

# Retirement Planning:

## Part 4: Cash & Equities During the Last 100 Years

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Continuing with our series on retirement planning, we will now look at investing in “cash” and a mix of cash and equity based on last one hundred years of data.

This time, I asked myself a simple question: If I started my retirement with one million dollars invested in “cash” (such as money market), and withdrew a certain amount of income each year, how would my portfolio hold up if I retired at the beginning of 1900? Then I did the same calculations if I retired at the beginning of 1901, 1902 and so on. I did these calculations for the entire one hundred years.

All withdrawals are adjusted for inflation. I used the annual average wholesale price index by the U.S. Bureau of Labour Statistics for the years between 1900 and 1913. For the years after 1913, I used the consumer price index from the same source. When I talk about a 4% “initial withdrawal rate”, it means that the withdrawal is 4% of the initial portfolio value in the first year. After that, the withdrawals are adjusted for inflation each year. When I talk about a “current withdrawal rate”, it is the current withdrawal amount divided by the current portfolio value.

For the interest rates, I used the Federal Reserve historic database.

The limited space here does not allow me to show the portfolio performance for each and every year. I included in Figure 1 the portfolio performance for the years 1929, 1966 and 1933. These charts are based on an initial withdrawal of \$60,000 per year (6% initial withdrawal rate) adjusted for actual inflation. For comparison purposes, I also included the asset values of a 100% equity portfolio (DJIA) and a standard retirement plan projection based on a steady state growth rate of 8% per year and an annual inflation rate of 3.5%.

Figure 2 shows the probability of depleting the portfolio after 5, 10, 15, 20, 25 and 30 years for different withdrawal rates.

A cash portfolio has a smaller probability of depletion in the shorter term compared to an equity portfolio. Depending on the withdrawal rates, after a certain time, the probability of depletion of the cash portfolio jumps rapidly and surpasses that of the equity portfolio.

Let’s look at the initial withdrawal rate of 6%: After ten years, there was a 4% chance of going broke in an equity portfolio and a 0% chance of going broke in a “cash” portfolio. After fifteen years, the probability

increased to 42% in an equity portfolio and to 14% in a “cash” portfolio. After twenty years, it increased to 62% in an equity portfolio, and jumped to 77% in a “cash” portfolio.

Such a sudden jump of probability of depletion in a “cash” portfolio happened at all withdrawal rates over 4%. This is where the old adage that equity investing is for the long-term proves to be correct.

What is long-term anyway? Without defining what the long-term is, how can we establish effective strategies?

For an income portfolio, I define long-term as “the number of years at which the probability of depletion of a cash portfolio exceeds the probability of depletion of an equity portfolio.”

Long-term depends on how much you need to withdraw from your portfolio. For example if your initial withdrawal rate is only 4% then long-term is twenty-nine years. This is so because if your initial withdrawal rate was 4%, it took on average twenty-nine years until the risk of going broke by holding cash exceeded the risk of going broke by holding an equity portfolio. For an initial withdrawal rate of 6%, long-term happened to be nineteen years. For an initial withdrawal rate of 8%, long-term is fourteen years, and so on. The more income you need from your portfolio, the shorter is your “long-term”. That is why investors are compelled to invest in equities, if they need to withdraw larger amounts from their portfolios.

Figure 3 depicts the value of long-term based on the initial withdrawal rate. Knowing your own “long-term” and matching it to your own life expectancy will minimize the risk of holding excessive cash or equity in your portfolio. I will elaborate on optimum portfolios in future articles.

If your life expectancy is less than your particular long-term (expressed in number of years) then “cash” portfolio gives you the certainty of income during your lifetime. By taking additional risk and investing in equities, you can then strive to increase the estate value of your portfolio.

If your initial withdrawal rate is 2% or less, then it did not matter whether your portfolio is invested all in cash, or all in equities, or any combination of the two. You can choose any asset mix that you feel comfortable with. The risk of depletion over a thirty year retirement time period was practically nil for initial withdrawal rate of 2% or less.

