

Reflections on Market Efficiency
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The debate on efficiency of markets has been going on for over a hundred years and stands a good chance of continuing for at least another century. Efficient markets theory embodies a half truth, namely, it *is hard* to consistently outperform the market. But *hard* does not mean impossible, and there will always be interest in discovering inefficiencies. This is in fact, one thing that makes the discipline of finance so interesting. Our field in academic finance has indeed now embraced the role of psychology and sociology of financial markets, commonly now known as behavioral finance. While enthusiasts of machine learning may claim that simple computerized pattern recognition algorithms employed for trading strategies will make markets much more efficient in the future, they will likely miss important regularities if they do not take account of what we know about psychology and sociology.

An often-cited cornerstone in favor of efficient markets is that stock prices roughly track earnings over time, i.e. that over time, asset prices always incorporate best information about fundamental values and that prices changes only in relation to changes in economic fundamentals. However, in my book *Irrational Exuberance* (3rd Edition, Princeton 2015) I showed that since 1871 real stock price through time *did not* correspond well with present values of subsequent fundamentals. Simply put, an unconditional belief in efficient markets is not supported by the data.

The Blossoming of Behavioral Finance

In the 1st Edition of *Irrational Exuberance* published (with some luck) at the very peak of the stock market bubble in March 2000, I argued that a simple feedback mechanism, transmitted by word-of-mouth as well as the media, was at work in producing the bubble we were seeing then. I further argued that the natural self-limiting behavior of bubbles, and the possibility of downward feedback, after the bubble was over, suggested a dangerous outlook in 2000 for stocks in the future.

One might well also presume that for such natural feedback mechanisms, if able to operate so dramatically in periods like tulip mania in 1637 or the stock market boom in 2000, they ought to also recur more often at a smaller scale and to play an important if lesser role in more normal day-to-day movements in asset prices. As such, passively investing into the market portfolio, or so called efficient portfolio, can come with severe limitations and consequences.

CAPE

My work with John Campbell on the Cyclically-Adjusted-Price to Earnings Ratio (CAPE, real price per share divided by ten-year-average real earnings per share) was developed with this in mind, in order to be a relevant feedback mechanism to characterize the strong relationship between an inflation adjusted long-term earnings-to-price ratio and subsequent long-term returns. As a result, it has now become an often-cited measure of equity market overvaluation.

One such reason for this is because of experience: In December 1996, John Campbell and I presented empirical evidence to the Board of Governors of the Federal Reserve (Shiller [1996]), that historically on average when the CAPE ratio for the US market has been high, subsequent 10-year returns have been low or negative, and vice-versa. At that time we expressed concern that prices were becoming high relative to earnings – a warning that was well served given the subsequent bursting of the technology bubble in 2000.

Table 1 (reproduced from Shiller & Jivraj [2017]) shows this very distinct relationship: The average of ten-year forward returns decreases as the starting value of CAPE increases, with both worse and best cases getting weaker.

¹ With assistance from Farouk Jivraj, Barclays.

Critics will point to the large standard deviation of the realised returns in each decile, highlighting an important caveat: There are occasions where CAPE has been incorrect in forecasting subsequent ten-year real returns. Nonetheless, with such a clear and distinct relationship, a starting CAPE value in the 30s is still concerning for investors looking at US equity markets, whereby historically, at such a starting level, by deciles, we're in the worst possible bucket where on average subsequent annualised real returns over the next ten-years were a mere 0.9%, with the best case being a not so bad 5.8% but the worst case being a very bad -6.1%.²

Table 1: S&P 500® 10-year forward annualised returns from different starting CAPE ratios, Q1 1926 – Q2 2017

Starting CAPE ratio			Real 10-year S&P 500® Ann. Returns			
Average	Low	High	Average	Worst	Best	Std Dev
8.6	5.6	9.6	9.8%	4.2%	17.2%	2.2%
10.3	9.6	11.0	10.6%	3.8%	16.9%	3.4%
11.5	11.0	12.1	10.0%	2.6%	14.7%	3.4%
13.0	12.1	13.9	8.7%	0.7%	14.1%	3.7%
15.0	13.9	16.1	7.8%	-1.6%	15.0%	4.9%
17.0	16.1	17.8	5.4%	-3.8%	14.6%	5.4%
18.7	17.8	19.9	5.0%	-4.0%	13.5%	4.2%
21.0	19.9	22.0	2.7%	-3.3%	8.6%	3.9%
24.1	22.0	26.4	2.5%	-4.0%	7.3%	3.6%
33.2	26.4	44.2	0.9%	-6.1%	5.8%	3.4%

Source: Barclays and robertshiller.com¹

Implications for Single Stock CAPE Investing

Intuitively, these same behavioural mechanisms which work at a market level can also be applied at a security level, especially to form valuation comparisons across stocks, now well-coined as value investing. While there are numerous approaches to form such portfolios of stocks that are underpriced by some value measure, on the theory that they have been overlooked only temporarily by investors and will appreciate eventually; with the other side of this strategy being to sell overpriced stocks short. The use of CAPE may allow for an important behavioural channel in the approach to compare valuations between stocks.

It should also be noted that while valuations for the US market as a whole appear high as of this writing, this does not mean that the effect of value on return across stocks will be diminished. There are different dimensions to value investing. Arguably, investors who passively follow markets without any active input are simply ignoring decades of financial science, including any insights from the use of the CAPE ratio. This is particularly true when applying CAPE at a single stock level: The denominator of the CAPE ratio is a ten-year average of real earnings and many individual companies may not even have ten years of earnings history, or much of the past ten years was in a startup phase for the company when earnings were nonexistent. Thus, the application of CAPE to single stocks is only sensible for established companies, otherwise known as, “old standbys,” i.e. companies with a long earning history.

Such an approach, while systematically employed, is an active form of investing. We're picking stocks based on the relative comparison to other stocks. Through the use of CAPE, such a strategy has a good chance of consistently outperforming the market year after year since it relies on a lot of individual-stock “bubbles”, that arise and burst independently of each other. Investors might be hot on Apple today, on Pfizer the next year, and on General Motors the year after that. Thus, if you systematically and consistently go into the low-CAPE individual stocks, i.e. the forgotten steady earners, and diversify across sectors, the strategy will be exposed to many independent and different “bubble” through time, which should average out to superior returns in the long-run.

Of course, market efficiency has a critical role to play in all of this and the bursting of these independent bubbles.

² Table 1 is the compilation of the ten-year forward real returns of the S&P 500® over every possible rolling decade since 1926 for different starting CAPE ratios and is then separated by deciles.