Asset Allocation Risk/Reward Spectrum: A 25-Year Review

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In this article several asset allocation models are reviewed over the past quarter century (from January 1, 2000 to December 31, 2024). The performance for each model is calculated under three different assumptions:

(1) accumulation mode lump sum investment of $10,000 (standard industry assumption)
(2) accumulation mode monthly investment of $250
(3) distribution mode when money is being withdrawn annually.

The first model is comprised of 100% cash (see Table 1). Cash produced a 25-year average annualized return of 1.78% in accumulation mode which assumes a single lump sum deposit at the start of the 25-year period. A $250 monthly investment for 25 years became $92,215. A monthly investment assumption rewards investments that have higher returns in the latter portion of the time period being measured—which was certainly not the case for cash. (Table 1 reports ***nominal*** returns that have not been adjusted for the impact of inflation or taxes).

The right-hand column in Table 1 also shows the ending account balance on December 31, 2024 of a retirement portfolio that sustained annual withdrawals for 25 years. The starting balance of the retirement portfolio was assumed to be $250,000 on January 1, 2000. The initial first year withdrawal was 5% of the starting balance which amounted to $12,500. The second-year withdrawal was 3% higher (based on a 3% COLA) which amounted to $12,875. A 3% COLA was applied annually over the 25-year period. The total 25-year withdrawal would be $455,742 **IF** the portfolio survived the entire 25-year period. Unfortunately, the 100% cash retirement portfolio was depleted in year 19, meaning that less than $313,000 was actually withdrawn by the time it was liquidated.

Next, an all-bond portfolio. The 25-year annualized return of a 100% bond portfolio was 3.94% which turned a $10,000 investment into $26,255. Monthly $250 investments grew to $106,474. The ending balance in a 100% bond retirement portfolio after 25 annual withdrawals was $61,538—which indicates it survived the entire 25-year period while allowing the retiree to withdraw a total of $455,742 and still had $61,538 remaining at the end of the 25th year.

The next asset allocation model is a 60% large cap US stock/40% US bond portfolio, which is often referred to as a "balanced portfolio". The 60/40 portfolio produced a 25-year annualized return of 6.64% from 2000-2024. The 60/40 portfolio was rebalanced annually. Investing $250 per month became $230,495. The ending account balance of a 60/40 retirement portfolio (after 25 annual withdrawals) was a meager $4,413. Not a typo. More on this later.

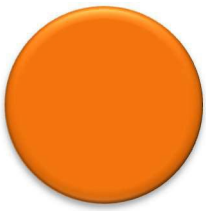
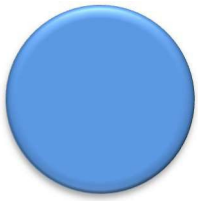
Next, we examine a multi-asset portfolio that included 12 different indexes (i.e., asset classes) in equal portions (8.33% each) and was rebalanced annually. The 12 indexes used in this analysis are shown at the end of this article. The 12-asset portfolio produced a 25-year average annualized nominal return of 6.58% assuming a lump sum investment. Monthly investments of $250 grew to $173,310. The ending balance in a retirement portfolio that sustained 25 annual withdrawals was $298,446—more than the starting balance of $250,000!

Finally, we consider a 100% stock portfolio. As with the 100% cash model, this does not represent an asset allocation model because it only includes one asset class. Large cap US stock (S&P 500 Index) produced an impressive 25-year average annualized return of 7.70% from 2000-2024 in "accumulation" mode. Monthly investments of $250 became $370,028--the benefit of strong returns in the latter years of the 25-year period. However, the ending balance in an all-stock retirement portfolio when money was being annually withdrawn was $0. In fact, it ran out of money in year 17 meaning that less than $270,000 was actually withdrawn before it failed.

In this 25-year period, large cap US stock was the best performer in both "accumulation modes" (lump sum and monthly investing) but the worst performer in "distribution mode". This is a stark reminder that a lump sum assumption (which is what all published performance figures are based on) may be irrelevant when considering how a particular fund or asset allocation model will hold up when money is being withdrawn. Detailed analysis of each portfolio's year-to-year experience in "distribution mode" is provided in Table 2.

Table 1. 25-Year Asset Allocation Risk Spectrum: 2000-2024

(Performance figures not adjusted for inflation)

Risk Level	Various Asset Allocation Models with Annual Rebalancing (Using underlying indexes)		25-Year Annualized Return (%) of Lump Sum Investment	25-Year Growth of $10,000 Lump Sum Investment*	25-Year Growth of $250 Monthly Investment	Retirement Account Ending Balance**
Very Conservative	100% Cash 90-day T Bill		1.78%	$15,562	$92,215	$0 Ran out in year 19
Conservative	100% Bonds Aggregate Bond Index		3.94%	$26,255	$106,474	$61,538
Moderately Aggressive	60% US Stock 40% Bonds 60% S&P 500 40% Agg Bond Index		6.64%	$49,943	$230,495	$4,413
Moderately Aggressive	Index-based *7Twelve* Portfolio 8.33% allocation to 12 asset classes		6.58%	$49,240	$173,310	$298,446
Very Aggressive	100% Large Cap US Stock S&P 500		7.70%	$63,876	$370,028	$0 Ran out in year 17

* Ending account balance on December 31, 2024 assuming a lump sum investment of $10,000 on January 1, 2000 (25-year period)

** Ending account balance on 12/31/2024 in a retirement portfolio with a starting balance of $250,000 on January 1, 2000, 5% initial withdraw rate, 3% cost of living increase in the annual cash withdrawal. A total of 25 annual withdrawals totaling $455,742. Detailed year-to-year account balances in Table 2.

