Jill Mislinski, *advisorperpectives.com*, January 2021

The Q Ratio and Market Valuation: December Update

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The Q Ratio is a popular method of estimating the fair value of the stock market developed by Nobel Laureate James Tobin. It's a fairly simple concept, but laborious to calculate. The Q Ratio is the total price of the market divided by the replacement cost of all its companies. Fortunately, the government does the work of accumulating the data for the calculation. The numbers are supplied in the Federal Reserve Z.1 Financial Accounts of the United States, which is released quarterly.

The Q2 2019 release had significant revisions. Here is an explanation from the Fed:

> *"The upward revision to liabilities on the corporate balance sheet brings the U.S. Financial Accounts into closer alignment with the international standards in the System of National Accounts 2008. Because the revised measure of liabilities represents a broader definition than is typically assumed on corporate balance sheets, we have adjusted the debt- and equity-to-net worth ratios shown on table B.103 (lines 43 and 45) to exclude the equity portion of FDI."*
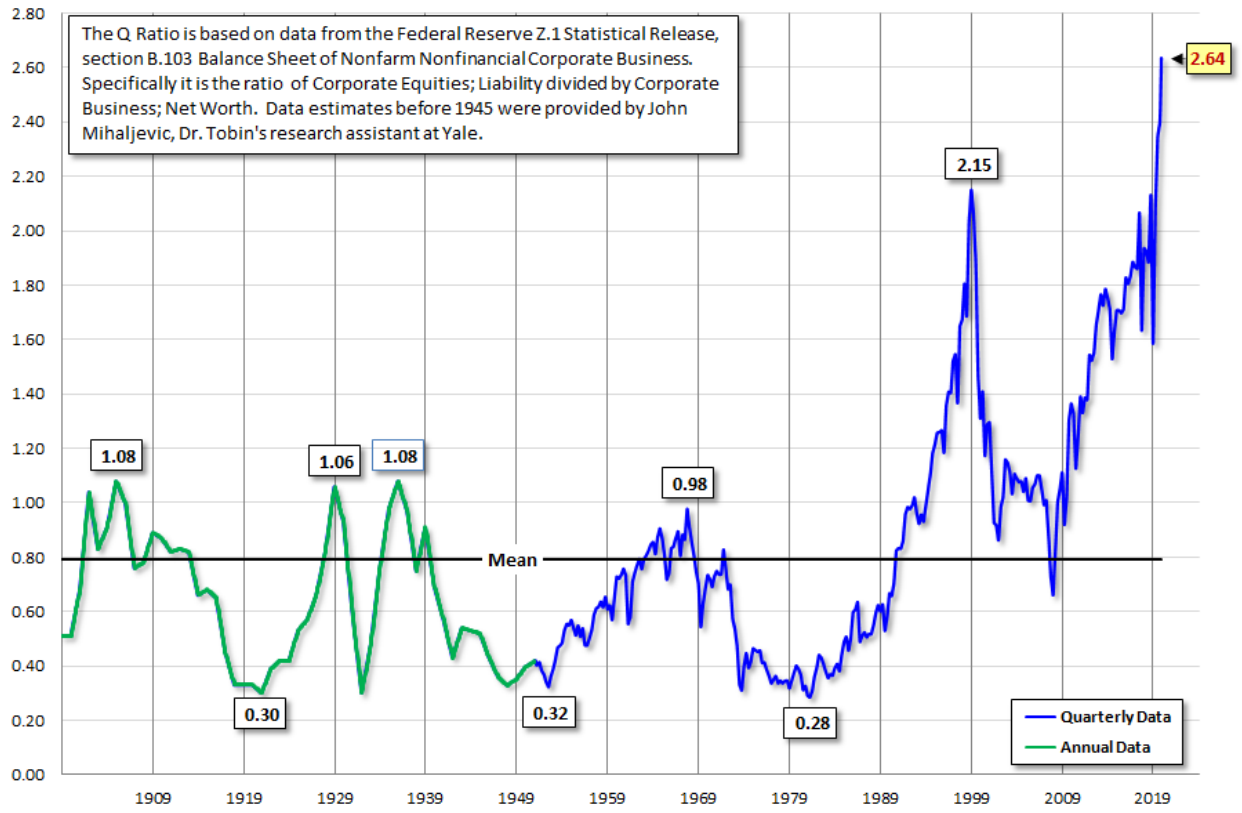>
> You can read more regarding these revisions here by clicking on **"Why did the net worth of the nonfinancial corporate business sector revise significantly downward with the 2019:Q2 publication?"**