If your initial withdrawal rate was 3% then the risk of depletion was also nil, provided that you had a cash/equity mix of 50/50, rebalanced annually.

Let's talk about one of the popular techniques in portfolio design. It is called "strategic asset allocation". Some people overestimate its benefits and apply it to all investment portfolios. It is embraced by the financial industry because it is easy to sell and easy to maintain. However, there is usually a price to pay when you adopt "no-brainer" techniques.

In strategic asset allocation, first the "ideal" mix of equity, bond and cash is determined based on investor's risk tolerance. After implementing the investment plan, the portfolio is rebalanced periodically so that the percentages of the asset mix remain the same. Strategic asset allocation attempts to reduce the volatility of investment returns. However, we know by now that in an income portfolio the real risk is running out of money, not the volatility.

Going back to Figure 1, we can observe the asset values over time for a cash/equity<sup>1</sup> mix of 50/50 (typical balanced portfolio) and 70/30 (typical income portfolio). The strategic asset allocation reduced the risk somewhat and added some years to the life of the portfolio in bear markets.

On the other hand, at 6% initial withdrawal rate, a balanced portfolio outlived a standard retirement plan only *twice* out of *seventy* 30-year periods (in 1919 and 1921) and *twice* out of *eighty* 20-year periods (in 1978 and 1979). Obviously, we need to look for better strategies than blindly accepting the strategic asset allocation. We'll do that in future articles.

Beware of standard retirement plan projections. In my previous articles, we have already seen that they are too optimistic compared to real-life. You may want to try fudging up the income required during retirement by about 35% when using a standard retirement plan and that will produce projections that are more in-line with historic reality.

Finally, here is another interesting observation: The portfolio depleted rapidly and decisively once the current withdrawal rate exceeded 12%. Figure 4 shows the remaining portfolio life at high withdrawal rates for both cash and equity portfolios. The solid line is the best fitting trendline, and the dashed lines show the upper and lower range of observations. Once the excessive withdrawal rate is reached, your portfolio is on a slippery slope; nothing can prevent it from collapse except reducing your withdrawals drastically.

Happy retirement!

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Note: Dale suggested that I use my nickname "Jim" to make life easier for everybody. I cheerfully accepted his suggestion.

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<sup>1</sup> One can also use a bond ladder instead of cash. In an income portfolio, bonds are normally held until maturity and the yield is 1.5% to 2.0% higher than cash.

Figure 1: Portfolio Value of equities and cash retiring in the beginning of 1929, 1933 and 1966. The initial withdrawal rate is 6%.

