

Rocaton

INSIGHTS

*Equity Market Valuations:
A Review of CAPE Ratios*

August 2015

203.621.1700 | rocaton.com

© 2015, Rocaton Investment Advisors, LLC

EXECUTIVE SUMMARY

- * There are many different valuation measures used to assess public equity markets, many of which can be useful in projecting future returns.
- * Rocaton prefers to use cyclically adjusted price-to-earnings (“CAPE”) ratios as this measure has been a relatively reliable predictor of long-term equity market returns.
- * There are a number of imperfections with CAPE ratios, including their inability to predict short-term movements in equity markets.
- * Based on current CAPE ratios, U.S. equity markets appear to be expensive while emerging equity markets appear cheap.
- * Investors wishing to make a tactical decision based on current levels should be prepared to keep any over/underweights in place for a multi-year period or until valuations trade back to normal levels.

Introduction

There is no perfect measure for assessing the value of public equity markets, but the price-to-earnings ratio is both logical and certainly one of the most popular metrics. Any reasonable measure of valuation should compare some definition of value to “price” which, of course, is the easy part. It is the measure of long-term value that is the subject of much debate and controversy. One logical metric is earnings given that common stock shareholders as business owners have a claim on current and future earnings. The definition of earnings, however, is subject to interpretation. Both the time period (e.g. trailing or forecasted) and the type (e.g. operating or total) of earnings can be adjusted to create different price-to-earnings measures, all of which may be appropriate in different contexts. Rocaton prefers to use cyclically adjusted price-to-earnings (“CAPE”) ratios, sometimes referred to as normalized P/E ratios or the Shiller P/E ratio¹. This measure uses the average of the prior ten years of trailing earnings (inflation adjusted). While we don’t expect CAPE ratios to have perfect predictive power, the measure has proven to be reliable over longer time periods, which we believe are aligned with most institutional investors’ time horizon. The balance of this paper will review the predictability of CAPE ratios, address some of the criticisms of CAPE ratios and examine where current equity market valuations are today.

Why use a CAPE ratio?

The primary reason for using a CAPE ratio is that it smooths out fluctuations in the earnings cycle by using a ten-year look back period. P/E ratios that use trailing one-year earnings may be distorted, at times, given the highly volatile nature of earnings from year to year. Consider the 2009 time period when trailing one-year earnings for the S&P 500 approached zero, or the

¹ The CAPE ratio was popularized in “Irrational Exuberance” by Robert Shiller, professor of economics at Yale University.

more recent time period, which has been marked by record earnings and peak profit margins. During time periods such as these, when earnings are at cyclical highs or lows, the trailing one-year P/E ratio can be distorted and misleading as a valuation measure.