Extrapolating Q

The ratio subsequent to the latest Z.1 Fed data (through 2020 Q2) is based on a subjective process that factors in the monthly closes for the Vanguard Total Market ETF (VTI).

Unfortunately, the Q Ratio isn't a very timely metric. The Z.1 data is over two months old when it's released, and three additional months will pass before the next release. To address this problem, our monthly updates include an estimate for the more recent months based on changes in the VTI price (the Vanguard Total Market ETF) as a surrogate for Corporate Equities; Liability.

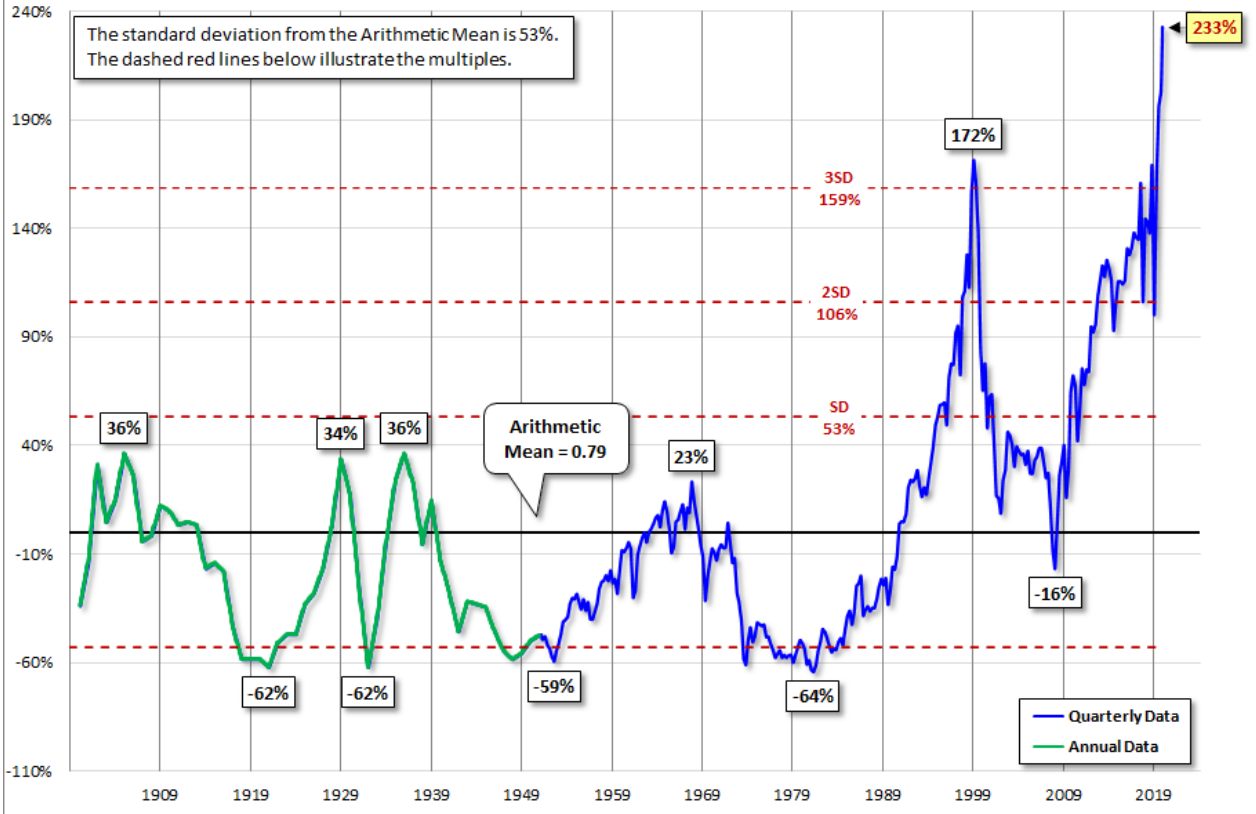The first chart shows the Q Ratio from 1900 to the present.

