

Picking a Rate of Return to Use for Long-Term Planning

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Article Highlights

- Basing assumptions on the highest historical returns carries a high likelihood of falling short of one's goal, while using the worst-case returns can lead to an unrealistic savings requirement.
- Since 1940, large-cap stocks have only experienced one decade with negative nominal returns (–1.0% between 2000 and 2009).
- Small-cap stocks are true inflation fighters, realizing a return of 9.2% since 1926 and never experiencing a “lost decade” since the Great Depression.

Those saving for retirement always face the uncertainty of future returns.

A period of good returns can significantly increase the size of one's retirement account balances. A period of bad returns can limit wealth and potentially force a person (or couple) to rethink what retirement will look like.

There are levers individual investors can pull during their working years. The biggest is savings. Saving early in one's career and consistently increasing the amount set aside will have a significant and lasting impact on long-term wealth. Two other big levers are allocation and the ability to stick with a long-term plan.

When forming or revisiting a strategy for retirement savings or other long-term savings, long-term returns for the major asset classes can provide guidance. Long-term return data can also provide the confidence needed to stick with a strategy when the financial markets experience bouts of turbulence.

A Case Study: Revisiting the Maples

In 1997, we published a case study about a fictional couple—Joe and Lisa Maple—who were facing the challenge of saving for retirement (“Planning Assumptions: Will the Real Long-Term Return Please Stand Up?,” November 1997).



The couple, as described by former *AII* Journal editor Maria Crawford Scott, were in their late 30s and had recently decided to become more serious about saving for retirement. In this update, we'll use the Maples again (without aging them) to provide a practical example of how to use historical return data to form a long-term plan.

Joe and Lisa have about \$50,000 in savings from their employer-sponsored retirement plans. They have no real need for income from their investments—they have no children, and both are working. All of their savings are invested in stock mutual funds, primarily a large-cap index fund.

However, they're cautious about solely being allocated to a single asset class and are thinking about diversifying. They've heard bonds described as being less volatile than stocks and are considering adjusting their portfolio to include a bond fund. The Maples have set a tentative goal of building their savings to about \$2 million by the time they retire, in approximately 30 years. To determine if their goal is reachable, they want to form an idea of what type of return they can reasonably expect.

Joe and Lisa have seen return forecasts discussed in the media, online and by their friends. They are leery of using these forecasts given how far off retirement will be. The Maples also acknowledge their own inability to forecast future returns. After some conversation, Joe and Lisa decide one

approach may be to base their expectations on how stocks and bonds have performed historically.

After doing a bit of research at their local library, they come across the Ibbotson SBBI Yearbook (Duff & Phelps, 2017). In it, they find return data covering a longer period than they expected. It's good information, but when they start running some numbers, they find, to their dismay, returns differ depending on what period they use. [Note: We had yet to receive the 2018 SBBI Yearbook as of press time.]

- First, Joe and Lisa look at the full 91 years of return data (1926–2016). These numbers show large-cap stocks having a 10.0% annualized return and small-cap stocks having a 12.1% return. They also observe long-term government bonds as having a 5.5% annualized return and intermediate-term bonds having a 5.1% return.
- Then they find a table showing return statistics for a more recent 45-year period (1972–2016). Large-cap stocks realized a 10.4% annualized return, while small-cap stocks gained 13.3%. Long-term government bonds gained 8.2% and intermediate-term bonds gained 7.0%.
- Taking their age into consideration, the couple decides to see what the returns have been like for the last 30 years. Based on the data, they calculate large-cap stocks as gaining 10.2%, small-cap stocks up 11.3%, long-term bonds returning 7.9% and intermediate-term bonds gaining 5.8% on annualized basis.

The variance in returns for the large-cap stocks may seem small, but the Maples will be investing over a long period of time—at least another 30 years. A difference of even just under half of a percentage point in realized return can have a substantial difference in ending wealth.

For instance, if Joe and Lisa kept their entire \$50,000 savings invested in a large-cap index fund over a 30-year time period and earned a historical rate of return, they would end up with:

- \$872,000 assuming a 10.0% annual return,
- \$921,000 assuming a 10.2% annual return, or
- \$973,000 assuming a 10.4% annual return.

As you can see, the difference between the best and worst outcome is approximately \$100,000. If their goal is to retire with \$2 million, they would need to adjust their year-end contributions to their retirement accounts for each assumed rate of return as follows:

- \$6,855 annually if they assume a 10.0% annual return,
- \$6,314 annually if they assume a 10.2% annual return, or
- \$5,788 annually if they assume a 10.4% annual return.

