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Long-run stock returns

How much does the stock market return? That the market goes up over the long haul might seem like the easiest concept in the world to grasp, but it was an idea long in the making.

Both traders and investors need to understand the distinct personalities of every type of market they trade. The stock market's chief characteristic has been a relentless long-term upward bias, as evidenced by the 1.5 million percent returned by a random selection of U.S. stocks over the 20th century.

The implications of this bias are monumental, including the guarantee a large short position in equities held long enough will ruin even the wealthiest person. Accordingly, when trading, we recommend shorting equities only for brief periods and with positions that are one-quarter or one-eighth the size of long positions. For investors, a fairly steady accumulation of equities over time is a sound policy. Although it is now commonly accepted that stocks outperform other investments in the long run, this idea was not always held in such high esteem. How academics and investors came to these views about long-run returns is an interesting story.

First steps

The first credible attempt to empirically estimate the long-term return on stocks was made by Edgar Lawrence Smith in his 1926 book *Common Stocks as Long Term Investments*. Collecting data by hand for the most actively traded stocks from 1901 to 1922, Smith showed that an investor who simply held stocks (absent any market timing or stock selection ability) over this period would have outperformed a bond investor.

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His findings were at odds with conventional wisdom, which regarded stock investing as a treacherous field in which only the well-informed, well-connected or lucky made money from in-and-out trading — at the expense of the less-fortunate masses. Serious long-term investors preferred bonds.

Three years after his book's publication, the bottom fell out of the stock market and Mr. Smith fell out of favor. None other than Benjamin Graham (the so-called father of "value investing" frequently cited by Warren Buffet) blamed Smith's book for inspiring an orgy of uncontrolled speculation that led directly to the 1929 market crash.

However, regarding the fundamental point of long-term stock and bond returns there is no doubt who was right. According to Ibbotson Associates, from 1926 to 2001 stocks returned 10.9 percent a year while bonds returned 5.8 percent.

Nonetheless, Buffett still claims Smith's book was a dangerous one; knowledge of investing is best left to the experts and should be hidden from ordinary people.

Corroborating evidence

Mr. Smith did a good job for an amateur (he analyzed price changes only, which makes his figures difficult to compare to later studies), but Professor Will Goetzmann of Yale University reminded us of a more formidable work in a recent correspondence.

"The most carefully crafted empirical study of the long-term performance of the stock market was *Common Stock Indices*, by Alfred Cowles III and published in 1938," he writes. "Cowles collected individual NYSE stock prices — actually, monthly highs and lows — and dividends from 1872 to 1937, [making it possible to] analyze total return to equity investing."

"Total return" means the sum of price changes and dividends, and is now the accepted way of reckoning returns in the stock market. Like Smith, Cowles documented dramatically positive long-term equity performance.

The data collectors

The next step forward occurred in 1964 when Lawrence Fisher and James Lorie published "Rates of Return on Investments in Common Stock" in the *Journal of Business*. The article was based on the first computerized database of stock prices recently completed at the University of Chicago's Center for Research in Security Prices (CRSP). The history of science is full of examples of monumental data collections that sparked revolutions in knowledge. Tycho Brahe's careful measurements of planetary positions led to Johann Kepler's laws on the motion of the planets. The plant data compiled by Carl Linnaeus in the early 18th century provided the base for Charles Darwin's evolutionary discoveries. Henry Cavendish's and Antoine Lavoisier's painstakingly detailed measurements of the various chemical elements led to Dimitri Mendeleyev's creation of the periodic table of elements.

The development of the CRSP (pronounced "crisp") database played a similar role in bringing security analysis into the modern era. Hypotheses on portfolio analysis, market efficiency, behavioral finance or price reactions to events could now be tested empirically. The discoveries resulting directly from this data collection have been rewarded with numerous Nobel

prizes. Fisher and Lorie showed the total return from a *random* investment in NYSE stocks from 1926 to 1964 was 9.1 percent a year. Like before, there was some surprise in certain circles the figure could be so high. Stock analysts derided the idea of investing "randomly" and felt a conspiracy was afoot to downplay the value of their advice.

Like Smith's work, however, Fisher and Lorie's article came down the pike at exactly the wrong time for investors. Four years after publication, when everyone was familiar with the Fisher and Lorie study (the Ford Foundation had even used it to urge an increase in endowment funds' exposure to stocks), the market peaked. Many disgruntled investors and market professionals essentially accused Fisher and Lorie of promising stocks would *always* go up 9.1 percent each year, which, of course, they hadn't.

Another study in the 1970s added to the growing body of evidence regarding long-term stock returns.

