

Asset Allocation: A Review of the Past 51 Years

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In this review we will examine several asset allocation models and how they performed over the past 51 years (from January 1, 1970 to December 31, 2020) both in accumulation mode (pre-retirement) and distribution mode (during retirement).

The first model is 100% cash (see Table 1 on next page). As cash is only one asset class it does not represent an asset allocation model (which implies at least two asset classes). However, as many investors often hide out in cash when they are afraid of the equities markets or worried about bonds, it's worth examining the performance of cash over the past half century. As can be seen, cash produced a return of 0.36% in calendar year 2020. The 51-year average annualized return of a 100% cash investment was 4.66% (accumulation mode performance) with a standard deviation of annual returns of 3.53%. It's important to recognize that Table 1 is showing *nominal* returns that have not been adjusted for the impact of inflation (as measured by the Consumer Price Index).

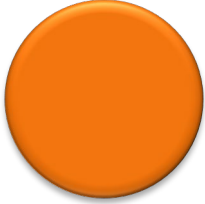



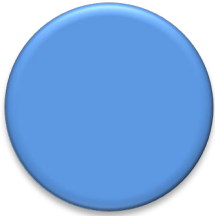
The last column in Table 1 shows the median ending account balance of a retirement portfolio. For an all-cash portfolio, the median ending account balance was \$125,726 (distribution mode performance). The median ending account balance was calculated over 27 rolling 25-year periods between 1970 and 2020, where the starting balance was assumed to be \$250,000. The initial withdrawal was 5% of the starting balance multiplied by a 3% cost of living increase—equally a first-year withdrawal of \$12,875. The 2nd year withdrawal was 3% higher, or \$13,261, and so on. The total withdrawal in each 25-year rolling period equaled \$469,413. (See Table 2 for the results of each 25-year period). It should be noted that the all-cash retirement portfolio had a 33% failure rate (see Table 2). That is, it failed to survive for the full 25 years during “distribution mode” in 33% of the rolling 25-year periods.

We now move down the asset allocation food chain to a 50% cash/50% bond portfolio. This 50/50 portfolio represents actual asset allocation (that is, a model that uses more than one asset class)—albeit a very conservative model. The return of a 50% cash/50% bond portfolio in 2020 was 3.93%. The 51-year annualized return of a 50/50 portfolio was 6.07% and the median ending account balance after 25 years of withdrawals in a retirement portfolio was \$409,163. This 50/50 bond/cash portfolio failed to survive for 25 years in distribution mode on two occasions (1994-2018 and 1996-2020).

The next asset allocation model is a 60% large cap US stock, 40% US bond portfolio that is typically referred to as a “balanced fund”. The 60/40 portfolio gained 14.04% in 2020, whereas the 51-year annualized performance was an impressive 9.75%. The 51-year standard deviation of annual returns was 10.98%. When any type of equity ingredient is added to a fixed income portfolio the standard deviation will increase—often substantially. The 60/40 portfolio was rebalanced annually, as was the 50% cash/50% bond portfolio. The median ending account balance in a retirement portfolio that was sustaining annual withdrawals was \$1.228 million. This outcome is quite remarkable in light of the fact that the retirement portfolio began each 25-year period with a starting balance of \$250,000. However, as shown in Table 2, there was a high degree of variability in the ending account balance over the rolling 25-year distribution periods.

Next, we examine a multi-asset portfolio that included seven different asset classes in equal portions (14.29% each) that was rebalanced annually. The asset classes included large US stock, small cap US stock, non-US developed stock, real estate, commodities, US bonds, and cash. The indexes utilized to represent these asset classes are shown on the last page.

