Keeping a Retirement Portfolio Intact for 25 Years

Dec 10, 2020 / By Craig L. Israelsen, PhD

| My Notes | Feb 1, 2021 |

Most people saving for retirement have wondered whether they will outlive their money. How they withdraw from accounts will strongly affect their answer. This analysis looks at the impact of three common withdrawal styles on the survival of the same portfolio for 25 years.

It's highly likely that every retiree (or soon-to-be retiree) has pondered the question "Will we run out of money before we die?" Of course, that depends on a whole host of variables, not the least of which is the retiree's spending habits. Clearly, another key variable is the method of withdrawing money.

The analysis in this article drills down on three common ways that money can be withdrawn from a portfolio during retirement and how that impacts portfolio survival over a 25-year period.

A four-asset retirement portfolio with a starting balance of $500,000 was modeled over a total of 70 rolling 25-year periods from 1926–2019. The four equally weighted assets in the portfolio were large-cap U.S. stock, small-cap U.S. stock, U.S. bonds and cash. Annually rebalancing was assumed. An annual expense ratio of 100 bps was applied, which effectively reduced the index-based returns downward to reflect actual costs of investing in "real life."

Table 1. The first method of withdrawal is not a choice, but rather a command. It is the required minimum distribution, or RMD. The current RMD divisors found in the Uniform Lifetime Table were used beginning at age 72. The results of each rolling 25-year period are provided in Table 1.

Table 2. The second option was a fixed-dollar withdrawal amount in the first year, followed by a cost-of-living (COLA) increase in subsequent years. Specifically, in this analysis I used a four percent initial withdrawal rate, which set the first-year withdrawal at $20,000 (assuming a starting portfolio balance of $500,000). The withdrawal in the second year was $20,000 × 1.03 = $20,600 (using a COLA of three percent). In the third year, it was $20,600 × 1.03 = $21,218, and so on. This approach sets in motion a pattern that allows a retiree to know in advance what each years' withdrawal will be. In this analysis using the assumptions of a $500,00 starting balance, a four percent initial withdrawal rate, and a three percent COLA, the total withdrawal over each of the 70 25-year periods was $729,185—for an average of $29,167 each year. The results are outlined in Table 2.

Table 3. The third withdrawal option involved withdrawing money based on a specific percentage of the portfolio value at the end of each year. In this analysis, I used a withdrawal rate of four percent each year. Inasmuch as the portfolio value fluctuated over time (and over the various rolling 25-year periods based on the varying sequence-of-returns) the amount withdrawn each year also fluctuated up and down. These portfolio results are found in Table 3.

One of the criticisms of this approach is that the annual withdrawal can decline year-over-year based on the fluctuations in the portfolio's value. That is true. The question is how often and by how much? The answer is 35% of the time and by

an average of $805 (using the assumptions in this analysis). In other words—not a big deal.

Good news

The summary table shown just below provides an overview of the results.

Good News: Results From 70 Rolling 25-Year Periods 1926–2019 Starting Balance of $500,000	Table 1: RMD withdrawals	Table 2: Fixed-dollar first withdrawal followed by annual 3% COLA	Table 3: 4% withdrawal each year
Average balance after 5 years	$622,588	$632,426	$628,579
Percent of time portfolio balance **lower** than starting balance after 5 years	17.1%	17.1%	14.3%
Average balance after 25 years	$714,686	$1,820,316	$1,508,174
Percent of time portfolio balance **lower** than starting balance after 25 years	27.1%	7.1%	0%
Percent of time portfolio ending balance after 25 years **higher** than balance after 5 years (The *"stay with it"* measure)	60%	94.3%	100%
Average 25-year **total dollar withdrawal**	$1,326,295	$729,185	$906,753
Percent of time portfolio **failed** within 25 years	0%	1.43%	0%
Percent of time the annual withdrawal declined in the following year during each 25-year period	0%	0%	35% Average decline was $805

Source: Craig Israelsen, PhD

The first piece of good news is that in each of the three withdrawal systems, the average portfolio balance after five years of withdrawals was higher than the starting balance. More specifically, the account balance five years after starting withdrawals was lower than the starting balance only 17.1% of the time for RMD and COLA-based withdrawals. If withdrawing four percent of the portfolio balance each year, the balance five years later was below the starting balance of $500,000 only 14.3% of the time.