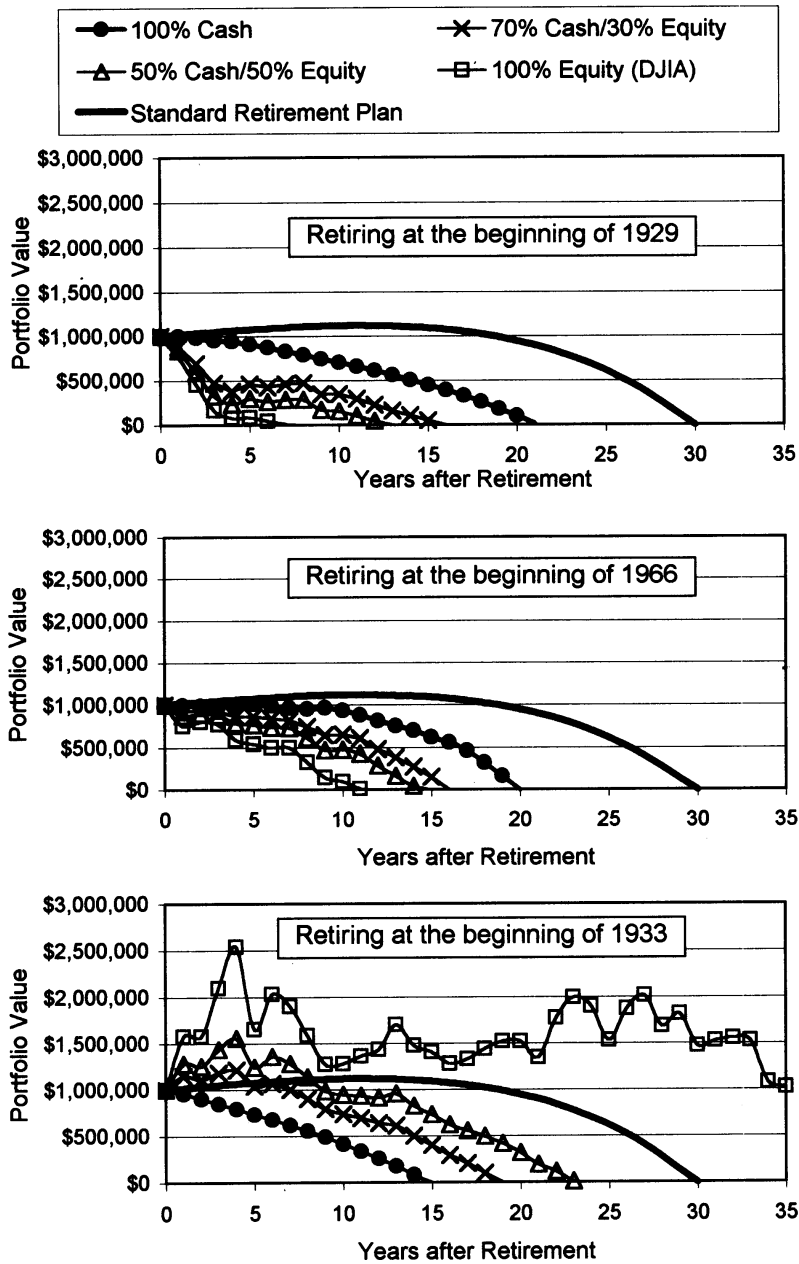


Figure 2: The probability of depleting the portfolio at different withdrawal rates during the last century.

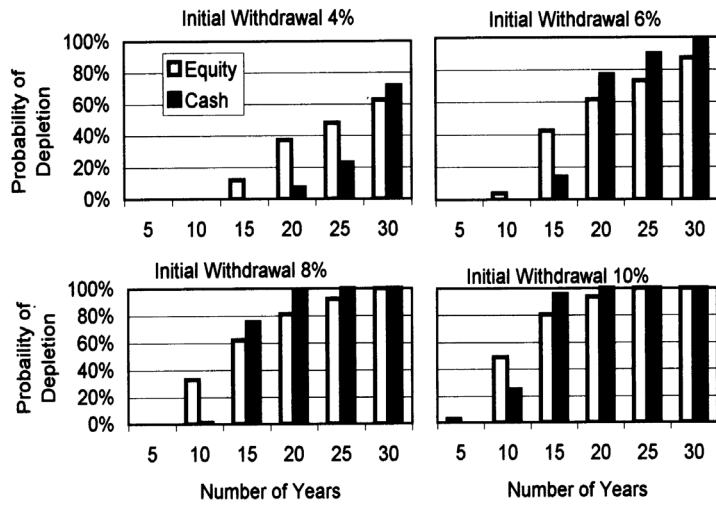


Figure 3: What is long-term? In an income portfolio, the answer depends on how much your withdrawals are.

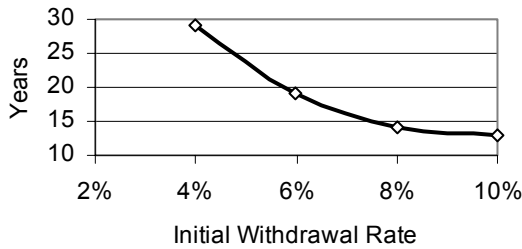


Figure 4: Remaining portfolio life at high withdrawal rates

