The Hidden Trap of Average Annualized Returns
and
The Adaptive 5% Solution

Nearly everyone is familiar with the oft-repeated investment industry disclaimer—past performance is not a guarantee of future results. Nonetheless, past performance is frequently the first thing investors evaluate in a money manager or mutual fund. After all, historical results are ***relevant***, even if they are not necessarily ***predictive***. However, in evaluating historical results, investors rarely consider the fact that ***average*** annual returns may conceal significant variation in the annual returns being averaged. Although year-to-year peaks and valleys (and the timing thereof) may matter little to long-term, buy-and-hold investors, the variation—and order—of yearly returns ***can matter a lot*** to those who periodically withdraw and spend their savings. For example, would it surprise you to learn that a portfolio achieving an average annualized return of 8% may be unable to sustain annual withdrawals representing 7% of the original principal? In this article we'll discuss this seemingly counterintuitive possibility and offer suggestions to investors attempting to intelligently evaluate their financial nest eggs.

While investment managers typically encourage a long-term focus among their clients and extol the virtues of making regular account ***deposits***, the fact remains that many people, such as retirees, make regular ***withdrawals***. Spending is fine—that's what savings are ultimately for—but spenders may stumble into a dangerous trap if they make plans based entirely on expected average returns.

Let's explore this situation using some recent market history. During the 24 years between January 1, 1993 and December 31, 2016, the S&P 500 achieved a 9.21% average annualized return. An investor who started with $500,000 at the end of 1992, made no withdrawals or deposits, and duplicated the S&P 500's performance, would have amassed about $4,143,000 at the end of 2016. Along the way, the investor's portfolio would have experienced nice annual gains (such as 37.58% in 1995 and 32.39% in 2013) and not-so-nice losses (such as -37.00% in 2008 and -22.10% in 2002). With the best yearly performance of the 24-year period exceeding the worst by a whopping 74 percentage points, and the second-best year outperforming the second-worst by 55 percentage points, there can obviously be a very wide dispersion of actual annual returns hidden in a multi-year average.

Let's imagine what would happen if the yearly returns had occurred in a different order. The following table summarizes the S&P 500 between 1993 and 2016 in three sequences: as the returns actually occurred, shuffled from low to high, and then shuffled from high to low.

	S&P 500 Returns: 1993 - 2016	S&P 500 Returns: Shuffled Low to High	S&P 500 Returns: Shuffled High to Low
1993	10.08%	-37.00	37.58
1994	1.32	-22.10	33.36
1995	37.58	-11.89	32.39
1996	22.96	-9.10	28.68
1997	33.36	1.32	28.58
1998	28.58	1.38	26.46
1999	21.04	2.11	22.96
2000	-9.10	4.91	21.04
2001	-11.89	5.49	16.00
2002	-22.10	10.08	15.79
2003	28.68	10.88	15.06
2004	10.88	11.96	13.69
2005	4.91	13.69	11.96
2006	15.79	15.06	10.88
2007	5.49	15.79	10.08
2008	-37.00	16.00	5.49
2009	26.46	21.04	4.91
2010	15.06	22.96	2.11
2011	2.11	26.46	1.38
2012	16.00	28.58	1.32
2013	32.39	28.68	-9.10
2014	13.69	32.39	-11.89
2015	1.38	33.36	-22.10
2016	11.96	37.58	-37.00