Q Ratio Since 1900

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Data through December

The Q Ratio is based on data from the Federal Reserve Z.1 Statistical Release, section B.103 Balance Sheet of Nonfarm Nonfinancial Corporate Business. Specifically it is the ratio of Corporate Equities; Liability divided by Corporate Business; Net Worth. Data estimates before 1945 were provided by John Mihaljevic, Dr. Tobin's research assistant at Yale.

Interpreting the Ratio

The data since 1945 is a simple calculation using data from the Federal Reserve Z.1 Statistical Release, section B.103, ***Balance Sheet and Reconciliation Tables for Nonfinancial Corporate Business***. Specifically, it is the ratio of Market Value divided by Replacement Cost. It might seem logical that fair value would be a 1:1 ratio. But that has not historically been the case. The explanation, according to <u>Smithers & Co.</u> (more about them later) is that "the replacement cost of company assets is overstated. This is because the long-term real return on corporate equity, according to the published data, is only 4.8%, while the long-term real return to investors is around 6.0%. Over the long-term and in equilibrium, the two must be the same."

The average (arithmetic mean) Q Ratio is about 0.78. The chart below shows the Q Ratio relative to its arithmetic mean of 1 (i.e., divided the ratio data points by the average). This gives a more intuitive sense to the numbers. For example, the all-time Q Ratio high at the peak of the Tech Bubble was 2.17 — which suggests that the market price was 174% above the historic average of replacement cost. The all-time lows in 1921, 1932 and 1982 were around 0.28, which is approximately 62% below replacement cost. That's quite a range. The latest data point is 233% above the mean. ***Remember, this is extrapolated using the monthly VTI close and the most recent Q Ratio - which is 2.34 as of Q3 2020.***
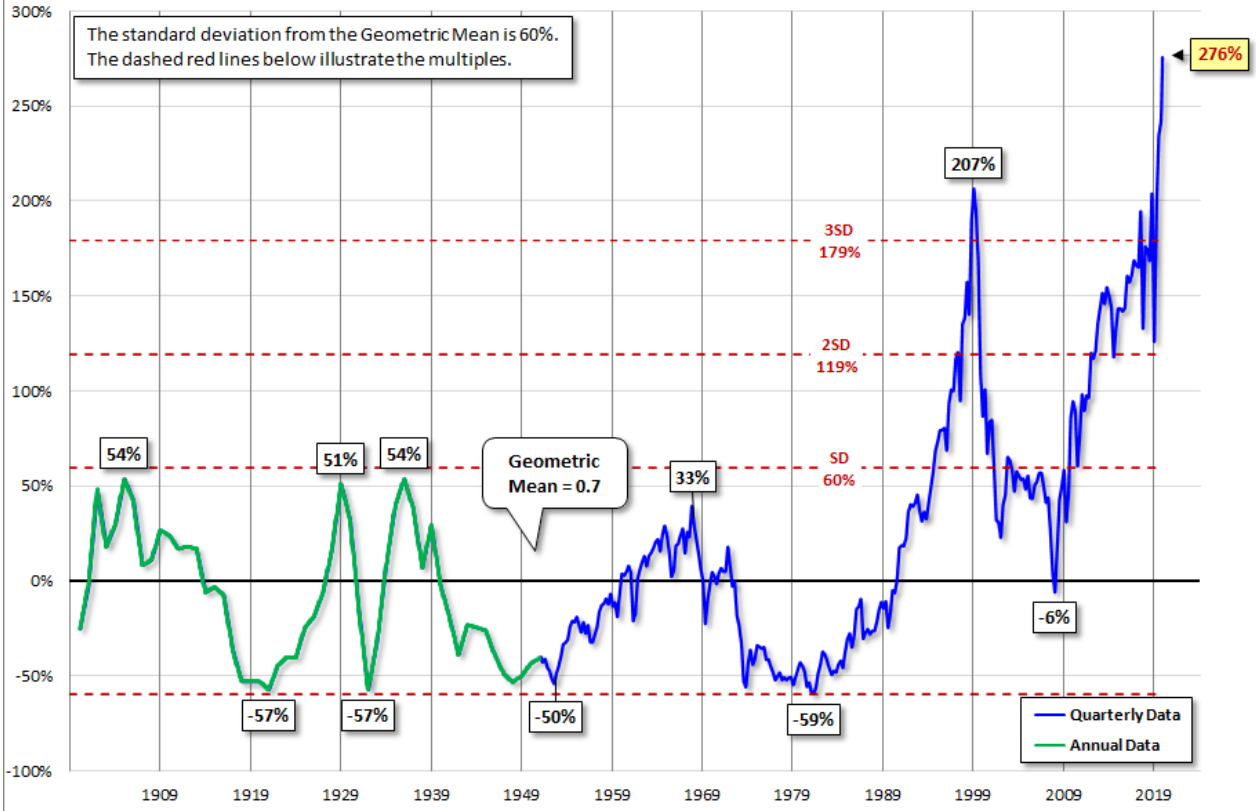
Q Ratio Percent Change from Its Arithmetic Mean
With Standard Deviations Highlighted