Table 1. 51-Year Asset Allocation Risk & Return Spectrum: 1970-2020
(Performance figures not adjusted for inflation)

Risk Level	Various Asset Allocation Models		% Return in 2020	51-Year Annualized Gross Return (%)	51-Year Standard Deviation of Return (%)	Median Ending Account Balance in \$250,000 Retirement Portfolio*
Very Conservative	100% Cash		0.36	4.66	3.53	125,726
Conservative	50% Cash 50% Bonds		3.93	6.07	4.18	409,163
Moderately Aggressive	60% US Stock 40% Bonds Traditional "Balanced" Fund		14.04	9.75	10.98	1,228,935
Moderately Aggressive	14.3% in 7 different asset classes 7-Asset Diversified Portfolio** 70% Growth/ 30% Fixed Income		2.73	9.51	10.15	1,748,463
Very Aggressive	100% US Stock		18.40	10.75	16.89	1,480,678

* Median ending account balance over 27 rolling 25-year periods. Assuming a starting balance of \$250,000, 5% initial withdraw rate, 3% cost of living increase in the annual cash withdrawal. Total withdrawal in each of the 27 rolling 25-year periods equaled \$469,413. See Table 2 for in-depth analysis.

** 7-asset portfolio consisted of large cap US stock, small cap US stock, non-US stock, real estate, commodities, US bonds, and cash.

Raw data source: Steele Systems Mutual Fund Software, calculations by Craig L. Israelsen.

Past performance does not guarantee future performance. The multi-asset portfolios were rebalanced at the start of each year.

The 7-asset portfolio gained 2.73% in 2020. Its 51-year average annualized nominal return was 9.51% with a standard deviation of annual returns of 10.15%—comparable performance with less volatility than the standard 60/40 asset allocation model. The median ending balance over 27 rolling 25-year withdrawal periods was \$1.748 million—more than \$519,000 larger than the classic 60/40 model.

Finally, we examine a 100% stock model. As with the 100% cash model, this does not represent an asset allocation model because it only includes one asset class. But, as large cap US stock is a very prominent asset class, it is reviewed here. Large cap US stock (S&P 500 Index) gained 18.40% in 2020 with a 51-year average annualized return of 10.75%. The standard deviation was 16.89% and the median ending retirement account balance was just under \$1.5 million—roughly \$267,000 below the 7-asset portfolio.

Retirement is a Time to Stay 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 your retirement account, your age, 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—both before retirement as well as during retirement. Warning: diversification is not exciting. That’s by design. Broad diversification tends to smooth out returns which is crucially important when you start withdrawing money from a portfolio—such as in retirement. Why is it 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 just as they start pulling money out at the start of retirement. This would be a potentially disastrous sequence-of-returns risk which could materially reduce the longevity of their retirement portfolio. Broad diversification does not eliminate sequence-of-returns risk, but it does significantly reduce it. And, for that reason, diversification should be a central tenet in a retiree’s investment philosophy.

Diversified Asset Allocation is Not Expensive

Building a multi-asset portfolio need not be expensive. To illustrate this I’ve reported the aggregate expense ratio of a 12-asset class model known as the 7Twelve® Portfolio in the table below (disclosure: I am the designer of the 7Twelve® Portfolio). If using actively managed mutual funds from various fund families, the 7Twelve portfolio can be built for 76 bps. If using only Vanguard ETFs, the 12-asset class 7Twelve portfolio aggregate cost can be as low as 10 bps. For more information about the various 7Twelve model portfolios: <http://www.7twelveportfolio.com/Downloads/Web7TwelveReport.pdf>






12-Asset <i>7Twelve</i> ® model	<i>Using 12 Actively Managed Mutual Funds</i>	<i>Using 12 ETFs from various fund families</i>	<i>Using 12 Vanguard Mutual Funds</i>	<i>Using 12 Vanguard ETFs</i>	<i>Using 12 Fidelity Mutual funds</i>	<i>Using 12 ETFs available at Schwab</i>
Portfolio Aggregate Annual Expense Ratio in January 2021	76 bps	25 bps	18 bps	10 bps	32 bps	13 bps

Table 2. Retirement Portfolio Survival Analysis: 27 Rolling 25-Year Periods from 1970-2020

\$250,000 starting balance in each 25-Year Period

5% initial end-of-year withdrawal with 3% annual COLA

(Annual cost-of-living-adjustment applied at the end of each year starting with year 1)