- **RMD withdrawals.** The average ending balance after 25 years of withdrawals under the RMD was $714,686 and the ending balance was below the starting balance only 27.1% of the time. The fact that the ending balance after 25 years was "underwater" (below the starting balance) 27.1% of the time is not terribly surprising, considering that the average amount of money withdrawn under the RMD (in total) over each 25-year period was over $1.3 million.

  Interestingly, with RMD withdrawals, the ending balance after 25 years was higher than the balance after five years in 60% of the rolling 25-year periods. You might think of this as a "stay-with-it" measurement. In other words, **a rough sequence of returns in a retirement portfolio during the first four or five years does *not* necessarily mean the portfolio is headed for destruction**.

  Based on this analysis, more often than not, the portfolio will finish on higher ground if the retiree stays with it and doesn't bail out. **In no case did the portfolio run out of money within 25 years using the RMD.** That outcome is simply baked into the math of only withdrawing a percentage of the portfolio's value each year—which is what the RMD does.

- **COLA withdrawal method.** If withdrawing money with a COLA option, the final balance after 25 years averaged $1.8 million after withdrawing $729,185 in each 25-year period. The ending balance after 25 years was lower than the starting balance only 7.1% of the time and higher than the balance after five years 94.3% of the time. The COLA-based withdrawal system caused one portfolio failure within 25 years (the period from 1929–1953).

- **Four percent withdrawals.** Finally, if withdrawing four percent of the portfolio value at the end of each year, the portfolio had an average ending balance of $1.5 million after 25 years and never had an ending balance after 25 years that was below the starting balance of $500,000. Even better, the balance after 25 years was higher than the balance after five years 100% of the time. On average, the retiree withdrew $906,753 over each 25-year period. Based on these results, the portfolio obviously never failed within 25 years.

With such encouraging findings from this analysis, is there any bad news for retirees that are withdrawing money from their portfolio? Of course. A ridiculous initial withdrawal rate, such as eight percent, followed by a four percent COLA will break most any portfolio before 25 years. In fact, that particular scenario led to failure in 81.4% of the rolling 25-year periods. (The spreadsheet used to do this analysis was developed by the author. For information, contact me at Craig@7TwelvePortfolio.com.)

The key to keeping a retirement portfolio alive for at least 25 years is a broadly diversified asset mix, a modest withdrawal rate, and patience. Stay with it!

Table 1: $500,000 Retirement Portfolio With RMD-Based Withdrawals
Equally weighted 4-asset portfolio, 100 bps expense ratio

