



LSR View

S&P NOT HEAVILY OVERVALUED

Charles Dumas

- **As a measure of over/under valuation, a ratio must revert to mean, long term**
- **The 1914-91 'short 20th century' distorted CAPE and price/book ratios down**
- **The S&P real value index has 6.6% pa real total return and reverts to mean**
- **The RVI, now 16% overvalued, could get more so before it falls back**

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Summary

We have been bullish on US equities in our Asset Allocation since late-summer 2016, the end of a two-year pause in the market. The S&P 500 has risen by 27% since then. Last autumn some clients became concerned about overvaluation, contributing to the current selloff. But we remain bullish. US equities are so far only modestly overvalued, and likely to be more so in 2018. We are sceptical of some popular valuation models. This LSR View looks at the cyclically adjusted p/e ratio (CAPE), the price/book ratio (Q) and the S&P real value index that tracks total real returns.

For a market ratio to indicate over- or under-valuation, a key feature is that it reverts to mean. Using Professor Shiller's S&P data since 1871, we find the CAPE does not revert to mean. It did in the 'short 20th century', 1914-1991. Its succession of WW1, the Great Depression, WW2, and the Great Inflation, occurred against the backdrop of the threat of private property expropriation under the alternative political system, Communism. The end of the Cold War rightly initiated an increase in the CAPE to radically higher levels; the passage of only 27 years is not enough to judge the new correct level, because equity-market long-cycles last more than 30 years.

The market's price/book ratio is subject to the same weakness as CAPE, though it has risen gradually vis-à-vis CAPE over time. Only the S&P real value index (RVI) reverts consistently to mean over 1871-2018, with a real average annual total return of 6.6%. This reflects the fact that its progress is largely an internal US function of the interaction of the desires and fears of US investors and the behaviour pattern of US business managements. The RVI is now 16% above its long-run trend. Over 2018 it could move higher, but in the medium term (3-5 years) it could fall back to, or below, trend as we expect real bond yields to become less depressed.

Introduction – the need for reversion to mean

It is a commonplace to read that US stock market valuations – basically p/e ratios – are over-stretched or simply too high. The implication is that stocks will offer inadequate returns in future.

Sometimes such an assertion is backed up by a survey of the historical cycles of the p/e ratio. A layer of sophistication can be added by using the long-run market data developed by Professor Robert Shiller of Yale, going back to January 1871. These can then be adjusted to exclude inflation effects on both stock prices and earnings. Using a cyclically corrected, period average for real earnings should then give a good measure of the level of the market relative to profits.

An alternative ratio for stock market prices compares them with the book value of firms. This can be done individually for each firm, and collectively for sectors or the aggregate market, much as can be done for the p/e ratio. Over the long run, in a perfect market, this ratio should average '1' or 100%, since deviations on the upside should induce capital spending that introduces more capacity, eroding the value of shares in existing capacity – and *vice versa*: a price/book ratio of less than 1 should render capex uneconomic compared to buying existing shares in the market. As we shall see, this perfect-market result has not occurred in reality.

A third approach to assessing value is to examine the real total return – the inflation-adjusted change in stock price plus the dividend yield. If investors' desire for return in relation to risk is relatively stable, this return should show long-run stability.

Other criteria can be used in M&A deals and sector analysis, as well as individual stock evaluation, but are less useful for the purposes of this LSR View, which is about valuation of the entire market. For example, the analogy to the price/sales ratio for the entire market would be the total market value relative to GDP, GNP, or net national product. But with most markets having extensive international investment interests, this is inapplicable. Likewise, price/EBITDA may be useful for comparisons with other companies in a sector in an M&A context, but for the market as a whole it should not add anything to the p/e ratio as a long-run analytical tool.

In looking at the three criteria accepted above, the cyclically adjusted p/e ratio ('CAPE'), the price/book ratio ('Q'), and the real total return, the search is for a criterion that reverts to mean. Only with such reversion in the past can the criterion guide us as to what to expect in the future.