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The standard deviation from the Arithmetic Mean is 53%.
The dashed red lines below illustrate the multiples.

233%

172%

3SD 159%

2SD 106%

SD 53%

Arithmetic Mean = 0.79

36%   34%   36%   23%   -16%

-62%   -62%   -59%   -64%

Quarterly Data
Annual Data

Another Means to an End

Smithers & Co., an investment firm in London, incorporates the Q Ratio in their analysis. In fact, CEO Andrew Smithers and economist Stephen Wright of the University of London co-authored a book on the Q Ratio, Valuing Wall Street. They prefer the geometric mean for standardizing the ratio, which has the effect of weighting the numbers toward the mean. The chart below is adjusted to the geometric mean, which, based on the same data as the two charts above, is 276%.
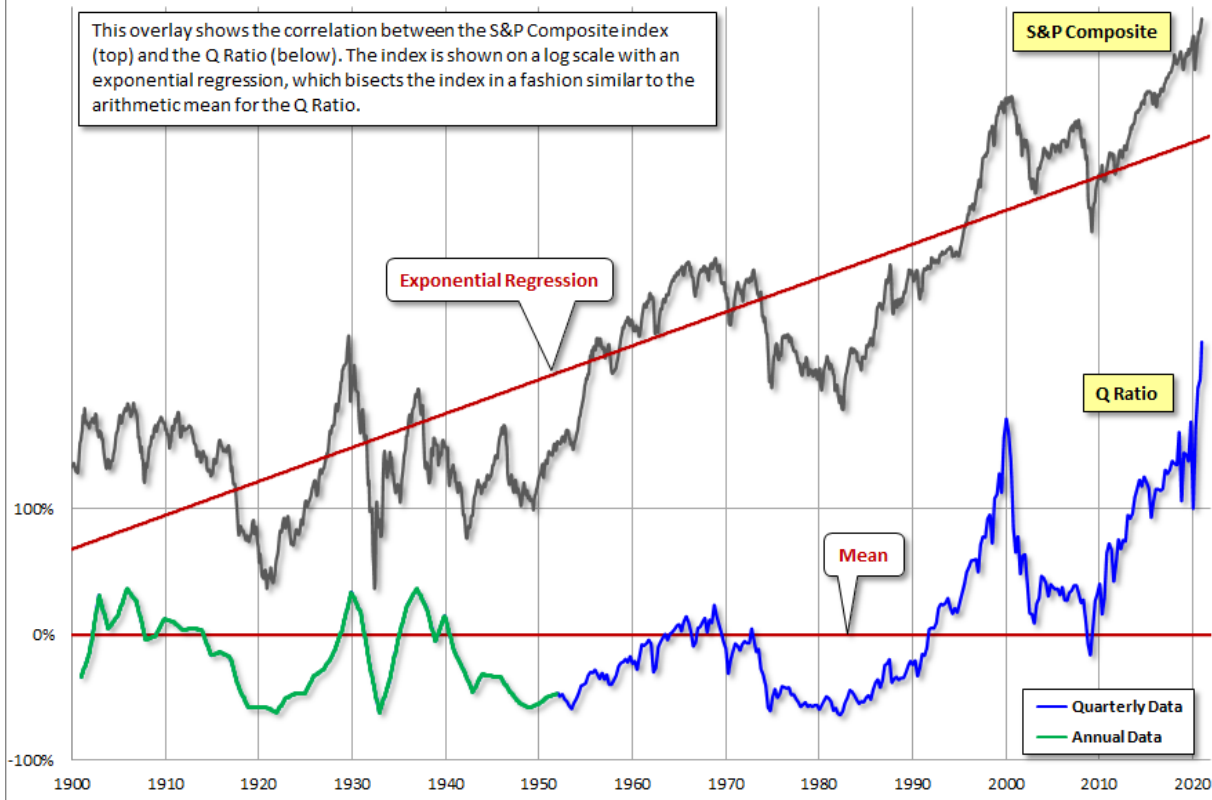
Q Ratio Percent Change from Its Geometric Mean
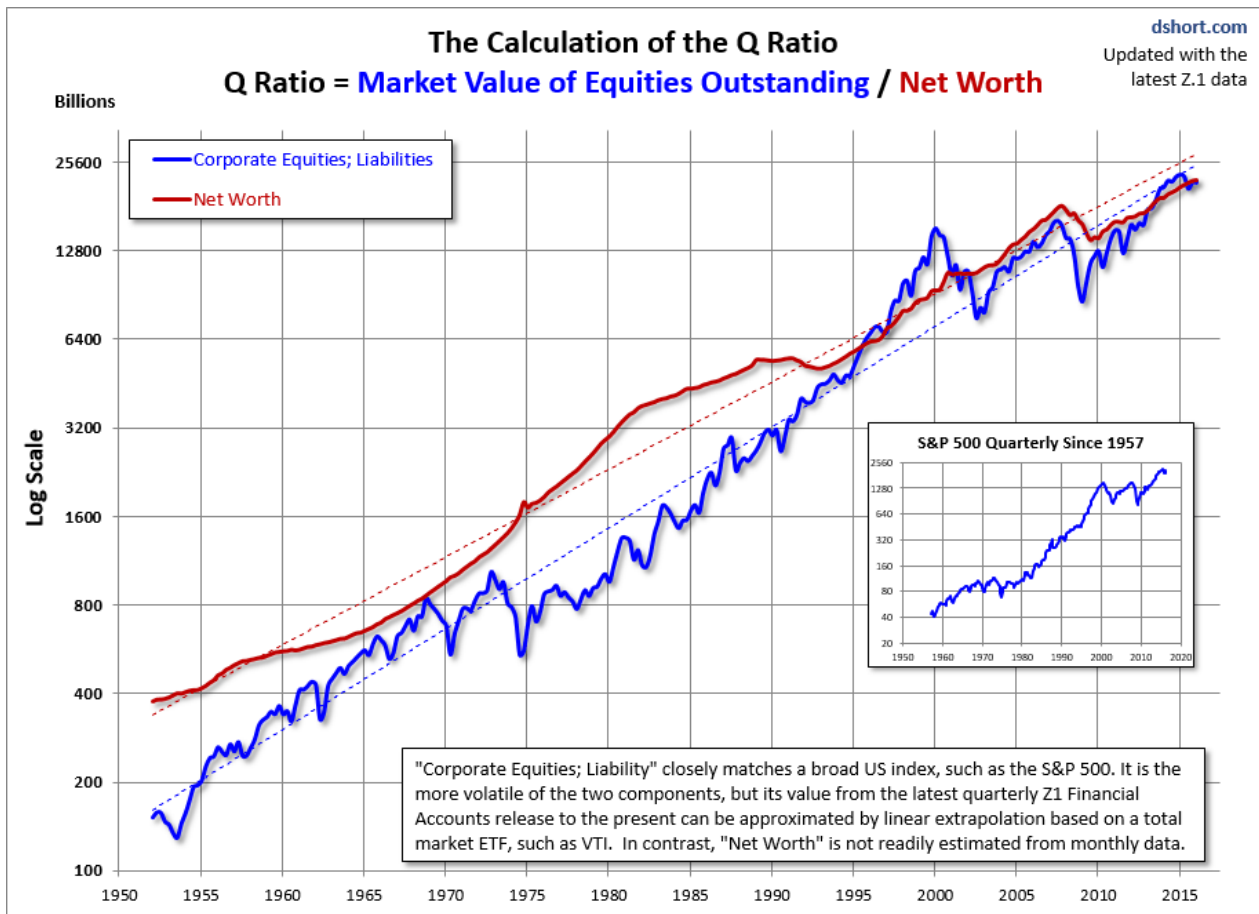With Standard Deviations Highlighted

