Q&A with IFA: Are Monthly Stock Market Returns Normally Distributed?

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Updated: Tuesday, July 2, 2019
Originally Published: Monday, June 2, 2014

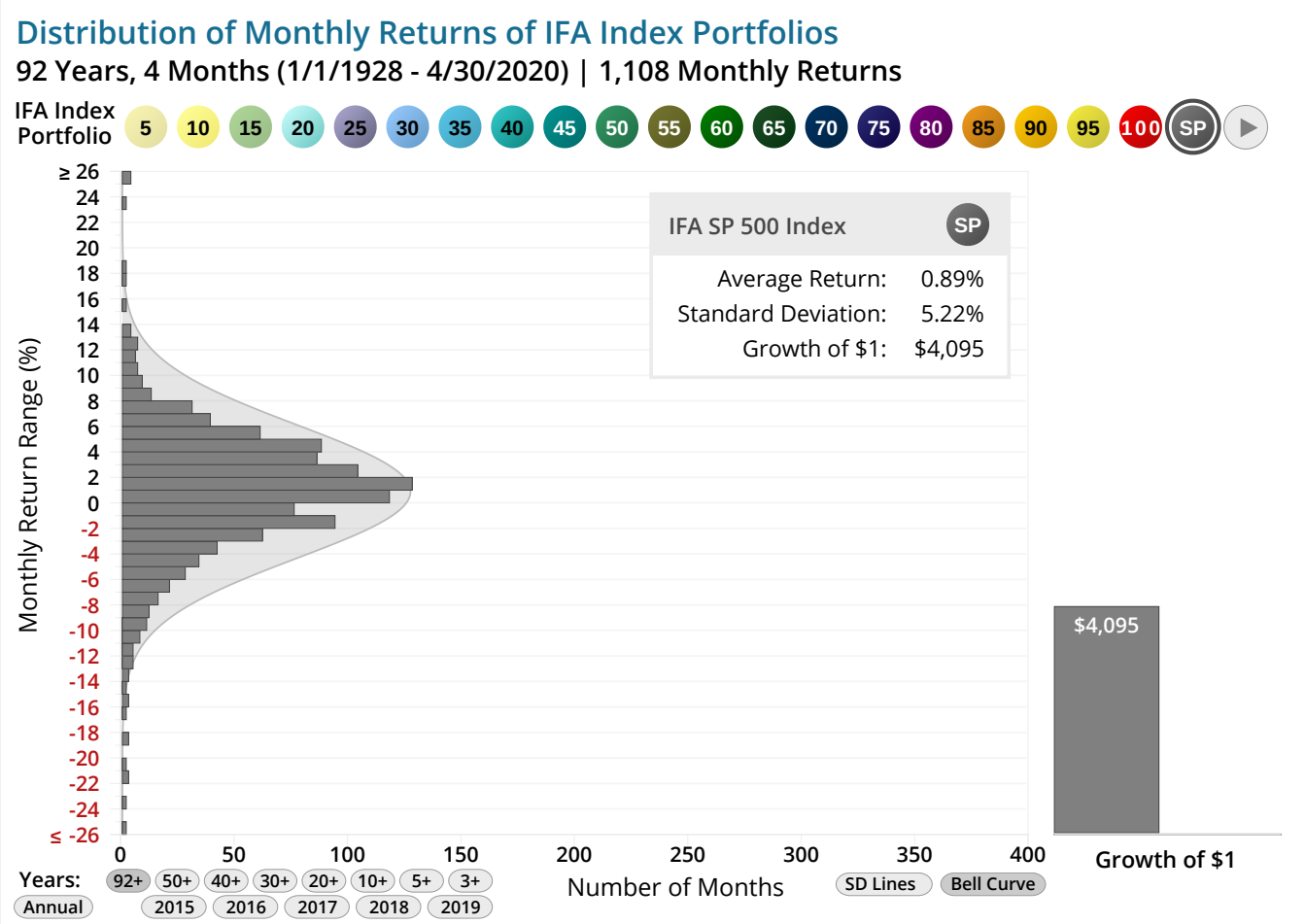
In the course of talking to investors about their portfolios, a key issue that our advisors face revolves around answering the question, "What is the best way to describe the distribution of stock returns — a normal distribution, lognormal or something else?" This often leads to a follow up discussion concerning another important take away: "What should investors actually do with this information?"