CAPE, theoretically strong, does not revert to mean

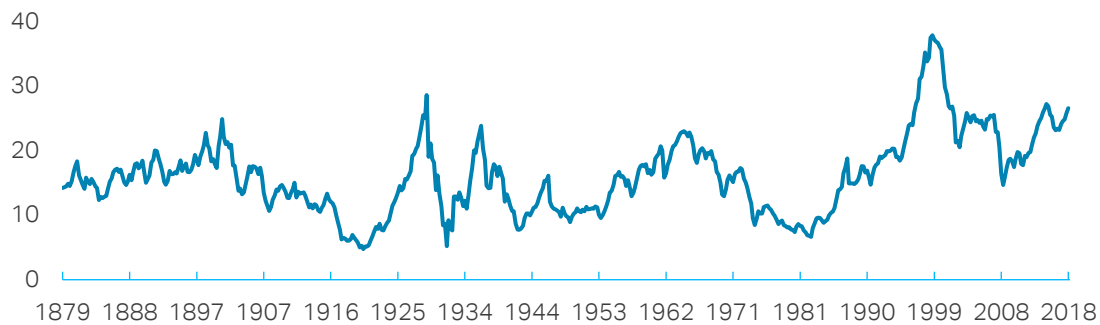
CAPE is a widely broadcast criterion for valuing the market, based on the work and theories originating with Professor Robert Shiller of Yale University. CAPE uses a period moving average for earnings, thus achieving cyclical adjustment, and excludes distortions arising from inflation.

The US economy had peaks preceding recessions in 1968, 1973, 1979, 1989, 1999, and 2007. Five cycles in 39 years means an average 8-year length of cycle, though they have varied from five to ten years in length. The cycle of hourly productivity growth indicates the same length, though with different peaks and troughs. Here we use 8-year moving averages to approximate a cyclically adjusted series, but we have checked the results by examining the 10-year alternative.

Professor Shiller's use of 10-year moving averages for cyclical adjustment may simply be a convenient round number. It fits less well the cycles of the US economy and makes the numbers less up to date. Any moving average over-weights the earlier data at the expense of the later. It is best to go back only as far as necessary to minimise cyclical effects. The level of the S&P index and the S&P index earnings are 'real' levels through deflation by the US CPI. Our CAPE consists of the current real S&P index price level divided by the annualised average of the real earnings of the preceding 32 quarters (eight years). Whereas the price is the latest, therefore, the earnings used as denominator in effect relate to 4 years ago, the mid-point of the moving average.

The utility of CAPE for assessing whether stocks are overvalued or undervalued depends on whether it reverts to mean. Devotees of CAPE as a criterion of value generally maintain that its very high level for the S&P 500 over the past 20 years indicates an overvalued market that must eventually fall back hard. This could well prove true in the very long run, but it has weakened the attention of market professionals to CAPE, as this conclusion is frequently used to support pessimism over much shorter time-periods. For these the average of experience over the 140 years since the 1870s is barely relevant – for reasons we identify below.

US S&P CAPE w. 8-yr moving average 'e'

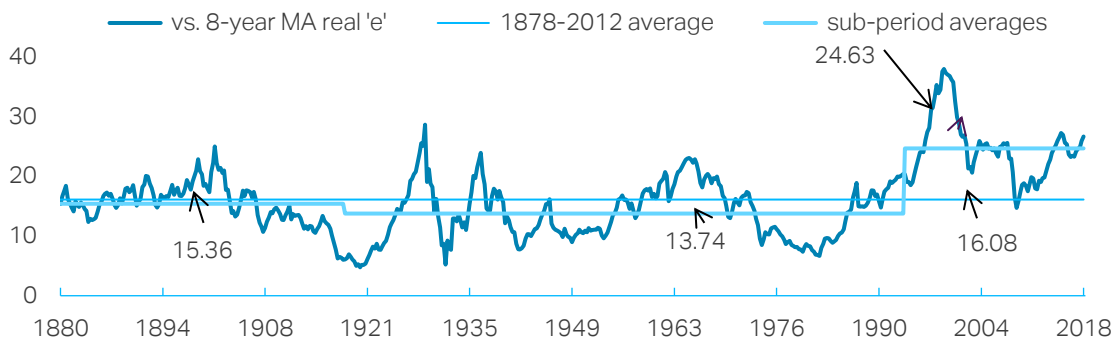


Source: Prof Shiller, Datastream, TS Lombard

The analysis below uses history to suggest sub-periods that can justifiably be used to examine the CAPE as a ratio that reverts to mean. History and economics are not easy bedfellows, perhaps for temperamental reasons. History tends to be concerned with the specific, economics with aggregates and averages. The kind of person well suited to each tends not to be well suited to the other. But the period since 1871 approximates to the whole period of *post-bellum* US capitalism, as the civil war ended in 1864.