Table 1

If the investor makes no deposits or withdrawals, all three sequences eventually arrive at the same portfolio value—as shown in Chart 1—although you'll notice that each shuffle travels a different road.
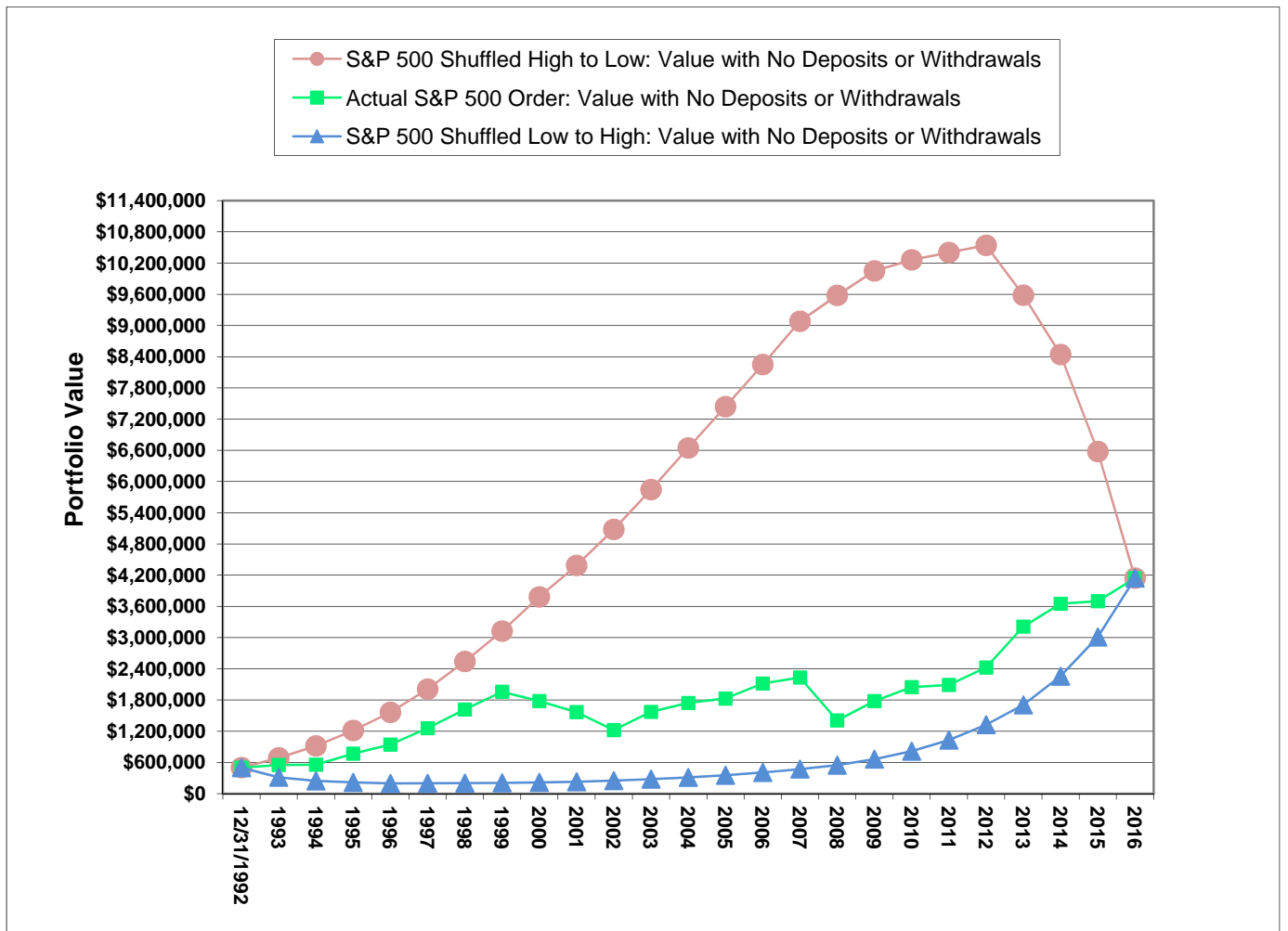
Chart 1

The twists along each road can significantly impact the portfolio's ending valuation *if* the investor makes withdrawals (or deposits)—because it can make a ***big*** difference whether the relatively stronger years fall nearer the beginning or end of the period. For example, poor performance in the early years cannot be offset by strong performance later on for that portion of the portfolio that has already been withdrawn.