RMD-based withdrawals 25-year withdrawal periods (n=70)	Starting balance at age 72	Portfolio balance at age 77	Portfolio Balance after 25 Years at age 97	TOTAL 25-Year withdrawal	Average annual withdrawal
1926-1950	500,000	436,753	378,839	758,424	30,337
1927-1951	500,000	311,976	393,003	780,770	31,231
1928-1952	500,000	263,674	356,718	721,280	28,851
1929-1953	500,000	321,975	281,183	623,178	24,927
1930-1954	500,000	400,043	427,919	763,999	30,560
1931-1955	500,000	580,457	567,439	966,811	38,672
1932-1956	500,000	993,442	787,095	1,434,482	57,379
1933-1957	500,000	770,806	766,142	1,617,301	64,692
1934-1958	500,000	593,390	648,669	1,148,071	45,923
1935-1959	500,000	555,991	648,994	1,169,983	46,799
1936-1960	500,000	432,786	534,928	1,033,887	41,355
1937-1961	500,000	315,857	483,547	870,848	34,834
1938-1962	500,000	498,071	619,218	1,274,995	51,000
1939-1963	500,000	547,783	591,857	1,167,716	46,709
1940-1964	500,000	648,057	658,722	1,258,346	50,334
1941-1965	500,000	867,407	789,348	1,423,182	56,927
1942-1966	500,000	876,144	813,448	1,666,589	66,664
1943-1967	500,000	762,637	912,564	1,555,996	62,240
1944-1968	500,000	590,003	801,948	1,312,935	52,517
1945-1969	500,000	549,208	612,695	1,219,783	48,791
1946-1970	500,000	498,593	476,885	1,016,311	40,652
1947-1971	500,000	571,976	562,225	1,161,879	46,475
1948-1972	500,000	596,241	597,877	1,238,898	49,556
1949-1973	500,000	584,514	528,848	1,332,680	53,307
1950-1974	500,000	690,631	430,125	1,297,964	51,919
1951-1975	500,000	659,078	466,063	1,161,961	46,478
1952-1976	500,000	625,238	550,384	1,147,876	45,915
1953-1977	500,000	562,903	551,073	1,168,062	46,722
1954-1978	500,000	735,432	618,026	1,287,629	51,505
1955-1979	500,000	606,091	567,775	1,068,742	42,750
1956-1980	500,000	546,110	614,580	1,021,784	40,871
1957-1981	500,000	614,328	618,698	1,086,559	43,462
1958-1982	500,000	623,365	811,598	1,253,471	50,139
1959-1983	500,000	547,324	745,848	1,079,595	43,184
1960-1984	500,000	568,542	728,763	1,113,214	44,529
1961-1985	500,000	641,001	892,184	1,208,389	48,336
1962-1986	500,000	535,504	852,711	1,161,586	46,463
1963-1987	500,000	718,256	885,082	1,351,500	54,060
1964-1988	500,000	727,730	898,438	1,331,318	53,253
1965-1989	500,000	598,894	952,233	1,325,415	53,017
1966-1990	500,000	531,720	801,679	1,291,833	51,673
1967-1991	500,000	605,412	1,039,673	1,466,039	58,642
1968-1992	500,000	507,271	878,437	1,273,870	50,955
1969-1993	500,000	401,892	847,843	1,243,459	49,738
1970-1994	500,000	395,994	907,688	1,502,270	60,091
1971-1995	500,000	491,964	1,104,222	1,627,965	65,119
1972-1996	500,000	559,962	1,116,103	1,639,123	65,565
1973-1997	500,000	551,704	1,224,147	1,695,641	67,826
1974-1998	500,000	667,151	1,480,497	2,101,224	84,049
1975-1999	500,000	872,100	1,814,927	2,594,726	103,789
1976-2000	500,000	840,057	1,432,588	2,304,017	92,161
1977-2001	500,000	693,926	1,126,097	2,032,179	81,287
1978-2002	500,000	802,629	950,410	2,103,479	84,139
1979-2003	500,000	860,367	1,055,990	2,086,503	83,460
1980-2004	500,000	765,019	964,751	1,920,975	76,839
1981-2005	500,000	776,532	814,745	1,721,635	68,865
1982-2006	500,000	829,757	867,799	1,795,116	71,805
1983-2007	500,000	679,304	726,721	1,588,381	63,535
1984-2008	500,000	660,431	497,560	1,464,673	58,587
1985-2009	500,000	737,193	545,996	1,476,151	59,046
1986-2010	500,000	583,220	497,885	1,276,561	51,062
1987-2011	500,000	655,379	449,160	1,225,648	49,026
1988-2012	500,000	709,251	487,312	1,295,372	51,815
1989-2013	500,000	685,462	506,241	1,210,829	48,433
1990-2014	500,000	578,872	453,975	1,100,240	44,010
1991-2015	500,000	727,812	454,906	1,201,797	48,072
1992-2016	500,000	652,089	397,261	1,024,678	40,987
1993-2017	500,000	704,897	402,445	1,000,017	40,001
1994-2018	500,000	701,194	346,365	966,165	38,647
1995-2019	500,000	784,366	410,871	1,026,689	41,068
AVERAGE		622,588	714,686	1,326,295	53,052
Maximum		993,442	1,814,927	2,594,726	103,789
Minimum		263,674	281,183	623,178	24,927
Percent of time below starting balance (cells in red)		17.1%	27.1%	0.0%	–
Percent of time ending balance > Balance after 5 years		–	60.0%	–	–