The chart above shows the CAPE since the late 1870s without long-run period averages. (With an 8-year moving average, the earliest plot could be 32 quarters after 1871 Q1, ie, 1878 Q4.) In this 140-year history, it is hard to discern by eye a clear mean around which it fluctuates. What can be seen is a relatively steady improvement in the late 19th century, which then went into drastic reverse until 1921, a few years after the First World War. The surge of the 1920s quickly collapsed after 1929, and the 1901 peak was not matched again until the tech bubble of the late-1990s, though the mid-1960s peak came close.

US S&P CAPE w. long-run & sub-period averages



Source: Prof. Shiller, Datastream, TS Lombard

The history of CAPE is easier to represent if the 135 years outlined above are divided into three periods: pre-WW1, the “short 20th century” (1914-90), and post-Cold-War. To help visualise this,

the chart can be adjusted to run from 1879 to half a cycle-length (16 quarters) after the start of WW1 in 1914 Q3, i.e., 1918 Q3; from 1918 Q4 to half a cycle-length after the “fall of the wall” in 1989 Q4, i.e., 1993 Q4; and from 1993 Q5 to the latest quarter, 2018 Q1. (This mimics the effect of plotting the moving average at the centre of each 7½-year period, rather than the end-point, but the latter conforms more to market convention.)

The three periods chosen here make good sense from the point of view of different appropriate market risk premia, the natural cause of variations in CAPE. The end of slavery in the mid-1860s inaugurated full-blown, continent-wide, modern capitalism in the United States. Aided by the developing boom in Europe from the 1880s, the period to 1914 saw globalisation and rapid growth. Tensions that erupted in the First World War were increasingly in evidence in the early 20th century and might be held (partly) accountable for the worsening of the CAPE after 1901.

Viewed in these separate historical periods, the CAPE can be much more readily seen to reflect their different circumstances, rather than to revert to mean. Prior to WW1, it averaged 15.36, not much different from the 135-year average of 16.08. But it is by no means a stretch to imagine, by way of counter-factual, that had not European governance been so riddled with antagonism, anachronism and incompetence the economies would have continued their impressive upward progress, and the CAPE with them. As the CAPE peaked at just under 25 in 1901 Q2, continuance of ratios at or close to this level would have raised substantially the period-average from 15.36.

From WW1 to the end of the Cold War, CAPE averaged significantly less at 13.74, and the market ranged around this average roughly evenly, and widely. Since the end of the Cold War it has averaged 24.63, and the market has completed less than one complete cycle around this average – if, indeed, it is cycling around this (or any other) average. The strong, nine-year recovery from the stock market’s post-GFC low point has brought the CAPE now to 8% above the post-Cold-War average.

The short 20th century was plagued by WW1, Great Depression, WW2, the Cold War, and the Great Inflation. The 13.74 average of CAPE over its 75-80 years reflects this serial strife. Important in the background was the intense competition between communism and fascism – and later between communism and capitalism – with the underlying threat of expropriation by socialist policies. Even in the anti-communist US, this significantly increased the perception of stock-market risk in the short 20th century, which covers more than half the post-1871 Shiller data on the S&P index.

It is reasonable to look at the chart above for the short 20th century only, and to perceive a reversion to mean around the 13.74 CAPE average. But whatever the future holds, a substantial period will be needed to permit any serious attempt to discern a new mean to which the CAPE might revert. The equity market cycle averages more than 30 years in length, and we have only had 27 years of the post-Cold-War era. Francis Fukuyama’s famous pronouncement that 1989 (or the demise of the Soviet Union in 1991) represented the end of history is embodied in the high post-Cold-War average for the CAPE. But can it last?

The argument here will be that it is unlikely to last in the very long run but may well last for the medium term, which could itself last surprisingly long. The very long-run point is that the sort of troubles that plagued the short 20th century – WW1, Depression, WW2, the Cold War, and the Great Inflation – are likely to recur, if in very different guise, in future. History has not ended. Whether it be pestilence, war, famine or death, one or more of the four horsemen will probably disturb our futures, just as they have throughout much of history. But there is no way of predicting what the nature of such a future upset to the market’s current relatively benign orientation may be; whether it would/will be as bad or even worse than the short 20th century; and when such future bad times are likely to start (if they have not already).

