

Retirement Planning: Part 2: Equities During the Last 100 Years

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In my previous article on retirement planning, I went over the effects of typical market cycles and the market volatility. Current financial plans base their projections on a steady state rate of growth, whereas in real life, the equity markets fluctuate greatly with potentially devastating effect on your retirement portfolio.

All retirement plans include a disclaimer, something like “markets are subject to fluctuation and future performance may be different than historic data”. The tone of this type of a disclaimer might even give you the impression that the past performance was so good; that the future performance may fail to measure up to it.

Some financial plans go further than that: they show you the historic volatility of your selected asset mix during the last 20 years or so, without incorporating the adverse effects of such volatility into your plan. An investor is led to believe that if only he/she follow a “buy-and-hold” strategy, things would smooth out over the long term. While this may be correct if you do not need any income from your portfolio, it will deplete your portfolio a lot sooner than you think if you need to draw a regular income from your investments.

In this study, I asked myself one simple question: If I started my retirement with one million dollars in equity investments, and withdrew each year a certain amount of income (adjusted for inflation), how would my portfolio hold up if I retired at the end of 1899. Then I did the same calculations if I retired at the end of 1900, 1901, 1902 and so on. I did these calculations for all one hundred years.

I looked at four different withdrawal rates:

- \$40,000 which is 4% of the one million dollars that I start with. This happens to be approximately the average inflation rate over the last 100 years.
- \$60,000 which is 6% of one million dollars. This is approximately the average return of bonds over the last 100 years.
- \$80,000 which is 8% of one million dollars. This is approximately the average return of Dow Jones Industrial Average over the last 100 years.
- \$100,000 which is 10% of one million dollars. This is the growth rate I see often in typical financial plans.

I used the Dow Jones Industrial Average to measure the growth (or shrinkage) of my portfolio, because it is the only readily available measure of stock market performance covering the entire one hundred years.

The withdrawal amounts are adjusted for inflation. I used the annual average wholesale price index, 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.

Because of the space limitation, I am unable to show here the retirement assets for each year of the last century. I picked three specific years: retiring in the beginning of 1929, 1933 and 1966. 1929 was the worst year to retire, 1933 was the best. The prolonged bear markets of 1966-1982 also depleted an equity portfolio quickly, if income was required from the portfolio. Figure 1 depicts these charts using an initial withdrawal rate of \$60,000 per year, adjusted for inflation. For comparison purposes, I also included on each chart a standard retirement plan projection based on a steady state growth rate of 8% per year and inflation rate of 3.5% a year.

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

The good news is that if you had equity investment of one million dollars and started withdrawing \$80,000 (adjusted for inflation) or less, in all cases, you would have sufficient money *for the first five years*.

The bad news is, after the first five years, the probability of going broke increases rapidly as the years go by. For example, if you start withdrawing \$60,000 annually, adjusted for inflation, the chances of going broke was: 4% after 10 years, 38% after 15 years, 59% after 20 years, 72% after 25 years, and 86% after 30 years.

If you start withdrawing \$80,000 annually, adjusted for inflation, the chances of going broke was: 30% after 10 years, 57% after 15 years, 80% after 20 years, 92% after 25 years, and 100% after 30 years.

If you start withdrawing \$100,000 annually, adjusted for inflation, the chances of going broke was: 44% after 10 years, 77% after 15 years, 94% after 20 years, 100% after 25 years.

On the frugal side, even if you start withdrawing \$40,000 annually, adjusted for inflation, the chances of going broke was: 10% after 15 years, 35% after 20 years, 47% after 25 years, and 61% after 30 years.

In a nutshell, during the last one hundred years of stock market history, a withdrawal rate that is higher than 4% (adjusted annually for inflation) was not sustainable.

For proper retirement planning, unless you have a short life expectancy, 4% should be the maximum withdrawal rate from your investment portfolio in your calculations if you are using index funds.

Surely, there were several years that allowed a higher withdrawal rate, but this was such a small probability, no prudent investor should consider this in real-life retirement planning. For example: Say you start with one million dollars in your portfolio and annually withdraw \$60,000 adjusted for inflation. After 30 years, only in 8 times out of 70 your portfolio value was larger than zero! Never mind the estate value, you were broke in 62 out of 70 cases.