These differences assume no change in their portfolio allocation. If they add small-cap stocks to their portfolio, they could either reach their goal sooner with the same amount of savings or contribute less each year. If they add bonds instead, they would either have to postpone retirement or increase their savings rates further.

Best- and Worst-Case Scenarios

Since they graduated college in the aftermath of the early 2000s recession and Joe experienced a lay off during the Great Recession of 2007–2009, the Maples decide to run the numbers on what they've heard described as the "lost decade." They calculate the returns for large-company stocks as –1.0% over the period 2000–2009. They also notice that small-company stocks performed better, gaining 6.3% over the same period of time, and long-term and intermediate-term government bonds realized gains of 7.7% and 6.2% during the same decade.

This analysis prompts Joe and Lisa to wonder how potentially good or bad returns could be over a longer period. The Ibbotson SBBI Yearbook does not provide the data on 30-year periods, but does give the information on 20-year returns. While not a perfect fit, the Maples decide this data can be used to establish expectations for what

might happen over the course of their careers. According to Ibbotson:

- Large-company stocks have realized a 20-year annualized return as high as 17.9% (1980–1999) and as low as 3.1% (1929–1948),
- Small-company stocks have realized a 20-year annualized return as high as 21.1% (1942–1961) and as low as 5.7% (1929–1948),
- Long-term government bonds have realized a 20-year annualized return as high as 12.1% (1982–2001) and as low as 0.7% (1950–1969), and
- Intermediate-term government bonds have realized a 20-year annualized return as high as 10.0% (1981–2000) and as low as 1.6% (1940–1959).

The difference between the best-case and worst-case scenarios are large. If they only stayed allocated to large-company stocks, they wouldn't have to contribute anything to their savings if the best-case scenario were to occur. In fact, they would reach their goal seven years earlier than planned. A repeat of the worst-case scenario, however, would require annual savings of nearly \$38,778—an amount unrealistic for the majority of people.

The problem with best and worst returns is the low likelihood of them recurring over a given period. The worst 20-year period performance for large- and small-company stocks occurred during the Great Depression and World War II. Even the "worst decade" for large-cap stocks occurred during a 10-year period when there were two recessions, two bear markets and the worst financial crisis the U.S. has seen since the Great Depression.

The best 20-year return period benefited from a big technological revolution, first with personal computers and then with the internet. While it resulted in highly favorable returns, depending on a repeat of such a great performance for stocks carries a high likelihood of falling short of one's savings goals. While the Maples might like to benefit from such high returns, they should save as if this scenario will not repeat.

Not mentioned in any of these

numbers is volatility. Stocks experience big fluctuations in their returns, both up and down. When a specific period is cherry-picked, it's easy to justify an investment return. Add in the human tendency to seek out data confirming their beliefs and the chance increases of making the wrong assumption about the returns to expect.

Being Judgmental

Stock returns are affected by expectations concerning future growth in earnings; for the market as a whole that translates into expectations concerning the growth of the U.S. economy. Fixed-income returns are affected by expectations concerning inflation, which is affected by economic conditions, but also by Federal Reserve policies. Stocks tend to produce higher rates of return than bonds both before and after inflation, but during periods of high inflation, both stocks and fixed income will suffer.

Table 1 shows rates of returns for stocks and bonds by decade since the 1940s, as well as partial returns for the current decade through 2016.

Despite everything that has happened over this 76-year period, decade-long returns were only negative once for large-cap stocks: in the 2000s because of the aforementioned recessions and financial crisis. Returns were also low, but still positive on an absolute basis, for large-cap stocks during the 1970s when inflation hit double-digits. On the other hand, annualized gains were well into the double-digits on a percentage basis during three of the seven full decades.

Notably, the 2000s were not a lost decade for small-cap stocks. Though

Table 1. Historical Nominal Returns by Decade

The returns below show how each asset class has performed on a nominal (absolute) basis on a decade-by-decade basis. Long-term returns (1926 through 2016) are also listed to provide a comparison.

Decade	Large-Cap Stocks	Small-Cap Stocks	Long-Tm Gov't Bonds	Interm-Tm Gov't Bonds	Inflation
1940–1949	9.2%	20.7%	3.2%	1.8%	5.4%
1950–1959	19.4%	16.9%	(0.1%)	1.3%	2.2%
1960–1969	7.8%	15.5%	1.4%	3.5%	2.5%
1970–1979	5.9%	11.5%	5.5%	7.0%	7.4%
1980–1989	17.6%	15.8%	12.6%	11.9%	5.1%
1990–1999	18.2%	15.1%	8.8%	7.2%	2.9%
2000–2009	(1.0%)	6.3%	7.7%	6.2%	2.5%
2010–2016*	12.8%	15.3%	6.9%	2.9%	1.6%
Long-Term	10.0%	12.1%	5.5%	5.1%	2.9%

*Three years short of a decade.