Since the hypothetical $500,000 portfolio earned an average annualized return of 9.21%, it might seem as though it could indefinitely sustain a 7% annual withdrawal—$35,000 each year—no matter what the order of returns. Indeed, given the actual 1993 – 2016 return sequence of the S&P 500, the investor could have withdrawn $35,000 each year and still owned a portfolio worth over $1,773,000 at the end of 2016. But now consider the case in which the yearly returns begin with the lowest and progress to the highest. If the investor withdraws $35,000 each year in this low-to-high scenario, the portfolio will be depleted before the best years arrive! Chart 2 shows the results. Although shuffling yearly returns doesn't change the average annualized return of 9.21%, early poor years can—and in this case do—have a devastating effect on the spender.
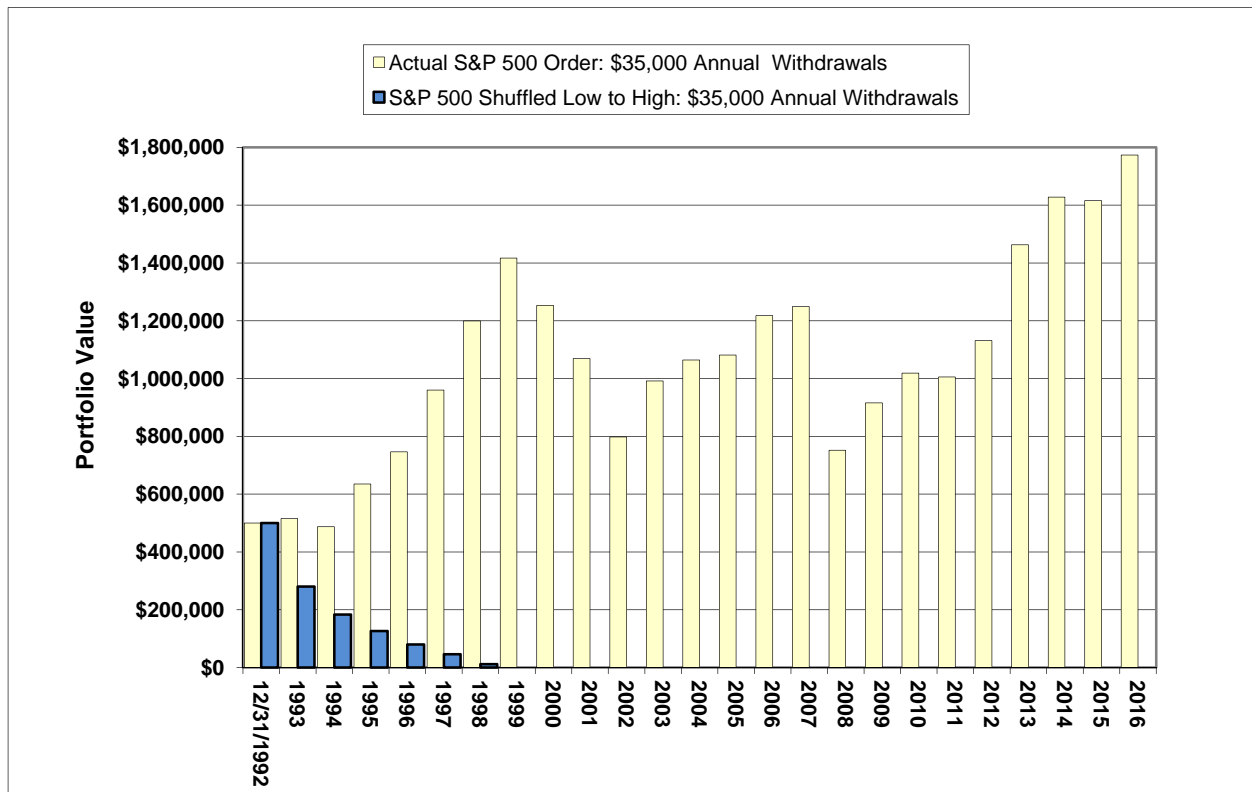
Chart 2

If we rearrange the S&P 500 returns again—this time from highest to lowest—the results change dramatically. As Chart 3 shows, this time the investor can comfortably withdraw $35,000 per year while watching the account grow to over $3 million—significantly higher than would have been the case with the S&P 500's actual sequence of returns. Basically, the investor's early gains provided a cushion against the down years to come.