Why do we then invest in equities at all during retirement? While there is a significant chance of going broke, there is also some chance that your portfolio appreciates over time, even after withdrawals. However, this probability was significantly smaller than the probability of going broke over longer time periods. Only if your withdrawals from your portfolio are less than 2% (adjusted for inflation), or if you die soon after retirement, then the probability of a larger estate value is higher than the probability of going broke.

Beware of the rosy SWP (Systematic Withdrawal Plan) literature that some mutual funds companies distribute. In their illustrations, some of them only cover the stellar bull markets of the last two decades. Obviously, this is not representative of long-term market behavior.

Estate Values: If you start withdrawing \$40,000 (adjusted for inflation) out of your one million dollar portfolio, you had a 58% chance of having a portfolio value larger than one million dollars after 5 years, 47% after 10 years, 38% after 15 years, 31% after 20 years, 27% after 25 years, and 26% after 30 years.

If you start withdrawing \$60,000 (adjusted for inflation) out of your one million dollar portfolio, you had a 51% chance of having a portfolio value larger than one million dollars after 5 years, 36% after 10 years, 26% after 15 years, 21% after 20 years, 9% after 25 years, and 4% after 30 years.

If you start withdrawing \$80,000 (adjusted for inflation) out of your one million dollar portfolio, you had a 41% chance of having a portfolio value larger than one million dollars after 5 years, 26% after 10 years, 18% after 15 years, 4% after 20 years, and 0% after that.

An average equity mutual fund underperforms its underlying index by about 2%. This obviously presents an uglier picture compared to using the Dow Jones Industrial Average. In a future article, I will write about the results of that, as well as segregated funds and the investment side of typical universal life insurance, as applied to the last one hundred years.

Finally, I took the median of all observations during the last one hundred years and plotted that on the standard retirement plan chart. The median means that one half of the observations are above it and one half below it. The

heavy line on Figure 3 shows the investment asset value after retirement using standard retirement planning software, based on \$60,000 per year withdrawal, adjusted each year for 3.5 % inflation, starting capital of one million dollars, average annual portfolio growth rate of 8%. The thin line shows median of all observations during the last one hundred years of Dow Jones Industrial Average history, the same withdrawal amount adjusted for the real inflation. The difference is significant. Your standard financial plan shows that twenty years after retirement you would still have more money than you started with. In contrast, the history shows, the odds are that you would be broke.

During the first five years, both lines seem to be close to each other. After five years they diverge. Remember in my previous article I mentioned that an average business cycle lasts 61 months, or about 5 years? (50 months of bull market and 11 months of bear market). Do you think that it is a coincidence that these two lines diverge after one business cycle? It is not a coincidence.

In my next article, I will talk about the two sinister forces that can destroy your wealth if you are withdrawing income from your investment portfolio: the dollar-cost-averaging and the inflation as applied to market volatility and market cycles.

A third sinister force for the snowbirds is the chronic falling value of the Canadian dollar. It is outside the scope of this article. It can be easily handled in a properly designed investment portfolio.

The fourth sinister force is the unforeseeable need for lump-sum cash, such as during a prolonged illness or for long-term care. In many cases, these can be handled with appropriate insurance.

My retirement spreadsheet model that incorporates the market cycles is still available for the Canadian MoneySaver readers. It includes an adjustable random volatility generator to show the effects of routine fluctuations. You can plug in your own numbers and see how these factors can influence your retirement assets. You can include periodic withdrawals and/or lump-sum withdrawals and deposits. Send me an e-mail: cotar@home.com

If you choose to ignore the last one hundred years of history, perhaps thinking, "this time it is different", I wish you best of luck. You'll need it.

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Figure 1: Portfolio Value, Comparing Standard Retirement Plan (8% growth, 3.5% inflation per year) to retiring in the beginning of 1929,1933 and 1966. Starting with 1 million dollars, withdrawing \$60,000 per year adjusted for inflation