Retirement Portfolio Asset Allocation Models		1-Asset Portfolio	2-Asset Portfolio	2-Asset Portfolio	7-Asset Portfolio	1-Asset Portfolio
		Very Conservative	Conservative	Moderately Aggressive	Moderately Aggressive	Very Aggressive
		100% Cash	Cash and Bonds (50% in each)	US Stock and Bonds (60% US Stock, 40% Bonds)	Diversified 7-Asset Portfolio* with Equal Allocations (14.3% each)	100% Large US Stock
Rolling 25-Year Periods Starting Account Balance \$250,000 5% initial withdrawal rate 3% annual cost of living adjustment <i>(Total withdrawal of \$469,413 in each 25-Year Period)</i>						
Starting Year	Ending Year	Ending Account Balance After 25 Years				
1970	1994	325,898	536,292	1,030,945	2,164,627	988,572
1971	1995	329,656	493,534	1,240,563	2,661,550	1,477,488
1972	1996	361,892	501,664	1,219,052	2,626,526	1,450,003
1973	1997	399,284	559,838	1,228,935	2,383,070	1,282,861
1974	1998	392,618	594,389	2,192,086	2,622,906	3,379,444
1975	1999	373,656	583,850	3,820,786	3,710,749	8,446,670
1976	2000	387,667	612,899	2,736,196	3,307,189	4,923,284
1977	2001	402,615	566,905	2,004,667	2,509,824	3,219,388
1978	2002	405,619	624,392	2,186,646	2,263,825	3,195,251
1979	2003	380,200	658,601	2,661,431	2,400,512	4,063,831
1980	2004	322,322	662,932	2,606,287	2,097,479	3,741,955
1981	2005	258,018	647,802	2,136,488	1,748,463	2,666,776
1982	2006	174,482	595,345	2,641,535	2,137,773	3,703,071
1983	2007	125,726	409,163	2,064,762	1,864,668	3,116,226
1984	2008	91,270	378,136	1,364,754	1,039,723	1,520,430
1985	2009	49,913	303,319	1,497,154	1,184,436	1,896,346
1986	2010	25,195	210,217	1,148,953	958,011	1,480,678
1987	2011	11,004	161,858	953,467	708,681	1,207,014
1988	2012	\$0 in year 24	169,337	1,088,074	757,536	1,404,556
1989	2013	\$0 in year 24	143,139	1,114,552	628,027	1,542,880
1990	2014	\$0 in year 23	90,928	836,478	460,621	1,109,268
1991	2015	\$0 in year 22	60,911	922,449	570,738	1,349,646
1992	2016	\$0 in year 21	16,369	657,480	435,724	957,698
1993	2017	\$0 in year 21	7,476	716,183	467,938	1,119,634
1994	2018	\$0 in year 21	\$0 in year 24	621,604	364,895	972,143
1995	2019	\$0 in year 21	13,164	883,061	473,013	1,403,559
1996	2020	\$0 in year 20	\$0 in year 23	568,718	316,129	887,474
Median Ending Account Balance		125,726	409,163	1,228,935	1,748,463	1,480,678

Past performance does not guarantee future performance

The multi-asset portfolios were rebalanced at the start of each year.

* 7-asset portfolio consisted of large cap US stock, small cap US stock, non-US stock, real estate, commodities, US bonds, and cash.

Raw data source: Steele Systems Mutual Fund Software, calculations by Craig L. Israelsen

Indexes used in calculation of 51-year performance (1970-2020)

Portfolio Asset Class	Index Used to Represent Asset Class
Large US Stock	S&P 500 TR Index 1970-2020
Small Cap US Stock	Ibbotson Small Stock Index 1970-1978 Russell 2000 TR Index 1979-2020
Non-US Developed Stock	MSCI EAFE NR Index 1970-2020
Real Estate	Chan, Erickson, and Wang (Real Estate Investment Trusts: Structure, Performance, and Investment Opportunities”, Table 2.2) 1970-1971 NAREIT Equity REIT Index 1972-1977 Dow Jones US Select REIT TR Index 1978-2020
Commodities	S&P Goldman Sachs Commodity TR Index 1970-2020
US Bonds	Ibbotson Intermediate-term Government Bond Index 1970-1975 Barclays Capital US Aggregate Bond TR Index 1976-2020
Cash	US TREASURY Stat US T-Bill 90 Day TR 1970-2020