Portfolio Construction Forum

Earnings yield as an estimate for expected returns[1]

Douglas Isles | Platinum Asset Management | 17 December 2018

In a presentation at Portfolio Construction Forum Strategies Conference 2017, Andrew Clifford, Chief Investment Officer at Platinum Asset Management, argued that "index obsession is unhealthy and leads investors astray".[2]

Clifford's central thesis was that, at its core, investing is about deploying savings into assets that generate a return. He focused primarily on equity investing. Rather than allowing abstractions such as indices to distract and misguide one from the underlying reality of a business and its implied return, Clifford argued that equity investors should focus on earnings yield as a core metric to evaluate stocks relative to each other, and to other asset such as bonds and risk-free alternatives. The most challenging part of equity investing is to accurately assess a company's earnings prospects.

Clifford used Samsung Electronics[3] as a case study to demonstrate that earnings yield can be used to effectively assess an equity investment - and that, over longer time periods, stock returns are a function of cumulative earnings.

This paper studies the long-term returns of the US market to investigate whether earnings yield proves to be a reasonably reliable estimate of forward real returns more generally.

- Section 1 of this paper briefly sets out the theoretical basis for using earnings yield as an approximation for expected real returns.
- Section 2 examines historical data from the US stock market, concluding that empirical evidence supports this.
- Section 3 uses this predictive power to give a sense of the potentially alarming journey the US market may take over the next 15 years.

SECTION 1: THE BASIC THEORY

Firstly, earnings yield is generally defined as earnings per share (EPS) divided by the share price (P)[4] or:

$$Earnings\ yield\ = \frac{EPS}{P}$$

Earnings comprise dividends (D) and retained earnings per share (RE), hence:

$$Earnings\ yield\ = \frac{D + RE}{P}\ =\ \frac{D}{P} + \frac{RE}{P}$$

The Gordon Growth Model[5] suggests that the price of an equity is a function of the next Dividend (D), future growth in dividends (g) and the required rate of return (r).

$$Price\ (P)\ = \frac{D}{r - g}$$

This can be manipulated to show, at the time of investment that:

$$Required\ return\ (r) = \frac{D}{P} + \ g$$

However, this is a theoretical valuation. At another point in time, the variables will have changed, as new information comes to light. The return achieved by owning a share will comprise the dividends received, growth achieved, and other changes in price, which result from changes in the required return, or changes in perceived future growth prospects.

Therefore, the real return from an equity investment can be described as comprising the starting dividend yield (D/P), real growth in dividends (g), and any change in valuation (ΔV) (defined to be a general term reflecting both changes in future prospects or the required return). This can be expressed as:

$$Real\ return\ = \frac{D}{P} + g + \ \Delta V$$

As both the earnings yield equation and the real return equation include dividend yield (D/P) as a component, earnings yield will equal real return if "retained earnings yield" (RE/P) is equal to the sum of real growth in dividends (g) and change in valuation (ΔV):

$$Real\ return = Earnings\ yield$$

if

$$\frac{RE}{P} = g + \Delta V$$

Historical data indicates that while changes in valuation tend to have a dominant influence on short-term outcomes, their impact, on average, is reduced over the long-term.[6] Therefore, it is a reasonable approximation that the expected value of this term over all time periods is close to zero.

Real growth in dividends, on the other hand, is a reflection of a company's ability to reinvest its retained earnings (i.e. those profits that are not distributed to shareholders in the form of dividends). Real dividend growth should be a function of retained earnings, and the returns achieved on these.

The impact of retained earnings on earnings growth is first understood by examining the limited number of ways in which a company can apply its retained earnings:

1. **Pay down its debt or accumulate cash** – The retained earnings thus applied will generate a return equal to the amount of interest saved or earned.
2. **Buy back shares** – The retained earnings used to buy back the company's shares will reduce the number of shares on issue, providing a commensurate boost to per share outcomes.
3. **Invest via mergers and acquisitions (M&A) or via capital expenditure**[7] – M&A multiples are a function of stock market valuations which determines returns to shareholders. Returns from capital expenditure needs to be judged on a case-by-case basis.