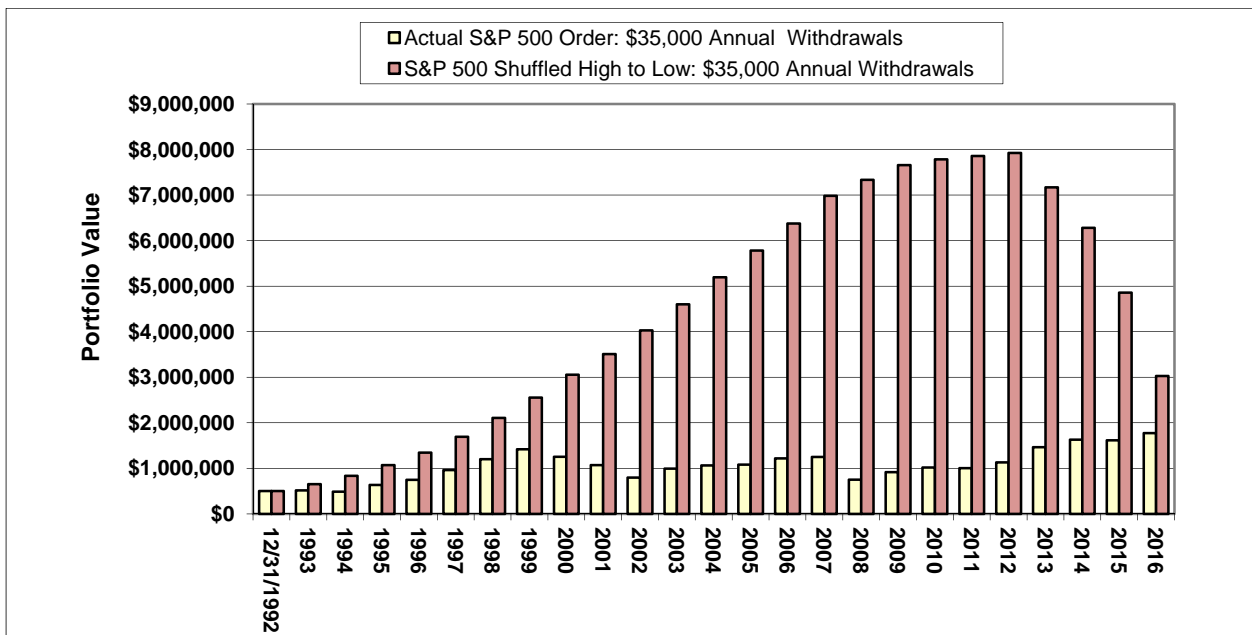Chart 3

For a *saver*, the worst-to-best S&P 500 contributes to a portfolio bonanza. Annual $35,000 *deposits* allow the investor to take advantage of relatively bargain prices early on—essentially adding fuel to the fire of the good returns in later years. Thus, as shown in Chart 4, the saver's account grows to just over $13.8 million by the end of 2016, considerably more than the actual sequence of S&P 500 returns.
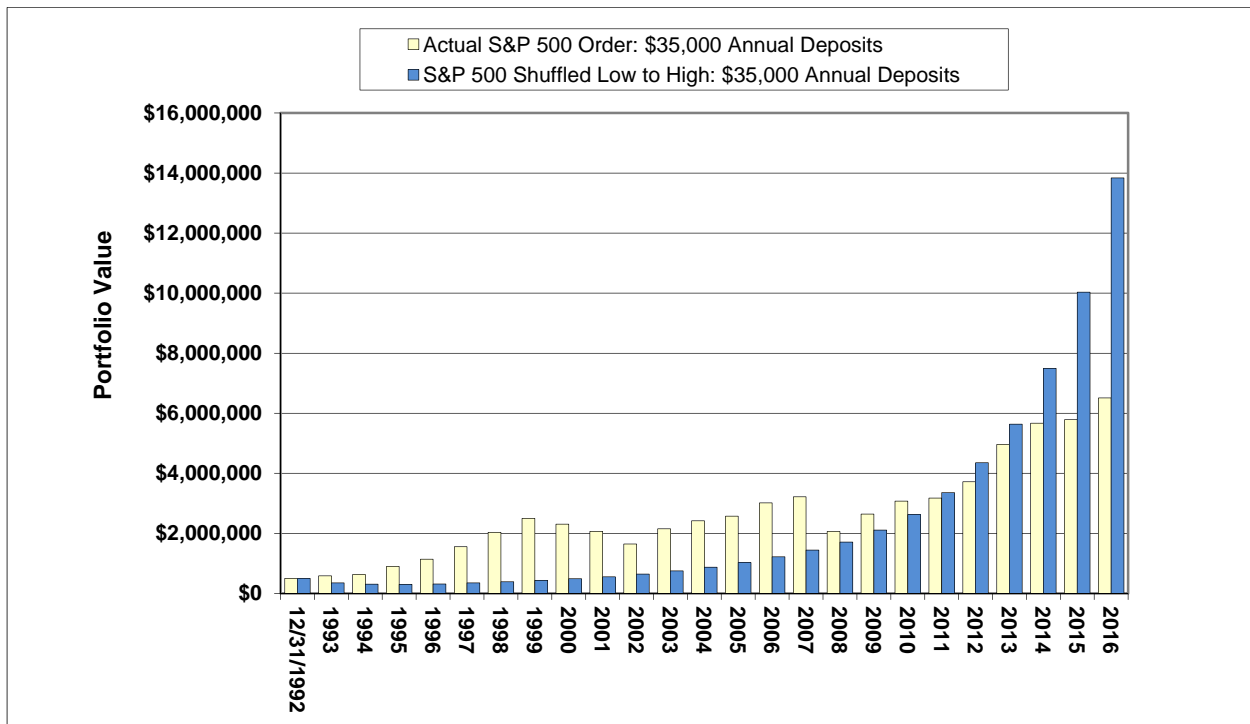
Chart 4