advisorperspectives.com
January 2021
Data through December

The standard deviation from the Geometric Mean is 60%.
The dashed red lines below illustrate the multiples.

276%

207%

3SD
179%

2SD
119%

54%

51%

54%

Geometric
Mean = 0.7

33%

SD
60%

-6%

-57%

-57%

-50%

-59%

Quarterly Data
Annual Data

The Message of Q: Overvaluation

Of course, periods of over- and under-valuation can last for many years at a time, *so the Q Ratio is not a useful indicator for short-term investment timelines*. This metric is more appropriate for formulating expectations for long-term market performance. As we can see in the next chart, peaks in the Q Ratio are correlated with secular market tops - the Tech Bubble peak and current market values being extreme outliers.

The Real (Inflation-Adjusted) S&P Composite and the Q Ratio Adjusted to Its Arithmetic Mean

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This overlay shows the correlation between the S&P Composite index (top) and the Q Ratio (below). The index is shown on a log scale with an exponential regression, which bisects the index in a fashion similar to the arithmetic mean for the Q Ratio.

For a quick look at the two components of the Q Ratio calculation, here is an overlay of the two since the inception of quarterly Z.1 updates in 1952. There is an obvious similarity between the Fed's estimate of "Corporate Equities; Liabilities" and a broad market index, such as the S&P 500 or VTI. It is the more volatile of the two, but this component can be easily extrapolated for the months following the latest Fed data. The less volatile underlying Net Worth is not readily estimated from coincident indicators.

The Calculation of the Q Ratio
Q Ratio = Market Value of Equities Outstanding / Net Worth

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Updated with the latest Z.1 data

Billions

- Corporate Equities; Liabilities
- Net Worth

S&P 500 Quarterly Since 1957

"Corporate Equities; Liability" closely matches a broad US index, such as the S&P 500. It is the more volatile of the two components, but its value from the latest quarterly Z1 Financial Accounts release to the present can be approximated by linear extrapolation based on a total market ETF, such as VTI. In contrast, "Net Worth" is not readily estimated from monthly data.

The regressions through the two data series to help to illustrate the secular trend toward higher valuations.