
What is the true value of the S&P 500 Index?

Warren Buffett, the renowned value investor, is noted for his ability to respond to sellers of businesses “usually within five minutes” as to whether he is interested in buying that business (at a specified price, of course). He is interested if he can buy the business at a significant discount to its “true worth”. The key, of course, is determining that thing called true worth, or as some say, “intrinsic value”.

I imagine Buffett uses a simple, but extremely powerful, formula that captures the essence of value. Using this tool, anyone can make a fairly accurate estimate of the worth of an individual stock or, for that matter, the S&P 500 Index (“the S&P”), a reasonable measure of the stock market as a whole.

Because the S&P 500 Index (an agglomeration of 500 stocks) has a book value, earnings and an implied dividend it can be analyzed just like any stock.

Equity analysis requires a study of balance sheet items and income variables and they change continually. Thus, it is useful to "normalize" these variables in order to compare performance over time on an apples-to-apples basis. The mathematics is simple and logical.

The first step is to adjust the data for inflation. This reduces the reported numbers to constants which can then be properly compared from year to year. One of the things one notices is that, as time passes, the S&P 500 Index grows in “intrinsic value” by retaining that portion of its earnings which are not paid out as dividends. Earnings are a return on shareholders’ equity, which is commonly called "book value".

Calculating intrinsic value is simplicity itself. Multiply **earnings times an appropriate multiple and you get intrinsic value**. That's it!

Well, that's not *quite* it. You might be wondering what the "appropriate multiple" part is all about. To find the answer, let's go through the valuation process step by step. The following is the essence, the very heart, of intrinsic value:

Book Value (BV) times Return on Equity (ROE) equals Earnings (EPS)

Then, Earnings times a Multiple equals Intrinsic Value (IV)

Book Value is a balance sheet item. While it is quite stable and tends to grow steadily over time due to retained earnings, it can shrink with operating losses or write-offs. It is a solid base on which to anchor the ensuing calculations.

Return On Equity is the annual earnings generated by BV. Since ROE will fluctuate from year to year, it is necessary to stabilize or "normalize" past earnings by using a long term average of those earnings, normally the preceding ten years. Presuming the company's business will not change radically in future, it is possible to reasonably estimate a company's returns on invested equity going forward.

If there are write-offs to BV, it means that earnings in prior years were overstated and the average ROE must be adjusted downwards. The effect is that the previously estimated future ROE must be lowered accordingly.

Normalized Earnings is the long term "average" earnings level. For the S&P 500 Index this is equivalent to the "coupon", or interest rate, of a bond.

Because stock and bond investments compete for investor funds head to head in the marketplace, the equity Multiple (often referred to as the price/earnings multiple, or p/e ratio) is, *generally speaking*, a function of interest rates - long term corporate interest rates to be precise. The Multiple is simply the inverse the AAA corporate long bond yield. There is a Wall Street precept that "the most powerful force in the investment markets is regression to the mean". What is the "mean" long term bond rate you might ask. Historically the mean interest rate on long term corporate bonds is about 7%. And that mean rate covers a period which includes the early 1980s when rates topped at 18.2%, the Depression-era when corporate bonds normally traded at 5.0% and today's artificially depressed 2.9%.

So, if the long bond yield is 7%, then the appropriate p/e multiple should be 100 divided by 7, or about 14.3 times. This Multiple can then be applied to the S&P Index.

Now that we have the pieces in place we are ready to calculate the intrinsic value of the S&P 500 Index. It looks like this:

Book Value of S&P 500, est. Dec. 2019	914
(times) Average Return on Equity (since 1960):	15.0%
(equals) Normalized Earnings:	137
(times) Appropriate Multiple (100/7%):	14.3
(equals) Intrinsic Value:	1960

On June 16, 2020 the S&P 500 Composite Index closed at 3125 – it is overpriced by roughly 60% according to our calculated Intrinsic Value.