If profitability (ROE) remains constant, earnings growth will be proportional to the retained earnings over the existing equity (book) (RE/B) of the firm. In reality, decisions made will likely lead to changes in ROE, whether by changing earnings prospects of the firm or amount of equity.

Note that when Price to Book ratio is greater than 1[8] - which is normal in the US market - then (RE/B) > (RE/P). That is, the nominal reinvestment rate will be higher than the "retained earnings yield". However, inflation[9] needs to be taken into account, and the potential real growth rate is therefore lower than the nominal growth rate.

Long-term data from the US market bears this out. Between 1871 and 2017, the S&P 500 had an average dividend yield (D/P) of 4% per annum, average retained earnings per share over share price (RE/P) of 3% per annum, and real dividend growth of 2% per annum.[10] However, given the quantum of the

various components, an average earnings yield of 8% per annum and real returns of 7% per annum are therefore broadly supportive of the assertion that earnings yield is a useful estimator of real returns.

SECTION 2: LONG-TERM DATA ON US MARKET

In this section, the relationship between earnings yield and real returns is examined more closely, using the 1871 to 2017 US stock market data collected by Professor Robert Shiller.[11] We test whether, over time, the aggregate market earnings yield provides a reasonable estimate for real market returns. In particular, consideration is given to:

a. earnings yield versus real returns over the medium term;

b. the interplay between earnings growth and valuation; and,

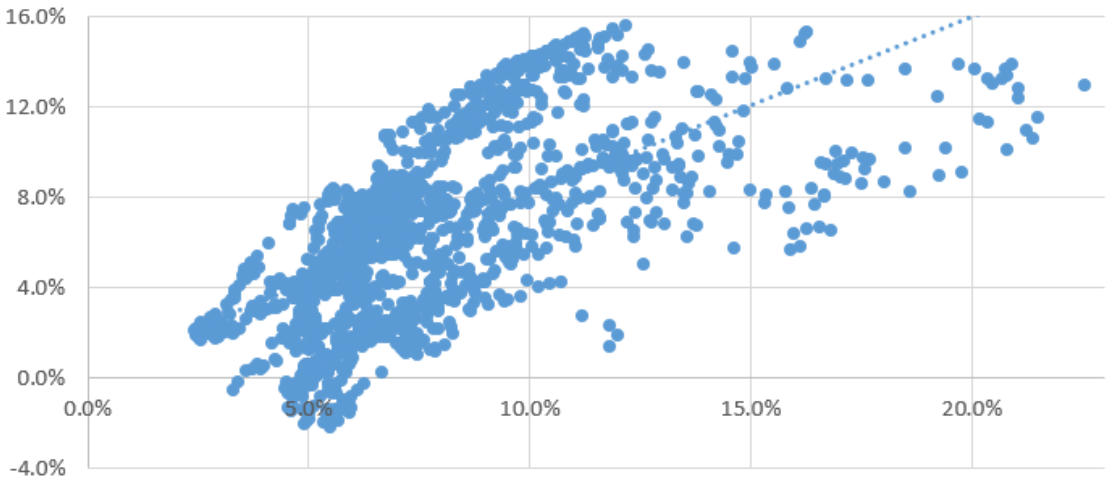
c. accumulated earnings since investment against valuation and returns.

Part a: Earnings yield vs. Real return

Monthly time series data from 1881 to 2002 suggests that there is a 52% correlation between the earnings yield and forward 15-year real returns - but using Shiller's cyclically adjusted price-to-earnings ratio (CAPE ratio) increases this to 65%. Shiller's CAPE has been widely recognised as a better valuation tool than a simple P/E ratio. The CAPE ratio is adjusted for inflation and uses smoothed real earnings to eliminate the fluctuations in net income caused by variations in profit margins over a typical business cycle.[12]