"It is also worth mentioning the 1976 Ibbotson-Brinson studies published in the *Journal of Business*," writes Professor Goetzmann "They made a very bullish forecast for the next 20 years. It was an early application of the simulation approach to forecasting the market — and it turned out to be right on, despite the nay-saying tone of equity investors in the mid-1970s. Fisher and Lorie published an important academic work, but Ibbotson really popularized the equity premium among investment managers."

(Note: Ibbotson also publishes an annually updated study called "Stocks, Bonds and Inflation 1926 to Present.")

The modern era

To further refine the estimates of stock returns requires large amounts (i.e., decades) of fresh data. Unfortunately such data is hard to come by. For the U.S. market, the Cowles Index goes back to 1872. Special research efforts have required even more distant data. Goetzmann, Roger Ibbotson and Liang Peng collected U.S. stock market data by hand from 1816 when the first official NYSE list became available. This produced a clean, brand-new index.

Their study, "ANew Historical Database for the NYSE 1815 to 1871: Performance and Predictability," in T*he Journal of Financial Markets* (2001) documented a substantial equity premium for the U.S. over history. The analysis is based — for the first time — on hand-collected individual security price data and hand-collected dividend data. This data, which took 10 years to collect, is available at www.icf.yale.edu.

Using data for the United States, Jeremy Siegel (*Stocks for the Long Run*, 1994, 2002) concluded the long-term rate of return for stocks was 6.75 percent after inflation, or 8.75 to 9.75 percent, assuming 2- to 3-percent inflation. Let's consider the degree of uncertainty associated with this number. With 167 years of data, and assuming an annual standard deviation of 20 percent, the standard error of the mean (which is a statistical measure of uncertainty) is 1.5 percent. A 95-percent confidence band, that is an interval which contains the true value with 95% probability, would put Siegel's estimate of U.S. stocks' real return as "3.75 percent to 9.75 percent." That is quite a large range.

Going global

To refine our estimate we have to look at markets outside the United States. Phillipe Jorion and Goetzmann pioneered this so called cross-sectional approach in their article "Global Stock Markets in the Twentieth Century" (1999, Journal of Finance). They studied a large number of markets around the world beginning in 1921 and came to three conclusions: First, the U.S. was the leader in real stock price appreciation over this period. Second, many markets fared very poorly, particularly South American and Central European exchanges. Third, a GDP-weighted index of world markets performed nearly as well as that of the U.S., suggesting that although the U.S. experience gives us a rosy picture of stock market performance, the world equity market also yielded a significant equity premium (as measured over inflation).

Our favorite book on global stock market performance is Elroy Dimson, Paul Marsh and Mike Staunton's *Triumph of the Optimists* (2002, Princeton University Press). It studies 16 equity markets from 1900 to 2000. Once again the reward for the long-term stock investor is found to be quite satisfactory, with rates of return similar to those in the United States. (The U.S. did perhaps a little better than the others, but three markets did even better than the U.S.) Within *Triumph's* pages, readers can find definitive information on inflation-adjusted returns for stocks, bonds and treasury bills, real dividends, correlation between markets worldwide, and the relative performance of value and growth stocks. Their work epitomizes outstanding investment research. Unlike most books written by academics, *Triumph* avoids hasty generalizations and flawed sampling procedures. The authors rightly fault earlier investment studies for arbitrary selection of starting and stopping points, the tendency to include the good and exclude the bad, and a parochial focusing on a small slice of the global picture.

Great works can be created in humble circumstances. Shakespeare was an actor and entrepreneur who reworked old plots so his theater company could make a buck. Cervantes wrote *Don Quixote* to repay his debts. Dimson told us he and his colleagues thought of *Triumph* as "…a labor of love — just a small contribution that could lead to a paperback meant for light reading on planes." (He quickly added, "Our families would be less kind about our fixation.") Staunton, who collected the data, prefers to gather statistics by himself from original sources at specialized libraries instead of delegating the work. The main conclusion of *Triumph* is that a random selection of U.S. stocks returned 1.5 million percent in the 20th century. Yes, big losses occurred at times, such as the back-to-back losses of -28 percent and -44 percent in 1930 and 1931, or the 10 years from 1970 to 1979 when stocks barely budged while the dollar lost 28 percent of its purchasing power. But overall, adjusted for inflation, the return on U.S. stocks amounted to 6.3 percent a year, better than any other class of securities.

Current studies

Unless intelligent life is discovered on another planet and a stock market is found to have been operating there for some centuries, it is unlikely that much new data can be brought to bear on the issue of long-run stock returns. *Triumph of the Optimists* may well be the last word on the subject for some time to come. Nevertheless, we try to keep in touch with the literature and have recently reviewed five published papers (including the latest work from the authors of *Triumph of the Optimists*). You can read these papers, and our analysis, at www.dailyspeculations.com.

We appreciate Professor Goetzmann's input for this article.

For information on the authors see p. 10.