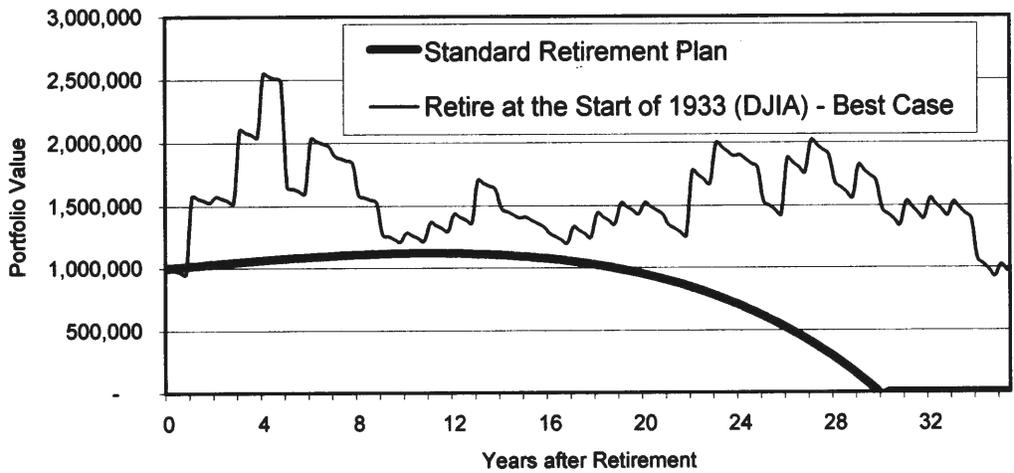
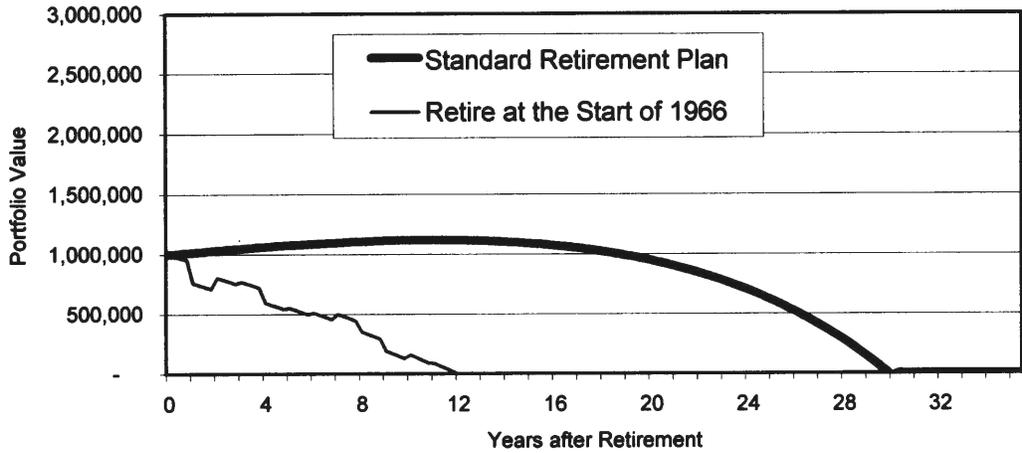
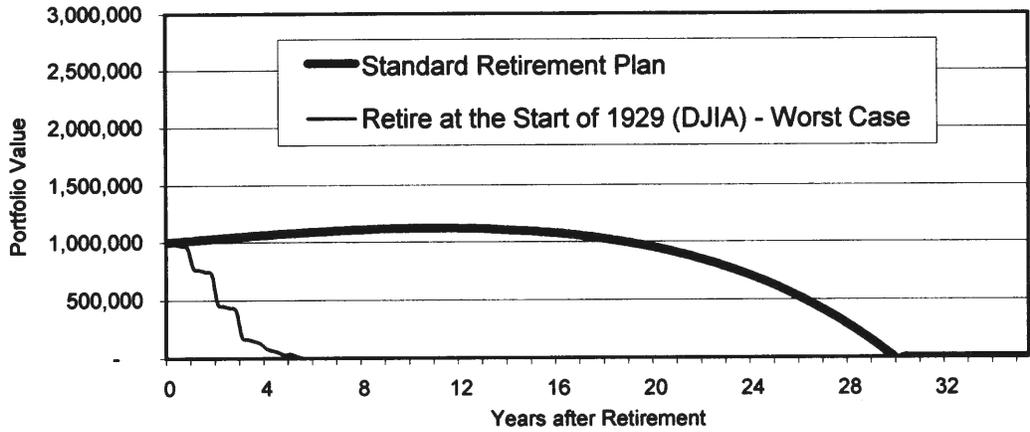


Figure 2: The Probability of Portfolio Values at different withdrawal rates during the last one hundred years of stock market history.