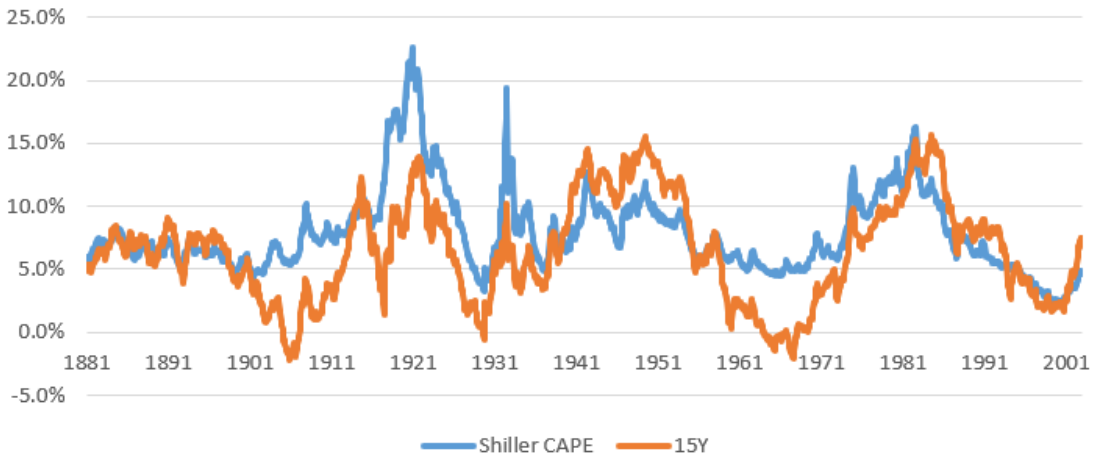
Throughout this paper, forward returns are taken as 15-year real returns from a point in time.

Figure 1: Shiller CAPE (X) v 15Y Real Returns (Y)



Source: Platinum Asset Management, http://www.econ.yale.edu/~shiller/data.htm

Figure 2: Time series of Shiller CAPE v 15Y Real Returns



Source: Platinum Asset Management, http://www.econ.yale.edu/~shiller/data.htm

The 65% correlation between the starting earnings yield and forward real returns suggests some merit in using the Shiller CAPE to predict returns. However, there are periods where returns were consistently lower, around the early part of the 20th century and in the 1960s and 1970s. But simply put, buying on low earnings yields has not been lucrative and the worst periods of real returns have broadly coincided with period when the starting earnings yields are low.

That the CAPE ratio provides a useful gauge for forward returns over the medium-term is not a new insight. The above analysis, using the smoothing of forward returns, simply reiterates Shiller's work[13] and demonstrates the value of paying attention to starting earnings yields when making medium- or long-term investment decisions.

Part b: Growth and valuation interplay

As outlined in Section 1 of this paper, real returns from an equity investment are a function of dividend yield, real growth in dividends, and change in valuation. The starting dividend yield at the time of investment is known while the unknown elements are growth in dividends, which assuming the payout ratio remains unchanged, is equivalent to growth in earnings[14], and change in valuation. The assessment of these variables constitutes the primary endeavour of fundamental investment analysis. Investigating the interplay of these two factors gives a better sense of the return drivers.

One can look at the annualised earnings growth rate of the S&P 500 over the period. This makes the change in valuation (ΔV) the balancing item in the equation for real returns:[15]

$$Real\ return\ == \frac{D}{P} + g + \Delta V$$

There is a 93% correlation between g + ΔV and the 15-year return outcomes, suggesting this interaction is critical. Individually, the change in value term with 59% correlation to the outcome is marginally more significant than the growth term's 50% correlation. Growth is defined as 15-year earnings growth.

One can then examine each quartile of data in terms of growth and starting valuation. This reveals that the raw earnings yield at 65% has a higher correlation with the valuation change than the Shiller CAPE at 46%.

For the 1464 observations, one can look at the starting earnings yield and the subsequent change in valuation by quartiles.