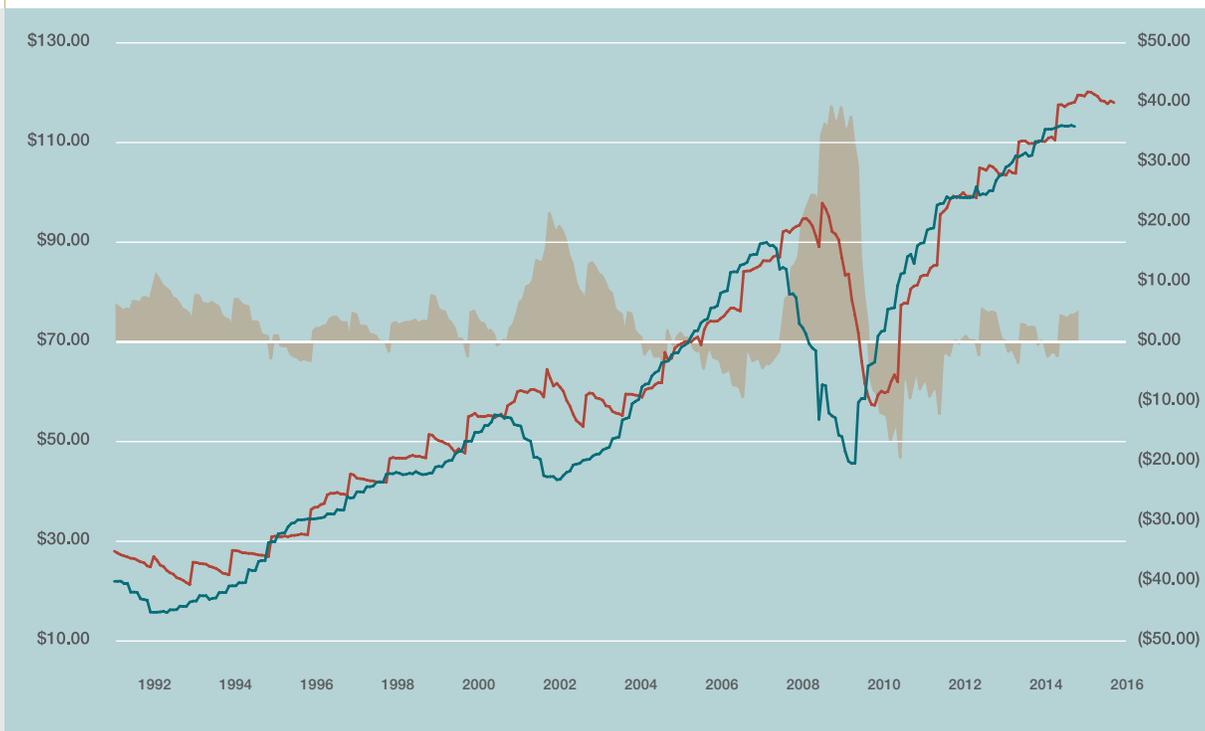
Problems also exist with measures that use forecasted earnings. Most notably, analyst forecasted earnings are almost always too optimistic, and tend to lag reality at inflection points in the market such as 2001/2002 or 2008/2009 (see Figure 1 below). This can make P/E ratios based on forecasted earnings look cheap relative to P/E ratios that use actual (e.g. lower) earnings. The CAPE ratio strives to create a more stable measure of earnings that is relevant to long-term equity market earnings and valuations. We are quick to point out that the ten-year time period is somewhat arbitrary, but this length of time has generally been accepted for many decades².

Figure 1:
S&P 500 Forecasted Earnings vs. Actual Earnings

Legend:

- Difference (RHS)
- Forecasted EPS (12 months forward)
- Trailing 12 Month EPS

Source: Bloomberg



How predictive are CAPE ratios?

As we mentioned at the outset, there are no equity market valuation metrics that will forecast future returns with complete accuracy. However, the CAPE ratio has been a reasonable long-term gauge of value and a signal for the magnitude of returns investors can expect over a ten-year time period. As shown in Figure 2 on the next page, when CAPE ratios are low, subsequent ten-year returns tend to be high and vice versa. For investors who consider relying on CAPE ratios as a signal for long-term asset allocation decisions, it is important to understand the limitations of this measure as a signal over shorter time periods. Historical data suggests that CAPE is somewhat unreliable in the short-term as idiosyncratic events can cause markets to trade away from fair value. For example, using data back to 1928 for the S&P 500, the

² In their publication of “Security Analysis” (1934) Graham and Dodd suggested looking at profits for “not less than five years, preferably seven or ten years.”

R-squared of the starting CAPE ratio and the next one-year return was only 0.08. If we extend the time period to five-years the R-squared improves to 0.33 and finally, if we extend the time period to ten-years, the R-squared improves further to 0.51. While these results are not flawless, we believe it is important to focus on the improvement in results as the time period is extended, indicating the usefulness of CAPE as a long-term predictor of future returns rather than a short-term forecasting tool³. Investors wishing to use CAPE ratios as a trading signal should not make tactical portfolio allocation shifts based on the metric unless they have at least a five to ten year time horizon for those decisions to potentially work out.

Lastly, as we have pointed out, there are a number of additional valuation metrics such as one-year P/E ratios, dividend yields, market capitalization-to-GDP, and the Fed Model, which could be used to forecast market returns. All of these models have shown a limited ability to predict equity market returns over the short-term and their predictability of returns over the long-term are generally no better than the CAPE ratio methodology we have outlined.

Figure 2:
S&P 500 CAPE Ratio
and Subsequent
10-Year Return

Legend:

- Starting S&P 500 CAPE Ratio (LHS)
- Subsequent 10 Year S&P Return (Inverted RHS)

Sources: Standard & Poors; Shiller; Bloomberg. S&P 500 returns are price return from 1881 – 1927 and total returns thereafter.