Table 2. Historical Real Returns by Decade

The returns below show how each asset has performed after being adjusted for inflation on a decade-by-decade basis. An investment can have a positive nominal (absolute) return, but a negative real (inflation-adjusted) return if it appreciates at a slower pace than inflation increases over the same period, as was the case for large-cap stocks between 1970 and 1979.

Decade	Large-Cap Stocks	Small-Cap Stocks	Long-Tm Gov't Bonds	Interm-Tm Gov't Bonds	Inflation
1940–1949	3.6%	14.5%	(2.1%)	(3.4%)	5.4%
1950–1959	16.8%	14.4%	(2.2%)	(0.8%)	2.2%
1960–1969	5.2%	12.7%	(1.0%)	0.9%	2.5%
1970–1979	(1.4%)	3.8%	(1.7%)	(0.4%)	7.4%
1980–1989	11.9%	10.2%	7.2%	6.5%	5.1%
1990–1999	14.8%	11.8%	5.7%	4.2%	2.9%
2000–2009	(3.4%)	3.7%	5.0%	3.6%	2.5%
2010–2016*	11.0%	13.5%	5.2%	1.2%	1.6%
Long-Term	6.9%	9.0%	2.6%	2.2%	2.9%

*Three years short of a decade.

their returns were the lowest of any decade since the Great Depression, small-cap stocks still realized an annualized return of 6.3% between 2000 and 2009. Small-cap stocks have not routinely outperformed their large counterparts, however—trailing in three different decades (1950–1959, 1980–1989 and 1990–1999).

Table 1 also shows returns for both

long-term and intermediate-term bonds. Though the 1970s were associated with poor returns for bond prices, their high yields provided much more income on a nominal (absolute) basis. Long-term bonds only incurred negative nominal returns during the 1950s when inflation was dormant and the economy was enjoying a postwar boom. Falling interest rates in the 1980s led to a multi-decade period of high returns for long-term and intermediate-term bonds.

The returns for each decade can be attributed to some event (or series), such as the 1950s postwar prosperity, the 1970s high inflation and oil embargos, the tech-driven boom of the 1990s and the dual-recession of the 2000s. Unless a person is absolutely certain about a specific set of circumstances recurring, basing future return expectations on a single decade or another comparatively shorter period of time should be avoided. Even if a person feels confident about their forecast, a very large margin of error should still be factored in.

Adjusting for Inflation

Table 2 adjusts the historical nominal (absolute) returns for inflation. The real (inflation-adjusted) returns shown in this table reflect what an investor would have realized after inflation has been factored in. The formula for calculating real return is $[(1 + \text{nominal return}) \div (1 + \text{inflation})] - 1$. As you can see in Table 2, the real returns are lower across the board for both stocks and bonds.

Even with the adjustments, large-cap stocks still have a favorable record of performance relative to long-term bonds. Real returns for large-cap stocks

have only underperformed long-term bonds during one decade since 1940: the lost decade of 2000 through 2009. This period was not only marked by two bear markets for stocks, but also by falling inflation and yields.

University of Pennsylvania finance professor Jeremy Siegel points to real returns when making the case for stocks being the best investment over the long term. In a 2014 interview, he told AAIL, “Over time, stocks are good hedges against inflation, so they keep up with inflation and purchasing power ... After inflation, stocks are less risky than government bonds for holding periods of two decades or more.” (See “Real Returns Favor Holding Stocks” in the August 2014 *AAIL Journal* for the full interview.)

The data supports his view. Between 1926 and 2016, large-cap stocks have rewarded investors with real annualized returns of 6.9%. In comparison, the real annualized returns for long-term government bonds and intermediate-term government bonds are 2.6% and 2.2%, respectively.

Small-cap stocks are the true inflation fighters. Their real return since 1926 is 9.0%. Furthermore, as Table 2 shows, since 1940, small-cap stocks have never had a single decade where their real returns were negative. This asset class has beaten inflation for six decades and is on track to do it again for a seventh decade.

Using the Return Data in an Investment Plan

After reviewing this data, Joe and Lisa feel more confident and empowered. They feel they have a better grasp of how stocks and bonds have historically performed. They also now recognize the danger of looking at shorter periods of time and extrapolating those returns into expectations of what might happen in the future.