Retirement is a Time to Be Diversified

The analysis of retirement portfolio survival in this article used an initial withdrawal rate of 5%. This particular rate was used for illustrative purposes and is not a suggested or recommended initial withdrawal rate for any particular retiree. An appropriate withdrawal rate is determined individually after considering a number of factors, including the amount of money in the retirement account, age of the person, needed income each year, anticipated number of years withdrawals may take place, anticipated annual rate of return of portfolio, anticipated general inflation rate in the overall economy, COLA being imposed, etc.).

Portfolio diversification should be a lifelong strategy before retirement as well as during retirement. Broad diversification tends to smooth out portfolio performance which is crucially important when money is being withdrawn from a portfolio—such as in retirement.

Why is smoothing portfolio performance so crucial? Because the sequence-of-returns matters a great deal when money is being withdrawn from a portfolio. The scenario a retiree wants to avoid is one in which their portfolio suffers several annual losses on the "front-end" (or just as they start pulling money out at the start of retirement). A disastrous sequence-of-returns has the potential to materially reduce the longevity of a retirement portfolio. This is illustrated in Table 3. Large cap stock and the 60/40 portfolio were hammered with losses in the first 3 years of the withdrawal period. This spelled doom for the all-stock and the 60/40 portfolio during this particular 25-year period. In fairness, had the analysis period started in 2003 the all-stock and 60/40 portfolio would have fared much better in distribution mode.

The broad diversification achieved by the 12-asset portfolio did not eliminate sequence-of-returns risk, but it significantly reduced the size of the losses in the 2nd and 3rd year. In addition to ***sequence-of-returns*** risk there is ***size-of-returns*** risk. Portfolio returns that are simply too small (such as a 100% cash portfolio) can also kill a retirement portfolio as demonstrated over the past 25 years.

Diversified Asset Allocation is Not Expensive

Building a broadly diversified, multi-asset portfolio need **not** be expensive. To illustrate this, I've listed below the aggregate expense ratio of a 12-asset class investment model known as the ***7Twelve*** Portfolio. I am the designer of the 7Twelve Portfolio.

If using actively managed mutual funds from various fund families, the 2025 Active 7Twelve portfolio costs 58 bps. If using only Vanguard ETFs, the 2025 7Twelve Vanguard ETF portfolio costs only 13 bps. Performance for each of the 7Twelve models over the past 25 years in accumulation AND distribution modes is illustrated.

12-Asset *7Twelve* model (January 1, 2000 – December 31, 2024	***Active model*** *using 12 actively managed mutual funds*	***Passive model*** *using 12 ETFs from various fund families*	*Using 12 Vanguard Mutual Funds*	*Using 12 Vanguard ETFs*	*Using 12 Fidelity* Mutual funds	*Using 12 Funds available at Schwab*
Portfolio Aggregate Annual Expense Ratio in January 2025	**58 bps**	**27 bps**	**25 bps**	**13 bps**	**32 bps**	**17 bps**
25-Year Lump Sum Performance from 2000-2024	**6.72%**	**5.98%**	**6.50%**	**6.39%**	**7.13%**	**6.15%**
25-Year Growth of $250 Monthly Investment (2000-2024)	**$150,957**	**$152,746**	**$163,957**	**$167,362**	**$184,946**	**$159,850**
25-Year $250,000 Retirement Portfolio Ending Balance (2000-2024)	**$424,969**	**$242,599**	**$331,226**	**$293,079**	**$418,828**	**$257,908**

Table 2. 25-Year Retirement Portfolio Survival: 2000-2024

$250,000 starting balance on January 1, 2000
5% initial withdrawal and 3% annual COLA
Total 25-year withdrawal of $455,742 IF the portfolio survived 25 years