Figure 3: Starting earning yield vs change in valuation

Starting Earnings Yield	Average Change in Valuation (pa)	Real Return Outcome
1st Quartile (9.0% to 18.8%)	+3.4%	10.2%
2nd Quartile (6.9% to 9.0%)	+0.9%	6.5%
3rd Quartile (5.7% to 6.9%)	-1.3%	4.7%
4th Quartile (2.1% to 5.7%)	-2.1%	4.5%

Source: Platinum Asset Management

Secondly, one can observe where earnings are against trend, and look at the subsequent growth. This is done using the FORECAST function in Excel. At any point in time, the ratio can be computed between actual earnings and forecast earnings based on the trend in earnings from 1871 to that point.

Figure 4: Starting earnings against trends vs growth

Starting Ratio of Earnings over Trend Earnings	Average Growth (pa)	Real Return Outcome
1st Quartile (0.22 to 0.87)	+3.9%	8.5%
2nd Quartile (0.87 to 1.10)	+1.8%	7.5%
3rd Quartile (1.10 to 1.28)	+0.9%	5.7%
4th Quartile (1.28 to 1.69)	+0.4%	4.2%

Source: Platinum Asset Management

So, in essence, both starting valuation and growth versus trend provide some predictive power for future changes in valuation and future growth. It is then helpful to look at the interaction between both variables, by considering the return outcomes from the starting values of both variables.

Figure 5: Return outcomes from starting values of both variables

Starting Quartiles (per Tables 1 and 2)	Number of Observations	G + ΔV	Real Return Outcome
Either EY or E/TE in 1st	664 (45%)	3.9%	9.3%
Other Combinations	458 (31%)	1.2%	5.5%
Both EY and E/TE in 3rd or 4th	342 (23%)	-0.7%	2.3%

Source: Platinum Asset Management

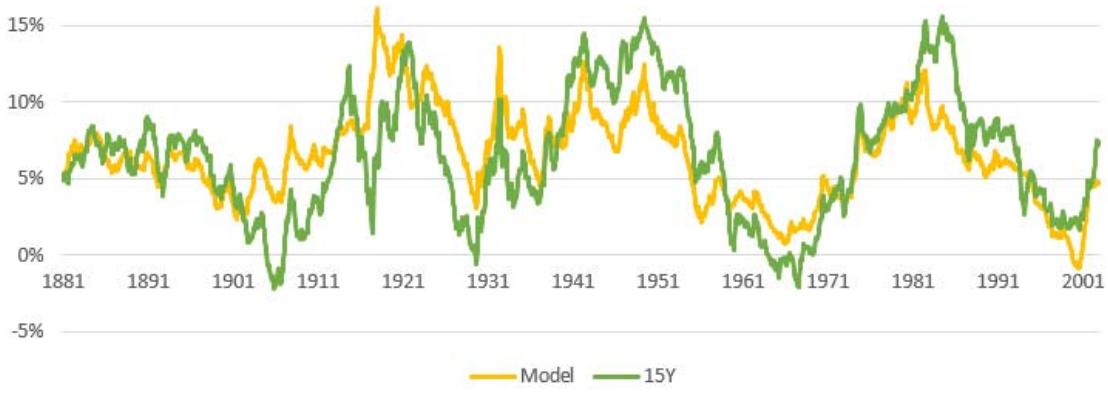
This analysis has enabled the development of what looks to be a robust conceptual framework, which can then be developed into a model using regression analysis in Excel.

The model has a correlation of 73% and demonstrates a statistically significant outcome.

Forecast 15-year total real return = **7.75% - 7.5% * (Earnings v Trend) + 90% * Earnings Yield**