Four chief reasons why a higher CAPE than in the past might persist in the medium term are:

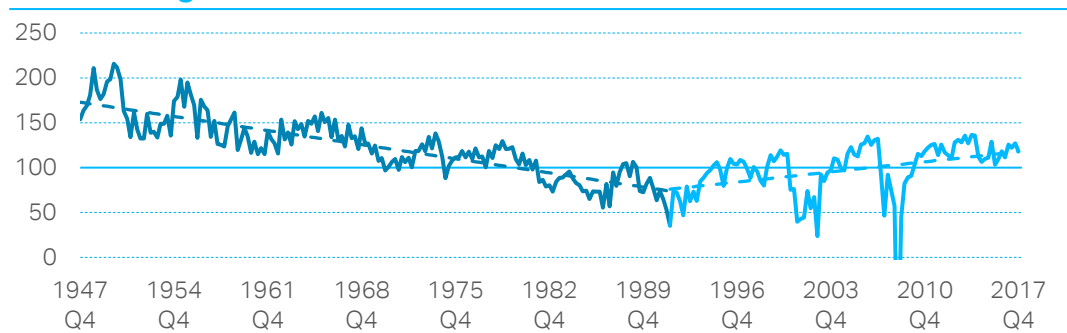
- A much-reduced perception of risk, on the assumption that damage to profits and destruction of assets by war, the Cold War, the Depression and the Great Inflation are less likely than the past
- Associated with this, at least in advanced countries, and also many emerging markets, the end of widespread belief in socialism and its propagation as an alternative to capitalism or the European-style mixed economy
- Over the Cold-war period, whether or not coincidentally, the ratio of S&P earnings to US GDP was on a significantly falling trend, but since the early 1990s it has been rising, though so far only to the 1970s level, suggesting some possible further upside scope as (and if) non-US economies, especially EMs, grow faster than the US
- More controversially, the global glut of savings, and consequent low return on capital and real interest rates, raise the capital value associated with a given flow of income from capital. Where that income is judged reliable, the p/e ratio is therefore higher.

Do these factors make the much higher CAPE of the past 20 years a 'new normal'? At least in the context of the US economy, this would appear to true for the time being. In the nine years since the market's post-crisis low point, the dollar has been both seriously undervalued (2011-13) and overvalued (2015-16) without preventing a relatively high CAPE.

Examining the first two factors above, no major nation is seriously pursuing an anti-capitalist economic policy. The genuine danger of depression after the GFC was averted by aggressive stimulus policies. Though these policies led to a hangover of weak medium-term growth once governments pared back deficits, stock market recovery has not been inhibited. Meanwhile, not only are authorities in most of the world vigilant about inflation, but global economic weakness has made deflation a more important threat.

When it comes to actual wars, of a kind that could present a broad threat to major stock market valuations, prediction is obviously impossible. There are flash points in North Korea, the Middle East, and underlying tensions between China and Japan, and India and Pakistan. The main point is that the markets are unlikely to anticipate a conflict on such a damaging scale until it is close at hand or actually happens: flash points now are very different from those that might have been named just a few years ago. The *Pax Americana* looks a lot less solid than in the 1990s, but stock markets are unlikely to slump politically to much lower valuations without a major war.

S&P earnings vs. US GDP, 1991-2017 av. = 100



Source: Standard & Poor's, Datastream, TS Lombard

The chart above simply shows the relationship of the S&P index earnings to US GDP, indexed to the average since the end of the Cold War in 1991. Whether because of the Cold War or for some other reason, the trend of earnings was much weaker than GDP from WW2 until 1991, and

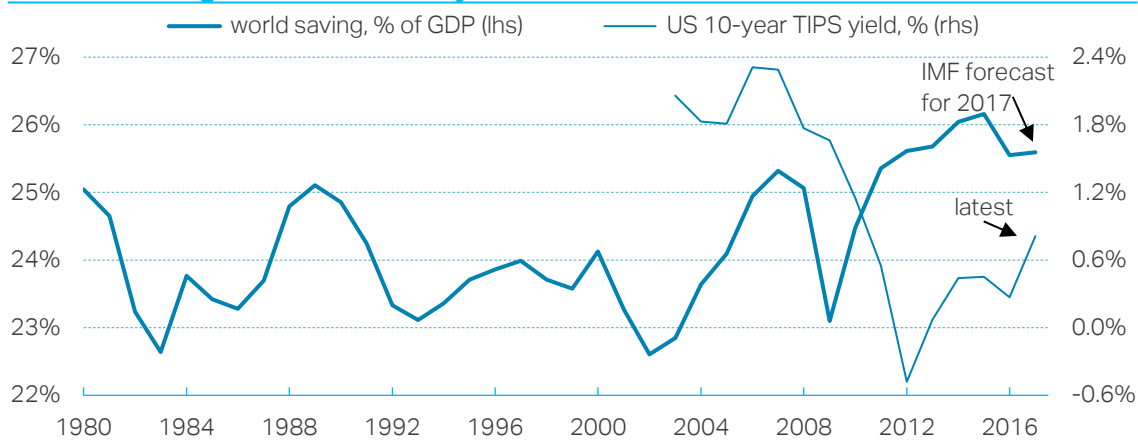
has been stronger since. The upward slope of the trend-line since 1991 is less steep than the prior downward slope. But the change of trend clearly pivots round 1991, even though both the 2001-02 bear market and that of 2008-09 yielded massive dips in earnings vis-à-vis US GDP. (In 2008 Q4, S&P earnings were heavily negative, the only negative reading in the past 70 years.)

