Summaries in Quantitative Finance
No. 5

Valuation Ratios and the Long-Run Stock Market Outlook: A Summary

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Summary of *Valuation Ratios and the Long-Run Stock Market Outlook: An Update*

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Version 1.0.1, last updated on 2016-01-31

This book is for sale at https://leanpub.com/sqf5-campbell-shiller-2001

This version was published on 2023-01-18.

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Abstract

Summary of Campbell and Shiller [2].

Contents

1 Executive summary

The 2001 paper of Campbell and Shiller [2] is a followup of the authors' 1998 paper [1], which was based on a testimony that the authors made before the Federal Reserve Board on December 3, 1996. Over the 1998-2001 interval, the authors also published related papers and books to expand their views, one of which is *Irrational Exuberance* [3].

The main thesis of the paper is that valuation ratios such as price-earning ratios and dividend-price ratios are mean-reverting and can be used to forecast future stock price changes, contrary to the simple efficient-markets models. However, a direct application of this observation is difficult, as the mean-reversion time ranges from one year to twenty years. The paper

- provided several statistical tests to support the main thesis,
- discussed the suitable explanatory variables to use,
- debunked various popular myths along the way, and
- provided results of Monte Carlo simulation to exclude the possibility of "spurious correlation".

As of the paper's publication (April 2001), "the stock market, as measured by the real (inflation-corrected) S&P Composite index, had increased by 80% above its value when we testified [in 1996], and 30% above its value when we published [in 1998]" (page 2). The S&P 50 Index reached its peak of 1527.46 on March 24, 2000 and eventually crashed to its trough of 800.58 on October 4, 2002, while the NASDAQ Composite index reached its peak of 5048.62 on March 10, 2000 and crashed to its trough of 1139.90 on October 4, 2002.[1]

2 The statistical tests

2.1 The intuition

The motivating observation is that valuation ratios, like P/E and dividend yield, are mean-reverting. When stock prices are very high relative to indicators of fundamental value, in order to bring the valuation ratios back to their more normal historical levels, either the numerator or the denominator of a valuation ratio, or both must move in certain direction. Various versions of efficient market models would argue that price changes are impossible to predict. To test this hypothesis, the authors designed several statistical tests to check the predictive power of valuation ratios to forecast either the numerator or the denominator.

The data used is the aggregate annual US data from 1871 to 2000, of which the price data are the January S&P Composite index stock price for each year since 1872, and the earnings and dividends data are for the entire previous year (i.e. 1871-1999). The price index used to deflate nominal values to real values is the producer price index. See Shiller [4] for a description of these data.

2.2 Test 1: Dividend growth rate or price growth rate vs. dividend-price ratio until the next time D/P crosses its mean

Let P_t denote the real January S&P Composite index stock price for year t, and let E_t and D_t denote the real earning and real dividend for the entire year t, respectively. Then the test first studies the linear regression

$$\ln(D_{\tau(t)}/D_{t-1}) = \alpha_d + \beta_d \ln(D_{t-1}/P_t) + \varepsilon_d(t),\ t = 1872, 1874, \cdots, 2000.$$

[1] Data from Google Finance.

6 Conclusion

"The conventional valuation ratios, dividend-price and price-smoothed-earnings ratio, have a special significance when compared with many other statistics that might be used to forecast stock prices. ... These valuation ratios deserve a special place among forecasting variables because we have such a long time series of data on these ratios, and because they relate stock prices to careful evaluations of the fundamental value of corporations" (page 25).

"The very fact that ratios have moved so far outside their historical range poses a challenge however, both to the traditional view that stock prices reflect rational expectations of future cash flows, and to our view that they are substantially driven by mean reversion. ... In this situation a broad judgment of our position in history, of the uniqueness of recent technological advances and investment patterns, and of the state of market psychology assumes more than usual importance in judging the outlook for the stock market." (page 26)

References

[1] John Y. Campbell and Robert J. Shiller, 1998. "Valuation ratios and the long-run stock market outlook", *The Journal of Portfolio Management*, Vol. 24(2), pages 11-26. 4

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