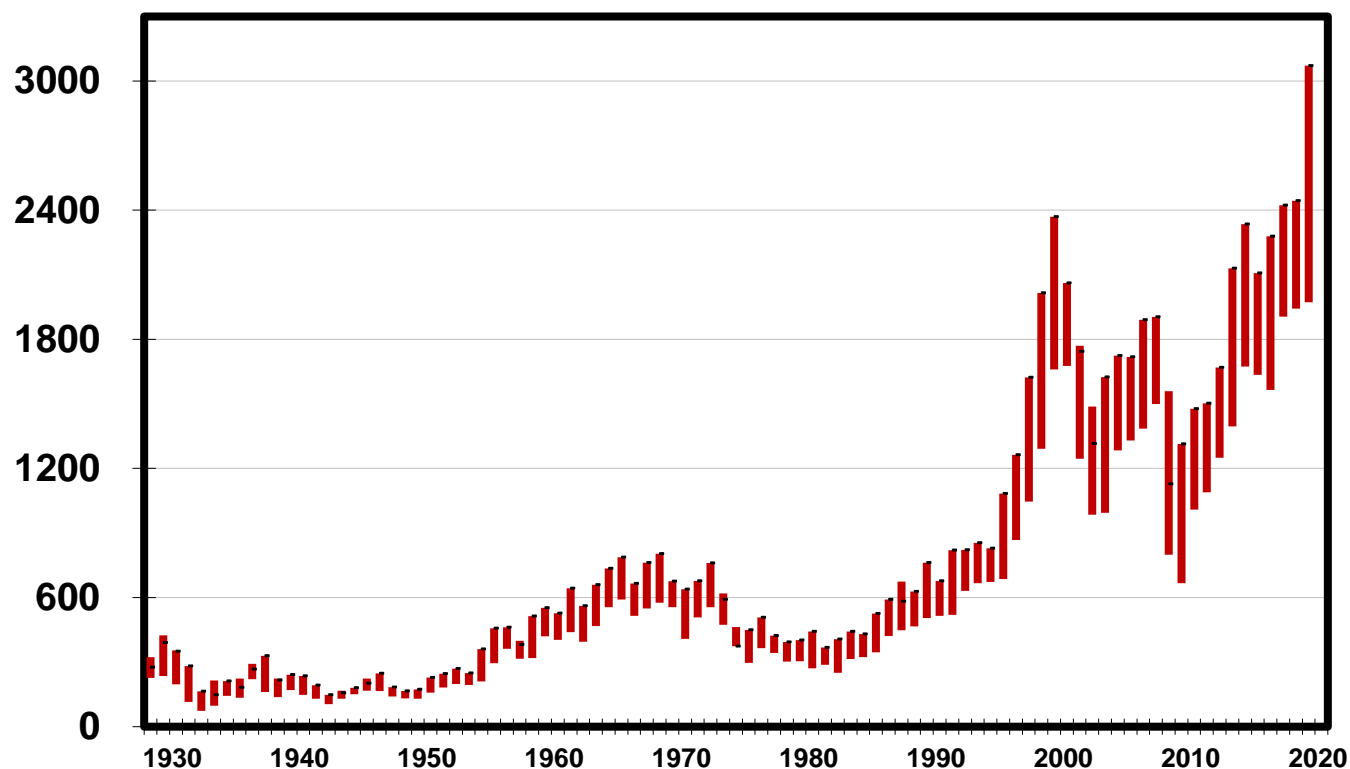
Historically, the average ROE has been approximately two times the long term corporate AAA bond yield - this is a key relationship. In the above Intrinsic Value calculation you can change the ROE and the Multiplier to suit yourself, but make sure that your numbers conform to the 2-1 ratio.

Will 15% be an average ROE in future? Will corporate bond interest rates regress to 7%? And if things do change, how long will it take?

There are times when the 2:1 ratio gets seriously out of whack - in 1982 the ROE was 11.6% while the AAA corporate bond rate stood at 13.8%, a ratio of only 0.84 instead of 2. However, by 1988 things got back into line as the S&P's ROE was 18% and the AAA corporate bond yield fell below 10%.

Today the market is out of whack again - this time the S&P's ROE is about 15% and AAA corporate long bond yields are under 3%. A return to an equilibrium relationship will require either a rise in interest rates or a decline in earnings, or some combination of the two.

S&P 500 Index in Constant US Dollars



A study of the regression of the S&P's real prices shows a rising trend reflecting the fact that stock values increase over the long haul in line with growing profits and retained earnings. Deviations from this trend identify undervaluations, such as the one that developed in the early 1980's, as well as the overvaluation bubble of the late 1990's - and today! While the regression process affects intrinsic value as new data is incorporated, it shows clearly that market prices eventually revert to some long term "mean" or real value.

This analysis is deliberately simple – it incorporates only essential factors in order to arrive at valid conclusions - conclusions that form the rock solid foundation of portfolio construction.

In the long run, reversion to the mean is evident in many areas of the markets – earnings, stock prices, interest rates, currencies, commodity prices - they fluctuate, yet they all somehow return to their own equilibrium levels.

For the past decade investors have been mesmerized by bubble stock markets. Share prices have soared since 2009 and the danger of owning stocks has increased commensurately. Bargains are rare. Stock investors should be aware of the perils now. Perhaps Warren Buffett has come to the same conclusion.

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