Why is there such a change of trend? The end of the Cold War is also a cause of this, but the effect is indirect – unlike the political risks to capital noted above. The end of Communism – explicitly in the Soviet Union, implicitly in China (in the sense of communism as rejection of market forces) – turned the world into a globalised economy. As well as the former Comecon and China, this affected India and south-east Asia. They had been heavily influenced by Socialist thinking after post-WW2 decolonisation. Globalisation of the world economy followed and this helped US corporate earnings reverse their previous falling trend vis-à-vis GDP.

Quite apart from any other factors, this shift in the trend of earnings vis-à-vis US GDP is a good reason for investors to like US stocks and raise the long-run p/e ratio of the US market. Prior to 1991, the growth of earnings was weaker than that of incomes generally – subsequently it was stronger. Clearly this justified a higher market rating. Whether such a higher rating would actually occur depended in part on the flow of funds.

Globalisation did not just affect the 'e' in the p/e ratio. It also increased radically the range of investors able and desiring to invest in US stocks. For this the impact of the savings glut was important. A large excess of private saving over useful – that is to say, profitable – capex opportunities had already been prevalent in 1980s Japan, well before the end of the Cold War. This led to large overseas surpluses and an appetite for foreign assets, typically in America, though Japanese investment there did not always turn out too well.

World saving & US real bond yields



Source: IMF, Bloomberg, TS Lombard

Other countries came to share this tendency to save too much. The development model based on export-led growth with a competitive currency and high savings, started by Germany in the 1950s 'Wirtschaftswunder', proved a successful mode of catch-up for development. As well as by Japan from the mid-1950s, it was shared in the 1980s by some of the Asian Tiger countries, such as Korea, Hong Kong and Singapore. They became convulsed by overheating and the Asian crisis in the 1990s, but emerged chastened from that saying (in effect) 'never again'. They earned giant surpluses after 1999 that required investment abroad, again typically in America.

From 1999 onward as well, the divergent inflation and growth rates inside the newly minted euro area caused Germany and the countries round it to rejoin this saving glut tendency. (Germany was driven mostly domestic demand in the 1990s, reflecting East German reunification.) The

combined economies of Scandinavia, Benelux and Switzerland-Austria had a GDP equal to Germany's, and a current account surplus likewise. Until the 2008 financial crisis these surpluses were offset within Europe by deficits in Mediterranean Europe, Britain and Ireland, but the investment of their surpluses took in a lot of US assets, and not just the notorious subprime CDOs. After the crisis, as the euro crisis hit, the EA deficit countries were forced into balance but the German-centred surpluses stayed. So the EA as a whole became an exporter of capital.

Lastly of course China, saw its national savings rate mount to 50% of GDP by 2007, remaining at or close to that level ever since. Although capex rose to extravagant heights, so did foreign exchange reserves that to a great degree found their way to the US. Private capital outflows also played a major role in the 2013-2016 period.

The world savings rate has thus risen to record levels at a time when the slower growth of population arguably should have reduced global capex ratios. But world saving and capex are equal – by definition. So the savings glut has expressed itself until recently in deficient demand and lower interest rates. The latter are caused both by weak demand and by a low return on capital as excessive saving chases less profitable capex opportunities to 'use up' the excess savings (much of which in effect got wasted in China, where the savings rate is most excessive). Low real interest rates have led to high valuations of existing assets, as the bar is set lower in the 'stocks v. bonds' decision.