Source: Craig Israelsen, PhD

Table 2: $500,000 Retirement Portfolio With 4% First-Year Withdrawal ($20,000) Followed by 3% Annual COLA
Equally weighted 4-asset portfolio, 100 bps expense ratio

4% Initial, 3% COLA 25-year withdrawal periods (n=70)	Starting balance at age 72	Portfolio balance at age 77	Portfolio balance after 25 Years at age 97	TOTAL 25-Year withdrawal	Average annual withdrawal
1926-1950	500,000	445,355	356,184	729,185	29,167
1927-1951	500,000	314,402	391,729	729,185	29,167
1928-1952	500,000	248,469	188,534	729,185	29,167
1929-1953	500,000	281,195	(80,579)	729,185	29,167
1930-1954	500,000	368,761	333,475	729,185	29,167
1931-1955	500,000	567,675	981,516	729,185	29,167
1932-1956	500,000	1,028,776	2,244,440	729,185	29,167
1933-1957	500,000	819,177	2,400,239	729,185	29,167
1934-1958	500,000	609,912	1,466,416	729,185	29,167
1935-1959	500,000	570,336	1,478,800	729,185	29,167
1936-1960	500,000	427,969	975,828	729,185	29,167
1937-1961	500,000	299,841	588,207	729,185	29,167
1938-1962	500,000	496,692	1,521,419	729,185	29,167
1939-1963	500,000	534,397	1,309,586	729,185	29,167
1940-1964	500,000	642,083	1,610,497	729,185	29,167
1941-1965	500,000	881,727	2,193,972	729,185	29,167
1942-1966	500,000	918,290	2,583,982	729,185	29,167
1943-1967	500,000	799,855	2,737,073	729,185	29,167
1944-1968	500,000	608,913	2,079,877	729,185	29,167
1945-1969	500,000	554,217	1,465,456	729,185	29,167
1946-1970	500,000	487,333	881,915	729,185	29,167
1947-1971	500,000	571,177	1,280,608	729,185	29,167
1948-1972	500,000	602,994	1,483,345	729,185	29,167
1949-1973	500,000	598,298	1,450,306	729,185	29,167
1950-1974	500,000	701,880	1,178,883	729,185	29,167
1951-1975	500,000	663,922	1,131,906	729,185	29,167
1952-1976	500,000	633,339	1,315,321	729,185	29,167
1953-1977	500,000	576,229	1,362,285	729,185	29,167
1954-1978	500,000	756,964	1,679,580	729,185	29,167
1955-1979	500,000	610,350	1,238,171	729,185	29,167
1956-1980	500,000	547,419	1,238,728	729,185	29,167
1957-1981	500,000	621,979	1,360,808	729,185	29,167
1958-1982	500,000	641,612	2,048,690	729,185	29,167
1959-1983	500,000	549,605	1,536,173	729,185	29,167
1960-1984	500,000	570,963	1,535,163	729,185	29,167
1961-1985	500,000	646,741	2,011,573	729,185	29,167
1962-1986	500,000	536,999	1,772,925	729,185	29,167
1963-1987	500,000	734,355	2,191,586	729,185	29,167
1964-1988	500,000	743,579	2,144,948	729,185	29,167
1965-1989	500,000	614,489	2,200,652	729,185	29,167
1966-1990	500,000	539,912	1,760,370	729,185	29,167
1967-1991	500,000	625,162	2,595,190	729,185	29,167
1968-1992	500,000	505,821	1,775,882	729,185	29,167
1969-1993	500,000	392,270	1,576,207	729,185	29,167
1970-1994	500,000	394,811	2,179,437	729,185	29,167
1971-1995	500,000	488,883	2,841,363	729,185	29,167
1972-1996	500,000	548,537	2,853,355	729,185	29,167
1973-1997	500,000	539,011	3,179,353	729,185	29,167
1974-1998	500,000	675,874	4,542,755	729,185	29,167
1975-1999	500,000	913,459	6,297,528	729,185	29,167
1976-2000	500,000	869,358	4,790,975	729,185	29,167
1977-2001	500,000	708,623	3,574,317	729,185	29,167
1978-2002	500,000	826,282	3,195,666	729,185	29,167
1979-2003	500,000	892,806	3,565,274	729,185	29,167
1980-2004	500,000	792,959	3,156,214	729,185	29,167
1981-2005	500,000	795,199	2,528,263	729,185	29,167
1982-2006	500,000	863,376	2,811,885	729,185	29,167
1983-2007	500,000	701,538	2,203,771	729,185	29,167
1984-2008	500,000	675,681	1,478,989	729,185	29,167
1985-2009	500,000	760,465	1,655,108	729,185	29,167
1986-2010	500,000	592,687	1,332,321	729,185	29,167
1987-2011	500,000	661,573	1,173,465	729,185	29,167
1988-2012	500,000	728,745	1,371,063	729,185	29,167
1989-2013	500,000	702,516	1,339,845	729,185	29,167
1990-2014	500,000	587,532	1,086,282	729,185	29,167
1991-2015	500,000	751,901	1,233,785	729,185	29,167
1992-2016	500,000	661,025	892,561	729,185	29,167
1993-2017	500,000	715,821	878,663	729,185	29,167
1994-2018	500,000	714,179	728,094	729,185	29,167
1995-2019	500,000	815,566	953,958	729,185	29,167
AVERAGE		632,426	1,820,316	729,185	29,167
Maximum		1,028,776	6,297,528	729,185	29,167
Minimum		248,469	-80,579	729,185	29,167
Percent of time below starting balance (cells in red)		17.1%	7.1%	0.0%	--
Percent of time ending balance > Balance after 5 years		--	94.3%	--	--