Portfolio Value:

- None
- ▨ \$1 to \$1 million
- ▧ \$1 million to \$2 million
- \$2 million or more

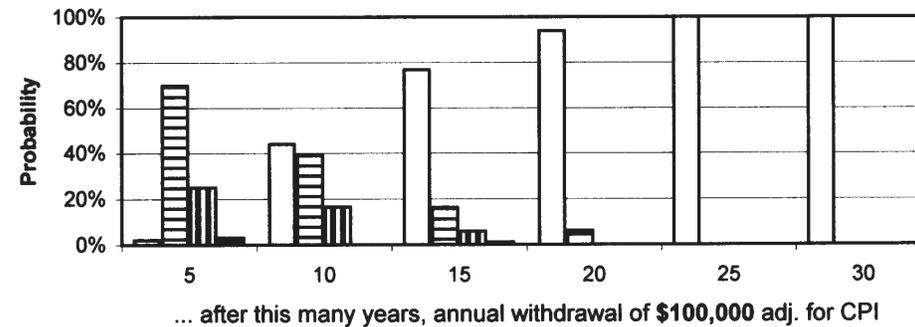
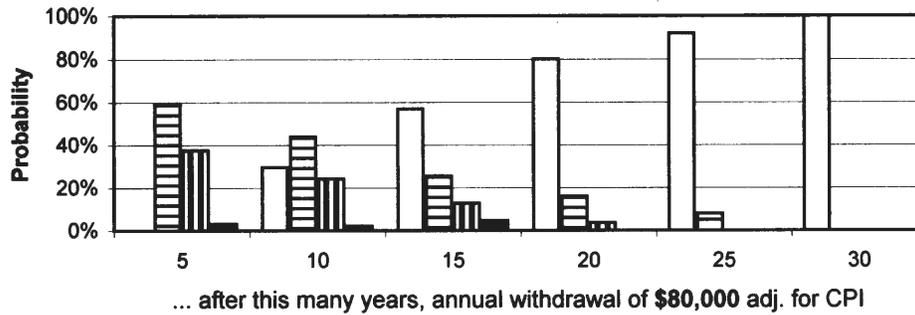
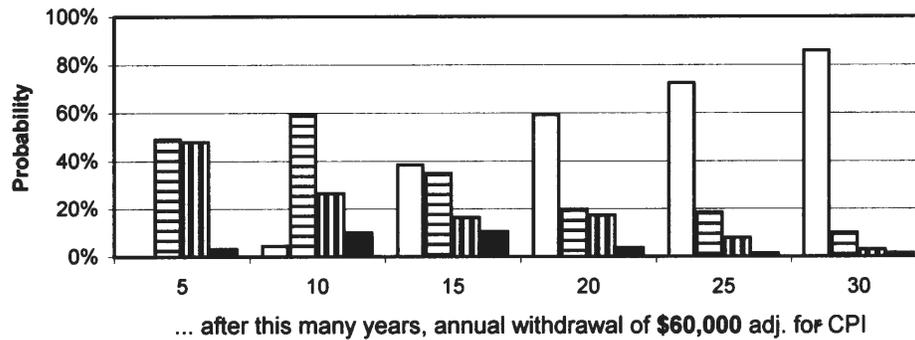
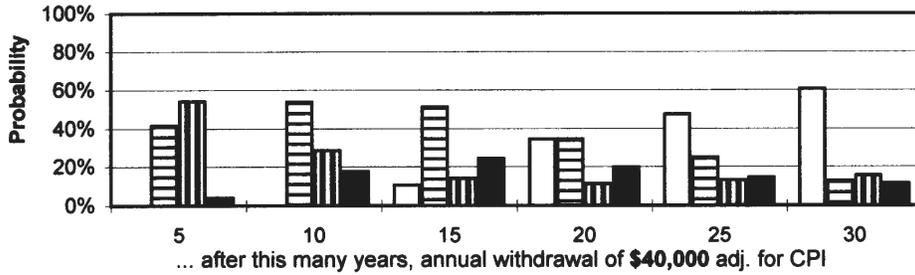


Figure 3: Comparison of a Standard Retirement Plan Projection with actual stock market performance. Starting with 1 million dollars, withdrawing \$60,000 per year adjusted for inflation