Criticisms of the CAPE ratio

While we have presented the benefits of using a CAPE ratio, there are some potential issues with the measure. Since the ratio uses trailing ten-year average earnings, the CAPE metric can be slow moving and may trend in one direction for many years. As an example, the S&P 500 CAPE ratio has been above its long-term average of 16.6x since June 2009 and only briefly dipped below that average for seven months in late 2008 / early 2009. As a result, the signal does not provide much insight into when markets will turn and has not been a reliable indicator of short-term performance (i.e. less than three-years). This could also be said for virtually

³ R-squared is a statistic measure that provides information about the goodness of fit of a model. The highest possible value is 1, which indicates that the regression line perfectly fits the data.

any valuation metric as markets often trade well above or well below long-term average valuations for long periods of time.

Another criticism of the measure is that it places less emphasis on recent earnings trends. Many critics cite the current high profit margins enjoyed by U.S. companies as not receiving enough weight in the CAPE ratio given its ten-year look back period. We take the opposite view and believe that profit margins are cyclical based on the principle that capital will flow into highly profitable markets in an attempt to capture those profits and the resulting competition will drive down margins. Other similar arguments about the changing nature of earnings are used to invalidate the CAPE ratio⁴. Again, the simplicity of the CAPE ratio is that the averaging is designed to smooth out the highs and lows.

One additional criticism is that CAPE ratios do not account for the interest rate environment or the discounting that should apply to future earnings much like a dividend discount model would. While this is a fair criticism, if one views interest rates as cyclical over the long-term as well, the reversion to the mean of interest rates should be one of several factors which might cause CAPE ratios to revert back toward long-term averages.

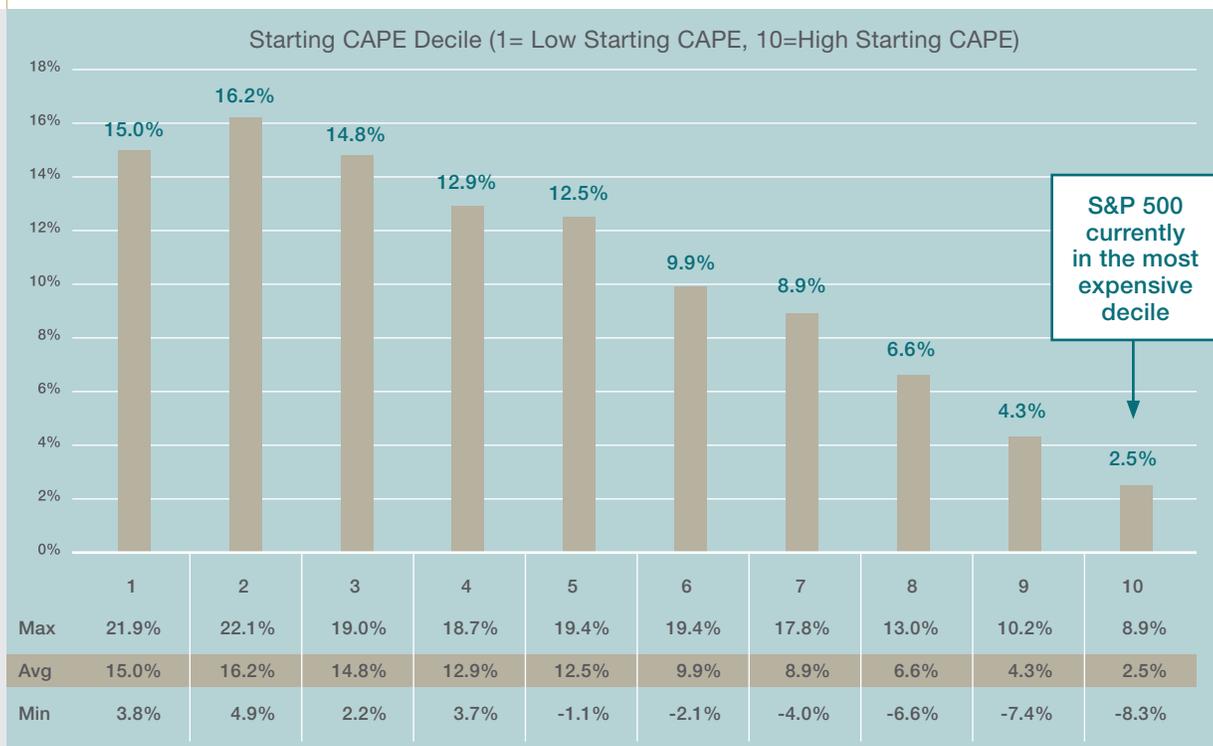
Given these criticisms, some of which are rational, investors may wish to use multiple valuation measures in an effort to avoid making portfolio decisions based on a single metric. Rocaton also believes that investors should not simply use the long-term average CAPE to determine fair value. For context, Rocaton's long-term equilibrium expectation for U.S. CAPE ratios is 20.0x which is modestly above the long-term average of 16.6x. We arrive at this number by looking at the prior 50 years of data as opposed to the full data set. Our equilibrium of 20.0x also translates into an earnings yield of 5% which we believe better aligns with our long-term equity market return forecast of 7%.