The Maples also have a better understanding of the relative performance of stocks versus bonds. While they were previously aware of the volatility of stocks, they now recognize

the importance of maintaining a large allocation to stocks given their 30-year investment time horizon. They do acknowledge that staying solely allocated to large-cap stocks is hurting their portfolio’s growth potential, given the historical outperformance of small-cap stocks. They make a plan to adjust their allocation.

Regarding bonds, Joe and Lisa recognize that a significant allocation to either long-term or intermediate-term bonds will leave them short of their retirement goals. Should returns be close to or below the long-term annualized returns, the Maples will not be able to make up the shortfall with savings.

The Maples previously recognized the role bonds can play as a diversification tool in buffering a portfolio against downside volatility in stocks. Their analysis convinces them that the relatively small return difference favors intermediate-term bonds over long-term bonds. They agree to consider bonds as they get closer to retirement, but not now given their lengthy investment horizon.

Joe and Lisa find that the greatest benefit of the historical analysis is the ability to ignore the shorter-term forecasts made by pundits and strategists. While the Maples expect stocks to fluctuate in price, they find that the long-term data and even the decade-by-decade analysis make a strong argument for thinking long term. While the future may turn out different than they expect, the Maples are convinced that any strategy based on shorter-term forecasts may be even more prone to error. Rather than take this chance, Joe and Lisa agree

Calculating the Real Return

The real return is the return realized after adjusting for the impact of inflation. As long as prices rise over a given a period, the real return will always be less than the nominal (absolute) return. The formula for calculating the real return is:

$$\text{Real Return} = \frac{(1 + \text{Return})}{(1 + \text{Inflation})} - 1$$

Here is a brief example of how the real return formula works. Assume the rate of return is 10.0% and the rate of inflation is 2.9%. Convert both numbers to decimals and plug them into the formula:

$$\text{Real Return} = \frac{(1 + 0.10)}{(1 + 0.029)} - 1$$

$$\text{Real Return} = (1.1 \div 1.029) - 1$$

$$\text{Real Return} = 6.9\%$$

to save in excess of what the average returns suggest they should, but not so much that they are sacrificing their other financial needs—including having adequate short-term savings.

What’s the Right Return?

Which long-term rate of return is the “right” long-term rate of return? The data will always be dependent on the starting and ending dates used for the analysis. The longer-term data does tend to support using the nominal return of approximately 10% for large-cap stocks and 12% for small-cap stocks.

For planning assumptions, however, bond returns are harder to assess because of the three-decade upward run they experienced since the 1980s. A period of below-average nominal returns going forward would not be unexpected. Even still, based on the historical data, the odds of bonds incurring long-term negative returns on an absolute basis appear low.

Whether actual future returns will be equal to, above or below their long-term

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inherently or intuitively. When dealing with retirement security in particular, more than a casual acquaintance with investing is required. Sound decision-making needs to be based on cash flow management in good markets and bad. It also demands an appreciation of the effect of inflation with the passage

of time, and the integration of estate, financial and tax planning.

Notwithstanding the apparent complexities, the future can and will be sound and secure for investors who embrace this basic principle: Bull markets are followed by bear markets, and bear markets are followed by bull markets.

That may seem trite, but the point is that no market is bound heavenward at all times. Historical perspective will give you a foundation to build your investment decisions on, especially if you have a long investment horizon. Achieving retirement security is a long-term enterprise. ▲

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savings rate will have to increase.

Conclusion

The most important thing that can be done right now to help America's population be better financially prepared for retirement would be to increase

the annual savings rate to at least 6% of annual income. An annual savings rate of 10% would be the long-term goal. A savings rate of 10% or higher is particularly important for investors over the age of 45.

This may seem very discouraging to someone who is doing their best to

set aside 4% to 5% of income each year into their retirement portfolio. Don't be discouraged. If 4% is your best effort right now, take courage in that. However, work toward a 6% savings rate or higher—with 10% being the ideal goal. As with many goals, we have to work our way there over time. ▲

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averages cannot be known in advance. For individual investors, what really matters is attaining personal financial goals. To do this, the goal needs to be based on return expectations that are within reach, not on wishful thinking or crystal ball projections.

Long-term historical returns serve as a useful guide, but they need to be tempered with judgment:

- Make sure your expectations are not based on historical returns that are heavily weighted by short-term economic environments that are unlikely to be sustained during your investment horizon.
- Make sure that your return assumptions include relationships that are consistent with past long-term relationships.
- Be aware of the limitations—no one can predict the future with any degree of accuracy, so make sure your plans are conservative, flexible and don't depend on pinpoint accuracy.
- Finally, realize that while you have no influence over future returns, you do have control over your ability to save relative to your level of income and invest in a disciplined manner. ▲

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