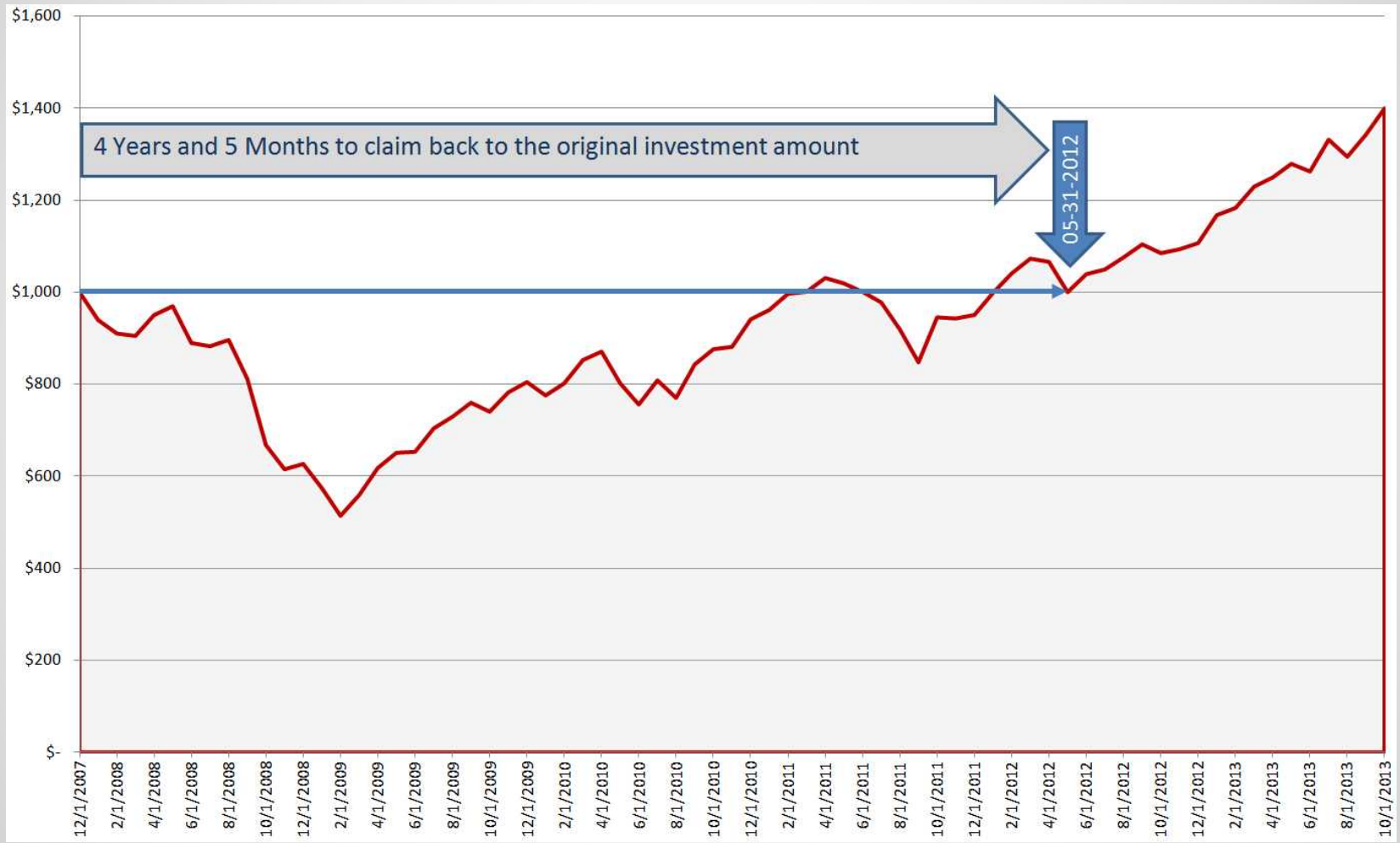
Projected Year	Target: 0%	Target: 5%	Target: 8%	Target: 10%
5	99.15	89.60	73.65	59.05
10	100.00	96.35	80.75	60.45
15	100.00	98.80	85.55	62.10
20	100.00	99.35	87.75	62.55
30	100.00	99.85	92.00	64.00

How Long Did It Take to Get My Money Back?



Source: Morningstar data from 12-31-2007 through 10-30-2013

Russell 3000 Index (12-31-2007 through 10-31-2014)



Source: Morningstar data from 12-31-2007 through 10-30-2013

Risk Asset Matters

- Every investor is subject to sequencing risk. People only control the starting and ending point of investing, and the rest is subject to chance. Thus the outcome of an investor with an investment start date (by coincidence) at the beginning of a 20 year bull market or at the beginning of a 13 year bear market is determined by chance and circumstance and the outcome is dramatically different while taking on similar market risk characteristics¹.
- Investing for retirement is not about getting the highest portfolio return during a lifetime. Rather it is to target a realistic and achievable average annual return (in meeting the investor's retirement asset or income objective) with the highest probability of success.
- Portfolio risk matters, and since 2000, the US stock market has twice experienced a 50% loss in value. An investor with a 60% Stock -40% Bond portfolio would need to wait 33 months before the portfolio returned to the starting value on 12-31-2007. With a more aggressive portfolio of 80% Stock and 20% Bond, an additional 3 months was needed to achieve the same parity. Further, after another 7 months, the 80-20 portfolio dipped again for two months below the 12-31-2007 starting value.
- The probability of achieving an 8% average annual return during the almost 34 years of data shows that the increase of 20% in equity allocation did not meaningfully increase the probability of success.
- The adage of "more risk more return" is only conditionally accurate. Risk and return does not have a linear relationship. To a certain point, the more risk assets are introduced, the higher the portfolio's return (a positive risk and return tradeoff). However, the condition of "diminishing return" sets in beyond that point where, for every unit of additional risk, a lesser unit of return is produced. Thus, more risk does provide more return up to a point, thereafter more risk is producing less return while contributing to a destabilizing environment. Therefore, "more risk does not always produce efficient or risk worthy return over time".
- Behavioral economics informs us that an investor's desire for gain is less than the fear of loss. Focusing portfolio construction and management on achieving the highest probability of a reasonable average annual return with emphasis on mitigating downside volatility (bumpiness) is prudent and better aligns with the emotion of an average investor.

¹ The standard deviation, a measurement of volatility, under the Bull market and Bear market periods are very similar even though the total return is significantly different among the two periods.

Disclosure

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- This document and all data thereof will not be updated going forward.