Where are we today?

As of July 31, 2015, the S&P 500 CAPE ratio was 26.4x. This is well above the market's long-term average and is only eclipsed by levels reached in 1929 prior to the Great Depression (peak of 32.6x) and in 1999 prior to the dot-com bubble bursting (peak of 44.2x). In fact, today's level is higher than 93% of all observations dating back to 1881 and greater than 84% of observations in the last 50 years. As we have pointed out, the CAPE ratio can remain well above its long-term average for many years and today's levels do not necessarily signal that we are in a bubble. However, higher CAPE ratios typically lead to lower long-term returns. Figure 3 on the next page sorts S&P CAPE ratios by decile and shows the average ten-year return from those starting levels. Today we are in the 10th (i.e. most expensive) decile which has led to an average total return of 2.5% over the subsequent ten-year period. Speaking more generally, the figure shows that there is a close relationship between the average ten-year return an investor can expect and the starting CAPE ratio. The figure also displays the maximum and minimum 10-year total return from each starting decile.

⁴ The introduction of FASB 142 (goodwill impairment accounting, June 2001) and the suspension of FASB 157 (mark-to-market of assets, issued in September 2006, suspended in April 2009) are two often cited examples.

Figure 3:
Average 10-Year
Total Returns for
S&P 500 From
Starting CAPE Decile
(since 1928)



Sources: Standard & Poors; Shiller. Based on monthly total return data.

The outlook for non-U.S. equity markets, both developed and emerging, is better when using CAPE ratios as the basis. As of July 31, 2015 non-U.S. developed equity markets (MSCI EAFE) were trading at a CAPE ratio of 16.1x and emerging market equities (MSCI Emerging Markets) were trading at a CAPE ratio of 11.6x. Although we have less historical data for these markets than we do for the U.S. market, these levels are in the third and first (i.e. cheapest) deciles for each market, respectively. There is of course no guarantee of future returns and there are some fundamental issues with non-U.S. markets, but purchasing assets at a lower valuation level has historically led to higher returns in the future.

Conclusion

Accurately predicting future equity market returns is a difficult task and there are many measures which could be used to develop such forecasts. Further, there are flaws with almost all valuation measures. Cyclically adjusted price-to-earnings ratios, while not without issues, have provided a reliable mechanism for estimating the long-term magnitude of equity market returns. Investors should be aware that the measure is not ideal for predicting short-term movements in equity markets and investors who tilt their portfolios based on this measure should be prepared to maintain these positions for a multi-year period or until markets trade back to a more normal range.

Rocaton

Equity Market Valuations: A Review of CAPE Ratios

Disclosures

Rocaton is registered as an investment adviser with the U.S. Securities and Exchange Commission. Rocaton's Form ADV, Part 2 is available upon request. The information included in this publication has been taken from sources considered reliable. No representations or warranties are made as to the accuracy or completeness of this information and no responsibility or liability (including liability for consequential or incidental damages) is assumed for any error, omission or inaccuracy in this information. This information is subject to change over time. This publication is not intended as investment or actuarial advice. Before acting on any information contained in this material you should consider whether it is suitable for your particular circumstance and consult with your actuary. Any opinions expressed in this publication reflect our judgment at this date and are subject to change. No part of this publication may be reproduced or redistributed in any manner without the prior written permission of Rocaton Investment Advisors, LLC.

Performance Information and Return Expectations

The analysis contained in this document may include projections of long-term return and risk expectations. There is no guarantee that the projected returns or risk will be realized. The projections are based in part on historical performance of various asset classes, and past performance is no guarantee of future performance. The projections include assumptions, including those regarding risk and return. These assumptions are used for modeling purposes only and may not be realized. Because the analysis is based on assumptions and projections, there can be no warranties or guarantees.

203.621.1700 | rocaton.com

© 2015, Rocaton Investment Advisors, LLC