To answer such significant questions, we've taken the answers of two well-known financial scholars -- Eugene Fama and Kenneth French -- from a past piece on DFA's Fama/French Forum where they tackled these types of issues. In a type of questions-and-answers format, here are some important highlights and points we've gleaned from their writings:

"Distributions of daily and monthly stock returns are rather symmetric about their means, but the tails are fatter (i.e., there are more outliers) than would be expected with normal distributions. (This topic takes up half of Gene's [Fama's] 1964 PhD thesis.) In the old literature on this issue, the popular alternatives to the normal distributions were non-normal symmetric stable

distributions (which are fat-tailed relative to the normal) and t-distributions with low degrees of freedom (which are also fat-tailed). The message for investors is: expect extreme returns, negative as well as positive."

We would elaborate on their response by noting that the normal distribution is relevant for monthly returns over the last 50 years, as seen in the chart below. Click the buttons along to the top to see different portfolios, buttons in bottom left corner for different time periods and buttons in the bottom right corner to display standard deviation lines.



For HYPOTHETICAL back-tested performance data shown in this chart, see ifabt.com. IFA Index Portfolios are labeled with numbers that refer to the percentage of stock indexes in the asset allocation, as opposed to the allocation of bond indexes. For example, an IFA Index Portfolio 90 is 90% IFA stock indexes and 10% IFA bond indexes. For more, go to indexdescriptions.com. The HYPOTHETICAL back-tested performance of the IFA Index Portfolios was achieved with the benefit of hindsight; it does not represent actual investment strategies for the entire period; and it does not reflect the impact that economic and market factors may have had on the advisor's decision making if the advisor were actually managing client money during the period shown. The performance of index portfolios does reflect the maximum annual advisory fee of 0.9%. IFA Index Portfolios do reflect the deduction of mutual fund fees, include reinvestment of dividends, capital gains, and includes the deduction of IFA advisory fees, but does not include transaction costs or taxes, which if included, would lower performance. The IFA Index Portfolios were created by IFA in 2000. Past performance does not guarantee future results. Performance figures may contain both live and HYPOTHETICAL back-tested data. All data, including performance data, is provided for illustrative purposes only, it does not represent actual performance of any client portfolio or account and it should not be interpreted as an indication of such performance. IFA utilizes "standard deviation" as a quantification of risk, see the definition of "standard deviation" in the IFA glossary.

In a normal distribution, 99.7% of the data points should fall within three standard deviations from the mean. Let's take, for example, a globally diversified all-stock portfolio like Index Portfolio 100. For illustrative purposes, suppose only seven monthly returns (about 1%) over the last 50 years fell beyond three standard deviations from the mean -- i.e., between 15% and -13% in a month.

Then let's say the other IFA Index Portfolios showed similar, or even more normal, results. Next, let's click in the chart's bottom left corner and extend the data back to 1928. Again, hypothetically, say this indicates that 1.7% of the monthly returns are beyond the three standard deviations.

On yearly returns, even extreme years such as 2008 (when the S&P 500 dropped by 37%) can be readily explained by a normal distribution. (In case you were wondering, 2008 was about a 2.5 standard deviation event that could happen about once in 80 years.)

As for what investors should do with this information, we could not agree more with the statement by Fama and French that investors should expect extreme returns, with negative and positive returns having equal probabilities from every fair price. But the main lesson from recognizing that monthly returns are random and normally distributed is to not try to time the market.