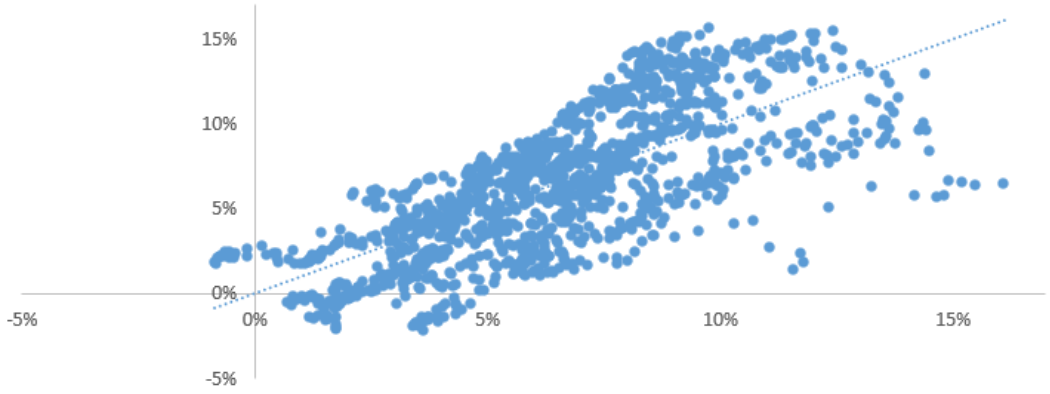
This can be plotted over time to show the relationship over the period from 1881 to 2002.

Figure 6: Forecast returns versus actual returns



Source: Platinum Asset Management

Figure 7: Model forecast returns (X) versus actual returns (Y)



Source: Platinum Asset Management

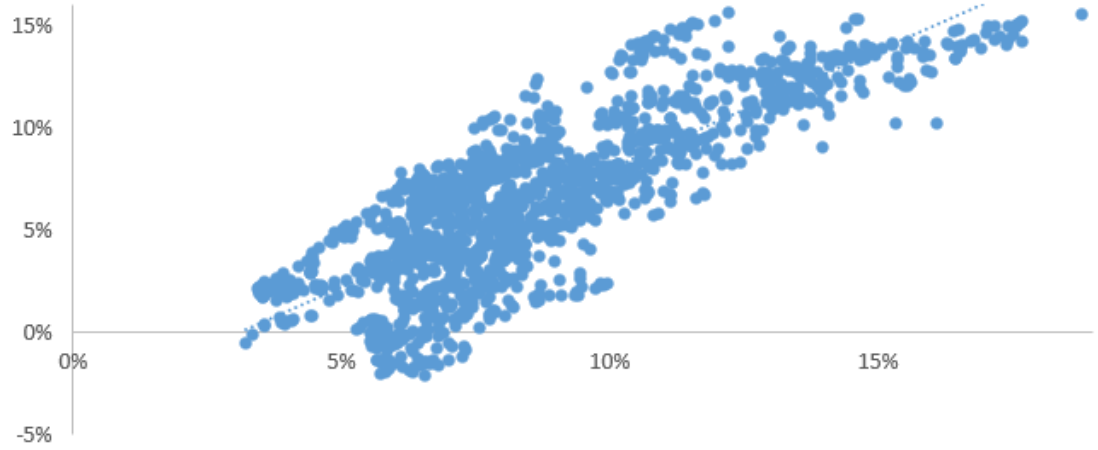
Part c: Accumulated earnings

Looking at earnings from an owner's perspective, one can observe aggregate earnings over 15 years as an annualised return on the original investment. There is a 82% correlation between this number and return made from the investment, which is stronger than the model described above. However, it is not observable in advance, so there is no practical value in this observation other than to note that the strong relationship between owner earnings and long-term stock returns is critical and the basis of Clifford's Samsung Electronics case study at the Forum.

However, it is worth noting that the Shiller CAPE has a 73% correlation with this datapoint, which is slightly higher than the Earnings Yield on its own at 68%. One might say that the Shiller CAPE is a good predictor of the aggregate earnings yield, which in turn predicts investment returns.[16]