In contrast, savers don't do as well when high-return years come early—they're forced to buy at higher prices in the early years, and their relatively bargain-priced purchases in the last years don't have the benefit of time to grow. Thus, as shown in Chart 5, it's no surprise that their results fall short of what would have happened with the actual return sequence.
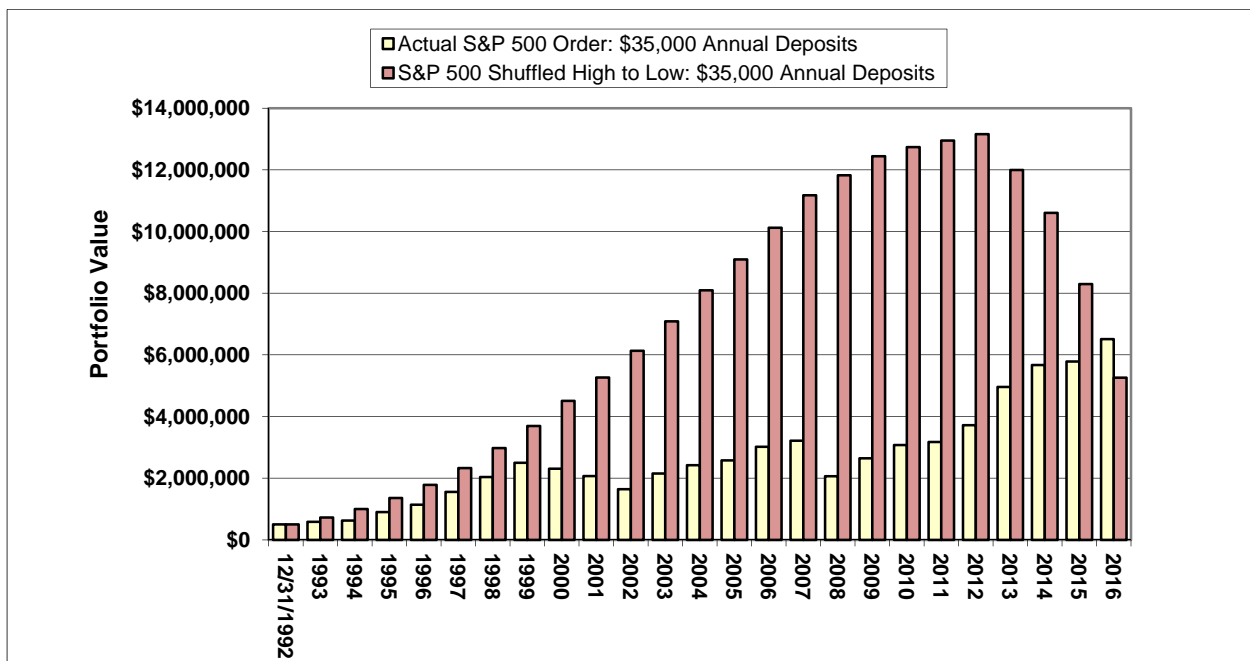

Chart 5

Clearly, while the order of returns can affect investors who save, the potentially more dangerous impact is on those who spend. Simply put, withdrawals can put a portfolio at serious risk. So how should investors intelligently tap their retirement nest eggs? As we see it, there are two prudent choices: One way to guard against the undesirable effects of below average early returns is to establish a conservative withdrawal rate. For example, investors who expect an average annual return of 8% (or less) could plan to withdraw only 4% of the original principal each year. Based on our analysis of S&P 500 returns since 1926, this technique would have protected an account from depletion in the large majority of 20-year

periods, even if annual withdrawals were increased each year to match inflation. However, this might prove to be too conservative in all but the worst environments. Another method, which we call the "Adaptive 5% Solution," would be to withdraw 5% of the account's value each year, based on annually updated portfolio valuations. This technique allows withdrawals to grow as portfolio values grow, but when portfolio values decline, it requires that withdrawals shrink as well. Put differently, investors who can tighten their belts after lean investment returns can relax their withdrawal limits after stronger years to enjoy the fruits of the better years.