Source: Craig Israelsen, PhD

Table 3: $500,000 Retirement Portfolio With 4% of Portfolio Balance Annual Withdrawals
Equally weighted 4-asset portfolio, 100 bps expense ratio

4% of Portfolio balance 25-year withdrawal periods (n=70)	Starting balance at age 72	Portfolio balance at age 77	Portfolio balance after 25 Years at age 97	TOTAL 25-year withdrawal	Average annual withdrawal
1926-1950	500,000	441,618	805,529	537,935	21,517
1927-1951	500,000	316,070	834,878	551,206	22,048
1928-1952	500,000	266,763	758,019	506,451	20,258
1929-1953	500,000	324,532	601,365	434,841	17,394
1930-1954	500,000	402,908	900,290	529,355	21,174
1931-1955	500,000	584,393	1,190,031	666,397	26,656
1932-1956	500,000	1,001,298	1,662,133	986,605	39,464
1933-1957	500,000	779,367	1,637,737	1,112,991	44,520
1934-1958	500,000	599,307	1,366,715	791,834	31,673
1935-1959	500,000	561,742	1,369,143	805,758	32,230
1936-1960	500,000	436,997	1,133,345	710,380	28,415
1937-1961	500,000	318,918	1,017,796	597,283	23,891
1938-1962	500,000	502,798	1,319,640	871,277	34,851
1939-1963	500,000	552,098	1,255,900	798,431	31,937
1940-1964	500,000	652,843	1,393,737	860,410	34,416
1941-1965	500,000	873,736	1,662,919	973,992	38,960
1942-1966	500,000	884,306	1,732,969	1,142,156	45,686
1943-1967	500,000	770,233	1,916,807	1,069,524	42,781
1944-1968	500,000	596,039	1,678,225	902,958	36,118
1945-1969	500,000	554,423	1,303,304	837,466	33,499
1946-1970	500,000	502,726	1,018,726	697,574	27,903
1947-1971	500,000	576,826	1,197,901	796,927	31,877
1948-1972	500,000	601,520	1,274,015	850,216	34,009
1949-1973	500,000	590,199	1,146,455	915,850	36,634
1950-1974	500,000	696,622	946,333	894,895	35,796
1951-1975	500,000	664,581	1,008,930	804,587	32,183
1952-1976	500,000	630,667	1,174,619	797,040	31,882
1953-1977	500,000	568,426	1,177,490	812,602	32,504
1954-1978	500,000	742,143	1,318,163	897,345	35,894
1955-1979	500,000	611,426	1,200,252	745,905	29,836
1956-1980	500,000	550,924	1,286,555	712,385	28,495
1957-1981	500,000	619,729	1,301,367	755,698	30,228
1958-1982	500,000	629,504	1,690,530	870,187	34,807
1959-1983	500,000	552,281	1,544,587	747,174	29,887
1960-1984	500,000	573,605	1,515,813	766,616	30,665
1961-1985	500,000	646,470	1,838,513	828,493	33,140
1962-1986	500,000	541,179	1,759,707	793,227	31,729