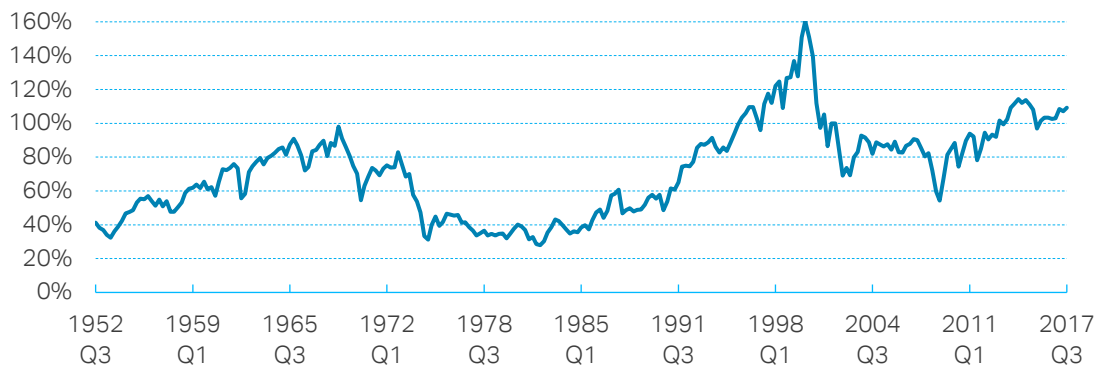
There is some argument that this effect could wear off in the very long run. First, the infusion into the global market place of China, India, ex-Comecon and 'Communist' south-east Asia effectively raises the population of countries participating in it from about one billion to four. This huge expansion of the labour force was initially not matched by corresponding amounts of capital. To some extent this justified the extravagant capex habits induced by the glut of saving. More importantly it also raised automatically the earning power and value of existing assets. This process blew itself out in 1990s with the Asian bubble-bust followed by the tech bubble-bust in America. The CAPE levels recorded then may well prove to have been a one-off. In that case the average CAPE that may emerge over time could be lower than the 27-year, post-1991 level.

Another effect of the dramatic increase in the supply of labour, versus capital, was that labour was substituted for capital in a whole range of ways, off-shoring being the most obvious. As countries with the freshly employed labour continued with their high savings habits, new ways had to be found to 'waste' the savings with dubious capex. In the run-up to the financial crisis it was US housing and debt-driven extravagances in the likes of Spain, Portugal, Greece, the UK, Ireland, Australia, etc. In the dismal 2010-15 recovery stage it was primarily debt-driven capex in China and budget deficits in Japan, often with a return to the late-1990s wasteful infrastructure. This tendency used to be justifiably lampooned by phrases such as 'bridges to nowhere', 'vegetable airports', and (most pointedly) 'paving Mount Fuji'.

The effects of broad global competition for business remain, however, and this has held down wage gains in the much more soundly based expansion of the past couple of years. This is therefore a further factor boosting earnings and the value of stocks, and with that the CAPE. On the other side of the coin, the savings glut itself seems likely to be in long-run shrinkage, though not in a 'straight line'. If this is true, then in line with the improved and less unbalanced growth prospects for the world economy, real bond yields should move higher. Eventually that should sap stock market ratings. But first we need to examine the two alternative valuation criteria to CAPE, namely the price-to-book ratio ('Q'), and the real value index (RVI).

Price/book ratio, 'Q', has the same weakness as CAPE

'Q': US NFC price/book ratio

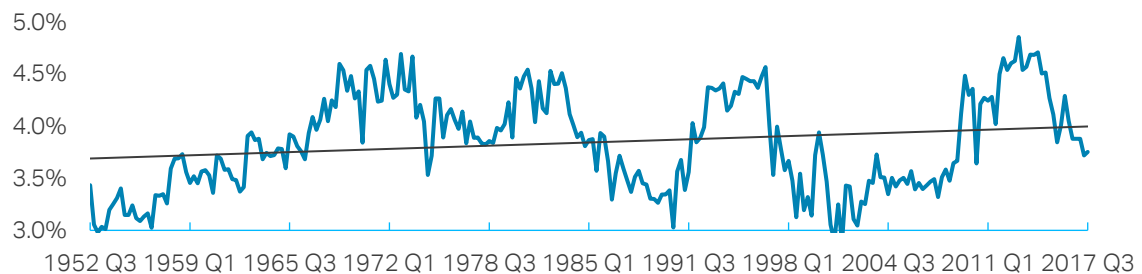


Source: US Fed, Datastream, TS Lombard

The chart above shows the market value of the shares of the US non-financial corporate sector as a percent of book value, taken from the relevant tables on non-farm, non-financial corporate balance sheets in the US Fed's quarterly Flows of Funds data. This series has been estimated back to 1900 by Stephen Wright of Birkbeck College, London University. But although his estimate of the 1929 ratio rose to 120% for just that year, it in no way matched the heights of 1999. And the pre-WW1 ratio roughly matched the 1960s peak of around 100%. So if one credits the average in the above chart of 72% as a mean ratio to which the price/book ratio should revert, then the market was 52% overvalued in 2017 Q3, the latest reading.