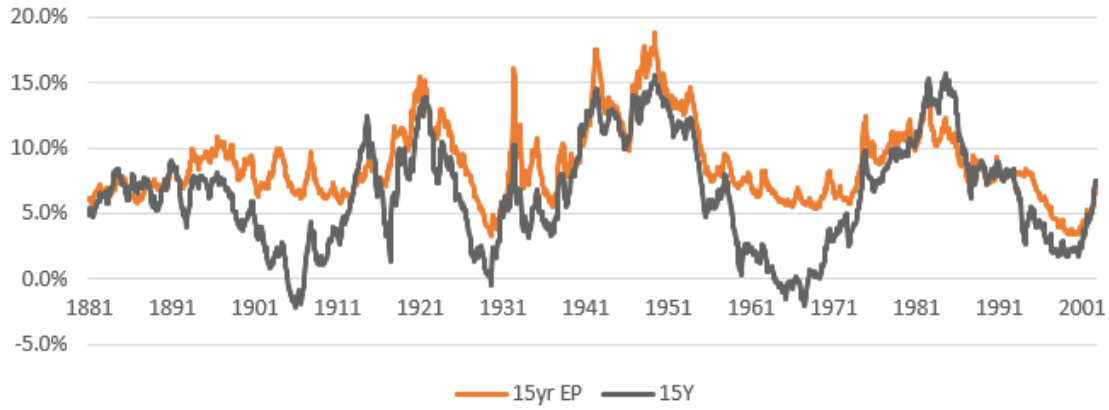
In reality, even for the best of analysts, the idea of a 15-year earnings forecast is, at best, a leap of faith.

Figure 8: 15Y Agg Earnings / Price (X) v Returns (Y)



Source: Platinum Asset Management

Figure 9: Time series of 15yr Aggregate Earnings v Returns



Source: Platinum Asset Management

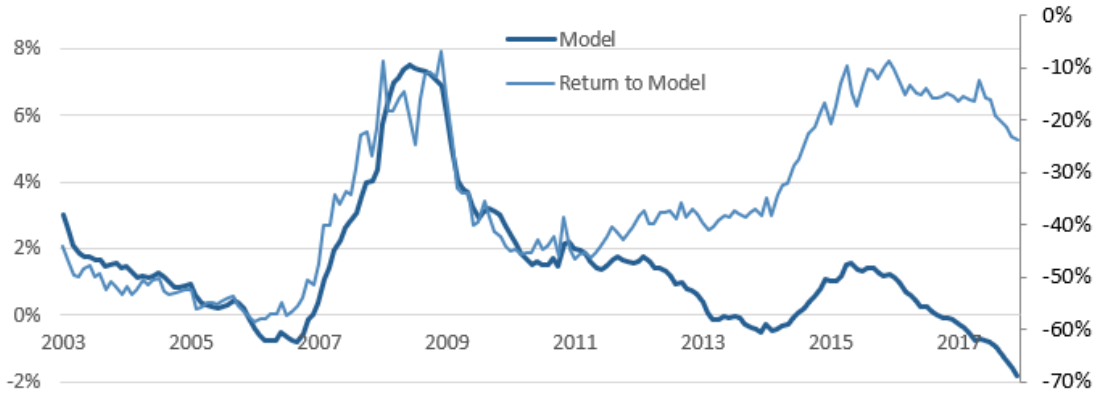
SECTION 3: FUTURE PATH OF THE MARKET (AT 30.09.2018)

Given the model has been using 15-year forward returns, there are 15 years of data[17] for which there is a modelled forecast return, but where only part of the period has completed.

For the period October 2003 to September 2018, one can look at the model forecast and the returns achieved to 30.09.2018 to determine a forecast return for the remainder of each 15-year period commencing in the period of study, under the assumption the model is a best estimate "on the run".

This does not make pleasant reading, as Figure 10 highlights.

Figure 10: Model forecast 15 year returns (LHS) and forecast cumulative returns to model from 30.9.2018



Source: Platinum Asset Management

If the model holds true, from the level at 30.09.2018, the US market appears to offer a negative real return over every time period out to 15 years. That assumes historic relationships between valuation, growth and returns remains intact. While some might argue that the very low interest rate environment is a reason to think otherwise, 10-year bonds were below 3% from 1934 to 1956. The author is aware of John Templeton's famous advice that uttering the phrase "this time is different"[18] is one of investors' biggest errors.

Since July 2017 through to the end of this study, the model has been forecasting increasingly negative 15-year total real returns.