1963-1987	500,000	725,336	1,843,502	917,821	36,713
1964-1988	500,000	734,841	1,866,006	901,409	36,056
1965-1989	500,000	605,448	1,967,651	894,382	35,775
1966-1990	500,000	537,613	1,676,282	868,121	34,725
1967-1991	500,000	612,051	2,151,956	983,052	39,322
1968-1992	500,000	512,641	1,820,830	851,618	34,065
1969-1993	500,000	406,427	1,758,266	828,290	33,132
1970-1994	500,000	400,774	1,901,273	997,611	39,904
1971-1995	500,000	497,242	2,292,376	1,080,825	43,233
1972-1996	500,000	565,337	2,315,576	1,087,437	43,497
1973-1997	500,000	557,012	2,527,907	1,124,269	44,971
1974-1998	500,000	673,745	3,063,316	1,392,367	55,695
1975-1999	500,000	880,811	3,758,743	1,721,294	68,852
1976-2000	500,000	848,125	2,994,816	1,530,888	61,236
1977-2001	500,000	700,877	2,375,900	1,353,272	54,131
1978-2002	500,000	810,377	2,040,797	1,404,928	56,197
1979-2003	500,000	868,680	2,246,514	1,400,545	56,022
1980-2004	500,000	772,776	2,052,790	1,295,068	51,803
1981-2005	500,000	783,973	1,741,200	1,165,323	46,613
1982-2006	500,000	837,997	1,850,607	1,220,113	48,805
1983-2007	500,000	686,466	1,556,001	1,083,935	43,357
1984-2008	500,000	667,208	1,094,579	1,003,299	40,132
1985-2009	500,000	744,587	1,191,324	1,016,873	40,675
1986-2010	500,000	589,425	1,080,412	884,059	35,362
1987-2011	500,000	661,812	979,096	852,377	34,095
1988-2012	500,000	716,416	1,059,130	905,104	36,204
1989-2013	500,000	692,413	1,090,322	850,122	34,005
1990-2014	500,000	585,023	978,382	775,153	31,006
1991-2015	500,000	735,205	987,408	849,232	33,969
1992-2016	500,000	658,587	859,726	726,894	29,076
1993-2017	500,000	711,714	867,984	711,155	28,446
1994-2018	500,000	708,093	754,360	688,404	27,536
1995-2019	500,000	792,315	886,733	733,525	29,341
AVERAGE		**628,579**	**1,508,174**	**906,753**	**36,270**
Maximum		1,001,298	3,758,743	1,721,294	68,852
Minimum		266,763	601,365	434,841	17,394
Percent of time below starting balance (cells in red)		14.3%	0.0%	1.4%	—
Percent of time ending balance > Balance after 5 years		—	100%	—	—

Source: Craig Israelsen, PhD

Craig L. Israelsen, PhD, is an Executive-in-Residence in the Personal Financial Planning program in the Woodbury School of Business at Utah Valley University. He is the developer of the 7Twelve® Portfolio. Learn more at www.7TwelvePortfolio.com.

IMPORTANT NOTICE