It is hard to credit the idea that a price/book ratio of 109% is major overvaluation. In theory, the ratio should be 100% on average over time. Much of the balance sheet data the Fed provides is also suspect. The most natural adjustments would reduce book values, as some of them correspond to 'assets' are not tangible. This might bring the long-run average closer to unity. But much more serious is the concept that book values, which largely reflect tangible assets, are not a true measure of the capital of any company, such as in service industries, whose activities are generally based on intellectual property or brand franchises.

'Q'/CAPE ratio w. trendline



Source: US Fed, Prof. Shiller, Datastream, TS Lombard

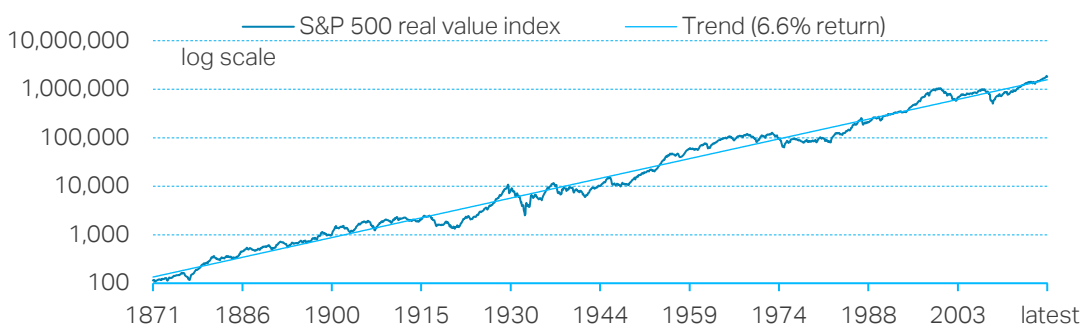
The US authorities have started to tackle this problem with recent back-revisions of the national income data. But it is unlikely that this will fully put onto balance sheet the intellectual assets and other franchise values. For example, pharmaceutical companies spend large sums on advertising that improves their sales and profits, to the benefit of the firm's shareholders. But as advertising costs are expensed in the P&L accounts, this value does not appear in book assets. So the conclusion about the market being overvalued on this measure is open to doubt. The key point is that it is in pure service businesses that the book value is least likely to reflect the

inherent value of the firm – the 'brand', if you like – and such businesses have become an increasing proportion of the economy over time. This implies a rising price/book ratio vis-à-vis CAPE (for example) as shown in the chart above, whose upward trend is statistically significant.

A 'Q' that is averaging well below 100% implies the existence of some threat to the earning power of firms' assets. It is thus just as likely over the long run to have been artificially depressed during the short 20th century as CAPE, and for the same reasons: WW1, Great Depression, WW2, Great Inflation, and the general threat of expropriation if communists achieve power. The fact that its level during the short 20th century averaged so far below the natural level of 100% is in itself evidence that stocks were fundamentally undervalued in that period, corroborating the conclusion from CAPE analysis.