Retirement Portfolio Asset Allocation Model (Using underlying indexes shown on next page)		**1-Asset Portfolio** **Very Conservative**	**2-Asset Portfolio*** **Conservative**	**2-Asset Portfolio*** **Moderately Aggressive**	**12-Asset Portfolio*** **Moderately Aggressive**	**1-Asset Portfolio** **Very Aggressive**
		100% Cash	**100% Bonds**	**60% US Stock 40% Bonds**	***Index-based 7Twelve Portfolio*** **(8.33% each index)**	**100% Large US Stock** **(S&P 500)**
Calendar Year	**Annual Cash Withdrawal** **(3% annual COLA increase)**					
Year-End Account Balances **Shaded area in yellow indicates portfolio value is "underwater" (less than starting balance of $250,000)**						
2000	**12,500**	252,041	266,565	235,469	251,050	214,739
2001	**12,875**	247,692	276,197	213,755	232,927	176,340
2002	**13,261**	238,400	291,260	180,917	218,357	124,107
2003	**13,659**	227,151	289,556	201,365	263,866	146,048
2004	**14,069**	216,195	288,050	203,939	297,179	147,872
2005	**14,491**	208,504	280,554	197,439	319,793	140,644
2006	**14,926**	203,434	277,787	204,647	353,672	147,932
2007	**15,373**	196,912	281,766	201,722	381,868	140,686
2008	**15,835**	183,760	280,697	145,336	268,700	72,801
2009	**16,310**	167,726	281,035	155,552	321,295	75,757
2010	**16,799**	151,156	282,620	156,882	350,803	70,370
2011	**17,303**	133,933	287,481	146,488	330,803	54,553
2012	**17,822**	116,226	281,776	145,201	348,611	45,461
2013	**18,357**	97,937	257,717	153,886	366,731	41,829
2014	**18,907**	79,061	254,184	151,290	353,304	28,647
2015	**19,475**	59,628	236,107	133,404	312,427	9,569
2016	**20,059**	39,759	222,299	124,331	328,319	**0**
2017	**20,661**	19,468	209,512	121,718	347,029	**0**
2018	**21,280**	**0**	188,255	97,241	299,600	**0**
2019	**21,919**	**0**	182,746	97,084	327,336	**0**
2020	**22,576**	**0**	173,888	88,140	322,005	**0**
2021	**23,254**	**0**	147,952	79,523	353,000	**0**
2022	**23,951**	**0**	104,752	42,792	301,839	**0**
2023	**24,670**	**0**	85,874	25,818	305,106	**0**
2024	**25,410**	**0**	61,538	4,413	298,446	**0**
Account Value After 25 Years of Withdrawals		**$0**	**$61,538**	**$4,413**	**$298,446**	**$0**

Table 3. Sequence of Returns for Each Portfolio over the Past 25 Years (negative annual returns highlighted in red)

25 Calendar Year Returns	100% Cash	100% Bonds	60% S&P 500 40% Bonds	12-Index Portfolio	100% S&P 500
2000	5.82%	11.63%	-0.81%	5.42%	-9.10%
2001	3.38%	8.44%	-3.75%	-2.09%	-11.89%
2002	1.60%	10.25%	-9.16%	-0.56%	-22.10%
2003	1.01%	4.10%	18.85%	27.10%	28.68%
2004	1.37%	4.34%	8.26%	17.96%	10.88%
2005	3.15%	2.43%	3.92%	12.49%	4.91%
2006	4.73%	4.33%	11.21%	15.26%	15.79%
2007	4.35%	6.97%	6.08%	12.32%	5.49%
2008	1.36%	5.24%	-20.10%	-25.49%	-37.00%
2009	0.15%	5.93%	18.25%	25.64%	26.46%
2010	0.14%	6.54%	11.65%	14.41%	15.06%
2011	0.05%	7.84%	4.40%	-0.77%	2.11%
2012	0.09%	4.21%	11.29%	10.77%	16.00%
2013	0.06%	-2.02%	18.62%	10.46%	32.39%
2014	0.03%	5.97%	10.60%	1.49%	13.69%
2015	0.05%	0.55%	1.05%	-6.06%	1.38%
2016	0.32%	2.65%	8.23%	11.51%	11.96%
2017	0.93%	3.54%	14.52%	11.99%	21.83%
2018	1.94%	0.01%	-2.63%	-7.54%	-4.38%
2019	2.06%	8.72%	22.38%	16.57%	31.49%
2020	0.36%	7.51%	14.04%	5.27%	18.40%
2021	0.04%	-1.54%	16.61%	16.85%	28.71%
2022	2.01%	-13.01%	-16.07%	-7.71%	-18.11%
2023	5.07%	5.53%	17.98%	9.26%	26.29%
2024	4.97%	1.25%	15.51%	6.15%	25.02%

Indexes used in performance calculations for all portfolios in this analysis including 12-asset portfolio.

Large US Stock	S&P 500 Index TR
Mid Cap US Stock	S&P Midcap 400 Index TR
Small Cap US Stock	S&P SmallCap 600 Index TR
Non-US Developed Stock	MSCI EAFE Index NR
Non-US Emerging Stock	MSCI EM Index GR
Real Estate	S&P Global REIT Index TR
Natural Resources	S&P North American Natural Resources Index TR
Commodities	DBIQ Optimum Yield Diversified Commodity Index TR
US Bonds	Bloomberg US Aggregate Bond Index TR
Inflation Protected Bonds	Bloomberg US Treasury US TIPS Index TR
Non-US Bonds	Bloomberg Global Treasury Index TR
Cash	US Treasury Bill 90 Day TR