Historically, negative 15-year total real returns were only achieved by those investing between February 1905 and January 1907, from August to September 1929, and from February 1964 to January 1968 (except August 1966). In these periods, the model forecast around 4%, 3% and 1.5%, respectively.

Forecast negative real total returns from US markets has only happened in three previous periods in the study: November 1999 to November 2000 when returns ended up being around 2.5%; and, in the periods for which there is not yet 15-year return data, being September 2006 to August 2007 and from December 2013 to March 2015 (except February 2014).

SUMMARY

To conclude, using earnings yield combined with an understanding of the earnings cycle provides a simple and reasonable starting point for assessing the prospects for real returns from an equity investment. It would no doubt be enhanced by superior analysis.

This makes sense, as starting from the principles of the Gordon Growth Model, one can assess the prospects of an investment by thinking of three components in turn: dividend yield; real growth; and, changes in valuation. One can measure the starting dividend yield explicitly but must explore growth prospects

and valuation risks, to derive an overall assessment of the risk and reward profile for an investment.

Simply put, buying stocks with valuation support and reasonable growth prospects should lead to solid outcomes.

While understanding of the interplay of growth, value and yield provides a framework for assessing investments, the author acknowledges this does not mean it is easy!

ENDNOTES

1. Specifically total real returns.

2. "Index obsession is unhealthy and leads investors astray". An edited version is available.

3. To understand the fundamentals of this company, refer "Samsung Electronics - 20 years on".

4. In practice, an analyst might make adjustments to earnings for accounting items, capital structure, or to smooth earnings throughout the economic cycle.

5. "Gordon Growth Model", *Investopedia.com.*

6. In Credit Suisse's Global Investment Returns Yearbook 2017, Dimson, Marsh and Staunton calculate this as 0.5% p.a. for World markets (in US$) over the period 1900-2016 (p. 34).

7. One can use the term capital expenditure more broadly to include R&D and investment in brand.

8. Fama and French (1992) in *The Cross-Section of Equity Returns* note the absence of reliable book equity data prior to 1962; Branch and Gale (1983) in *Linking Corporate Price Performance to Strategy Formulations*, note market PB ratio fell 2.3 to 1.0 over the 1968-1981 period; and, Branch, Sharma, Gale, Chichirau and Piroy (2005) in *A Price To Book Model Of Stock Prices* note it rose 1.0 to.5.0 over the period 1979-2000. Factset data for 2000-2017 shows it has been in the range 1.5 to 5.6 over this period.

9. Inflation averaged 2.4% over the period 1881 to 2017, but 3.8% over the period 1962 to 2017, according to the Shiller dataset.

10. Each rounded to the nearest full number. Source: U.S. Stock Markets 1871-Present and CAPE Ratio, extracted on 21 September 2018

11. U.S. Stock Markets 1871-Present and CAPE Ratio, downloaded on 21 September 2018.

12. In fact, this study makes a small adjustment to Shiller's work by taking average real earnings over the last 10 years and multiplying it by 1.08. This allows for the fact that the real earnings growth trend has been 1.7% per annum, which is reflected in the 1.08 multiple by moving the historical average to an effective trend earnings at that point in time.

13. Valuation ratios and the long-run stock market outlook

14. The dividend growth is at least a function of growth in earnings, albeit via adjustments in the payout ratio. Note that the correlation of the dividend yield and forward returns is at 52%, equivalent to the relationship between the earnings yield and returns. As payout ratios fluctuate, the paper looks to earnings and its growth as a better representation of the performance of companies.

15. A minor adjustment has been made to the returns equation set out in Section 1. This paper has used growth in earnings of growth in dividend as this removes any change in dividend payout ratio over time and hence ensures that the valuation metric relates to earnings.

16. This makes intuitive sense - 15 years of total earnings are driven by year 1 earnings plus growth, which over time has generally not been a large annual number.

17. US Stock Markets 1871-Present and CAPE Ratio, downloaded on 13 December 2018 for this section.

18. Famous quotes from Sir John Templeton, *Caproasia.com*

ABOUT THE AUTHOR

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