S&P real value index (RVI) does revert to mean – is now 16% above trend

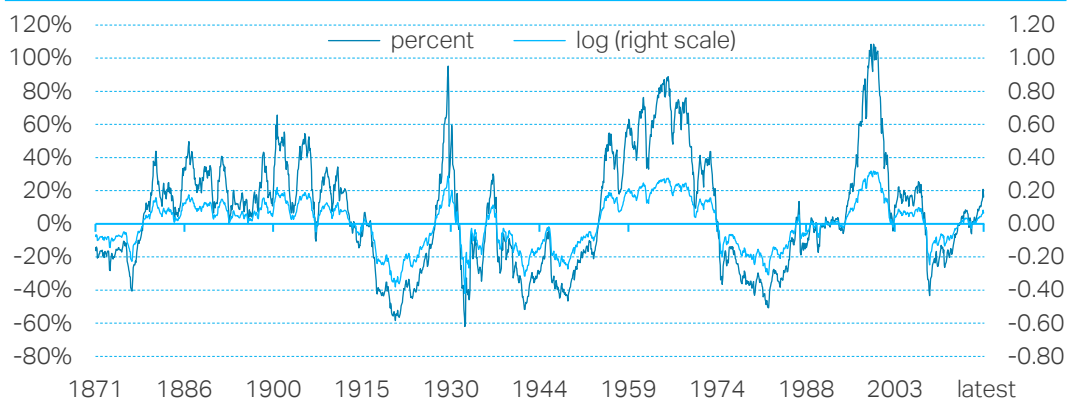
US S&P real value index, Jan-1871 = 100



Source: Prof Shiller, Datastream, TS Lombard

The last long-run valuation criterion of chief interest is the relationship to its trend of the S&P real value index (RVI). The RVI is the S&P index (from 1871, as used for the calculation of CAPE above) with dividends re-invested and corrected for CPI inflation. It is extraordinary. It has increased more than 18,000-fold over the past 147 years, with a 6.6% annual average annual real yield that has been remarkably steady – at least for those of a historical bent who are not fazed by an average cycle-length of about 30 years. The first chart above shows its progress on a log scale, in which format the relatively consistent rate of growth is shown by the RVI's clinging to the straight-line representation (in log form) of the 6.6% trend of the total real return.

Deviations from trend of S&P RVI



Source: Prof Shiller, Datastream, TS Lombard

This second chart shows the deviations of the RVI from its trend, on a percentage basis for ease of comprehension, and a relatively purist log basis to show the symmetry between the upsides

and the downsides. The highs for the RVI's deviation, 1929 and early 2000, for example, are about twice the trend (100% up) and the lows, eg 1921 and 1982, about half it, 50% down. So the factor of two defines the historic scope of deviations. This is remarkable in an index appreciating by more than 18,000 times over 146 years.

This puts in context the booms and busts of the market. Over any extended timescale an investment in stocks has far surpassed anything else in total return, including houses, real estate generally, and certainly bonds. It is true that the real return between for example the 2000 RVI peak (in August) and the 2007 peak (in October) was minus 4% as the deviation went from plus 104% down to plus 24%. The nominal level of the index was actually up a little over this period, but the dividend yield fell short of inflation by enough to make the total real return negative. Even so, by 2007 the upside deviation was less than a quarter of the 2000 peak, owing to the cumulative force of seven years of 6.6% gains in the trend-line.

Stock market gurus may tell you that there is no reason for this RVI to revert to trend. But when something does revert to trend so consistently – and we at Lombard Street Research have used it effectively to forecast major turning points over the past 15 years – it is reasonable to say that the job of the analyst is to develop an explanatory theory. The absence of such a theory would show weakness.

It seems that the predictive power of the RVI lies in the fact that it represents the interaction of US investors with US business managements, and that appears to have remained consistent over time, in terms of management's behaviour (typically concerning capex) operating to erode shareholder value when the RVI has had a period of above-average returns; and *vice versa*.

This behaviour pattern is clearly predicated on US habits and attitudes, but a similar long-run pattern has prevailed in Britain since just after WW1 (as it did before WW1, which imposed a major one-shot downside break that was not seen in WW2). The total real return in the UK has also been similar to the US, though post-WW2 analysis for Germany and France along the same lines shows somewhat lower total returns.

At the current S&P level of 2678, the RVI is 16% above trend. This is high-side, but not massively so. Given the relatively disappointing performance of the economy in the post-crisis period, both globally and in the US, the chief explanation for an above-trend S&P RVI has to be the low real interest rates, reflecting the global savings glut (chart on p.6). The average 10-year TIPS yield of the past several years has been well under ½%, so that after deduction of the cost of a 10-year US CDS contract the risk-free real return on capital has been roughly zero. The current market p/e ratio of 22 or so gives an earnings yield of 4½% that compares quite favourably with this.

For the future, we expect rising real yields in the TIPS market to be reflecting both the current cyclical strength of the economy, and over time a shrinkage of the global savings glut, most notably in German-centred Europe, which is responsible for half the global glut (\$550bn a year out of a \$1.1 trn total), but also probably in China and possibly some Asian Tigers.

With US real interest rates still well below long-run – or 'neutral' – levels, and European rates spectacularly so (likewise, Japan), the combination of strong growth and easy money should boost the market significantly in the short term. The chief variant to our bullish 6-12 month forecast would be upside – a bubble – not the downside risk of the market topping out.

But over the 3-5 year medium term, a lesser global savings glut and good medium-term economic prospects should restore real 10-year TIPS yields towards their long-run average of about 2½% (though probably not reaching it). By the time that has happened, the S&P RVI could be back at or below its long-run trend. Note though, that over five years a 6.6% trend rate of return raises the trend level by 37½%. So stock market returns could stay positive, though below-trend.

Author



Charles Dumas
Chief Economist