Remember how, in the low-to-high shuffle, $35,000 annual withdrawals depleted the portfolio before the best years arrived? Chart 6 shows how withdrawals based on The Adaptive 5% Solution would have allowed the portfolio to survive and grow.
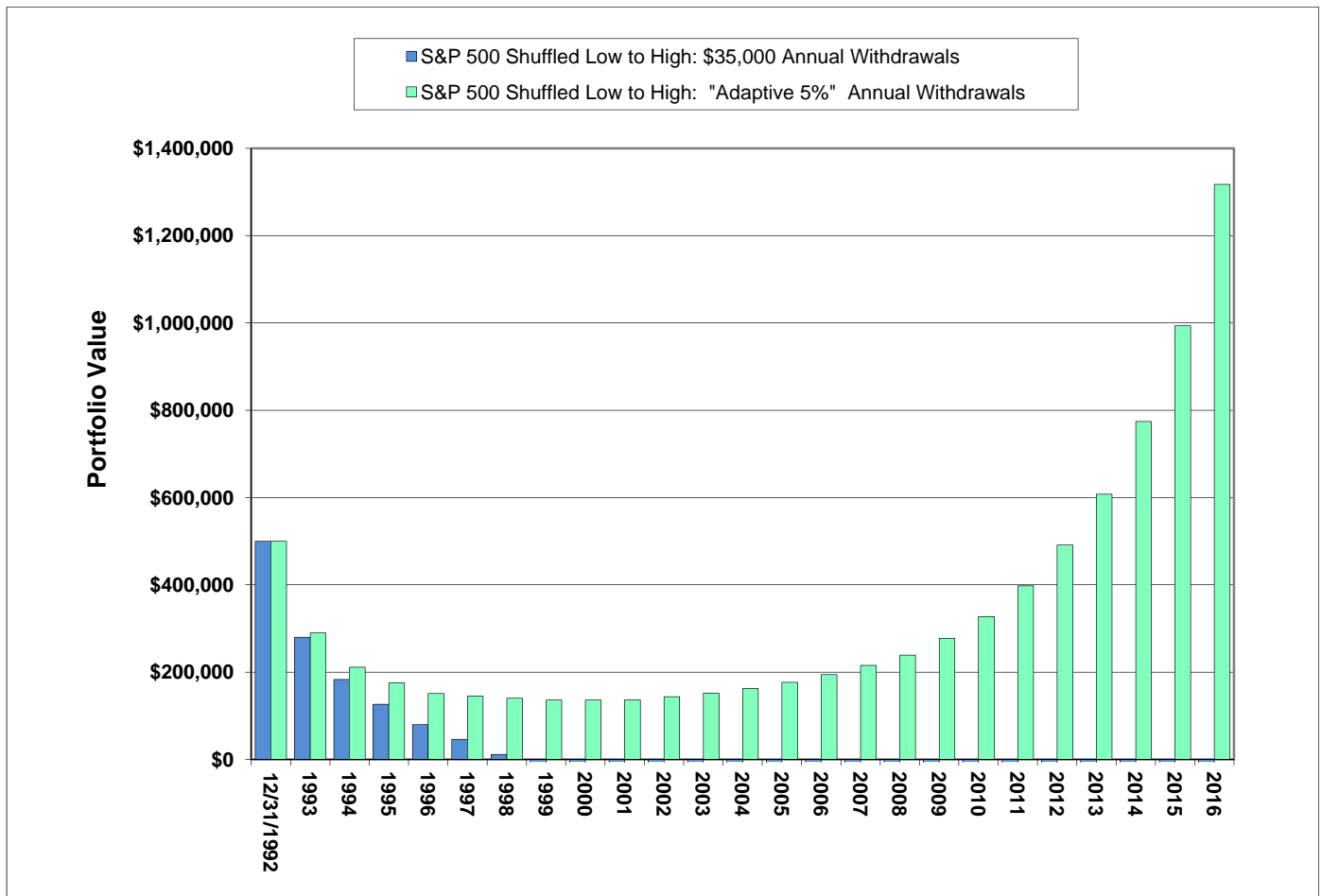

Chart 6

The advantage of The Adaptive 5% Solution is in the ***long-term*** viability of a portfolio. Over time, a preserved portfolio will generate returns that can be tapped for future years of withdrawals, while a depleted portfolio ceases to generate any funds at all.

In summary, we're sounding a note of caution to investors planning to live off their savings. Average annualized past performance truly is not a guarantee of future results. For this reason alone, investors should incorporate a cushion between ***hoped-for*** returns and ***counted-on*** returns. Further, even when average annual returns meet or exceed past performance, adding flexibility—via a sufficiently conservative withdrawal rate or the Adaptive 5% Solution—can help protect investors against the effect of lower returns in the early years, when a portfolio can least bear them.

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