

Predicting Stock Market Returns Using Shiller-CAPE And PB

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by: Norbert Keimling

Summary

- Shiller-CAPE and price-to-book ratio enable reliable forecasts on subsequent stock market returns.
- In countries with structural breaks, price-to-book ratio even exhibits some advantages compared to CAPE.
- Long-term market potential based on findings: US 4.3%, Europe 8.0%, and Emerging Markets 8.4%.

Over the past 100 years, investors in US stocks have been able to realize real capital gains of around 7% per annum. No other asset class - neither bonds, cash, gold nor real estate - has offered comparable return potential. Nevertheless, stock markets are subject to very strong fluctuations, and the achievable returns largely depend on the time of investment. Thus, the question for investors is how they can most accurately forecast long-term stock market developments.

The standard approach - forecasting a company's earnings development based on the economic development of a market and using the resulting stock market valuation to forecast the short- to medium-term stock market performance - is rarely successful in practice. At best, economic developments can only be estimated roughly. The earnings growth of internationally-oriented companies is more and more decoupled from the economic cycle of their countries of origin, and short- to medium-term earnings growth correlates only very weakly with stock market developments. Unforeseeable developments such as terrorist attacks, oil price shocks or central bank statements, and the resultant market sentiment have a much greater impact on capital market developments in the short to medium term than calculable fundamental data.

Traditional price-earnings ratios are unreliable

Given this fact, valuation metrics such as the commonly used price-to-earnings ratio (PE), which looks at a market's corporate earnings in relation to current market prices, would not provide a reliable correlation to the next year's stock market earnings even if it were possible to make an exact forecast (Figure 1). Rather a pity, given the hordes of analysts who compete on a daily basis to get the most accurate earnings forecasts!

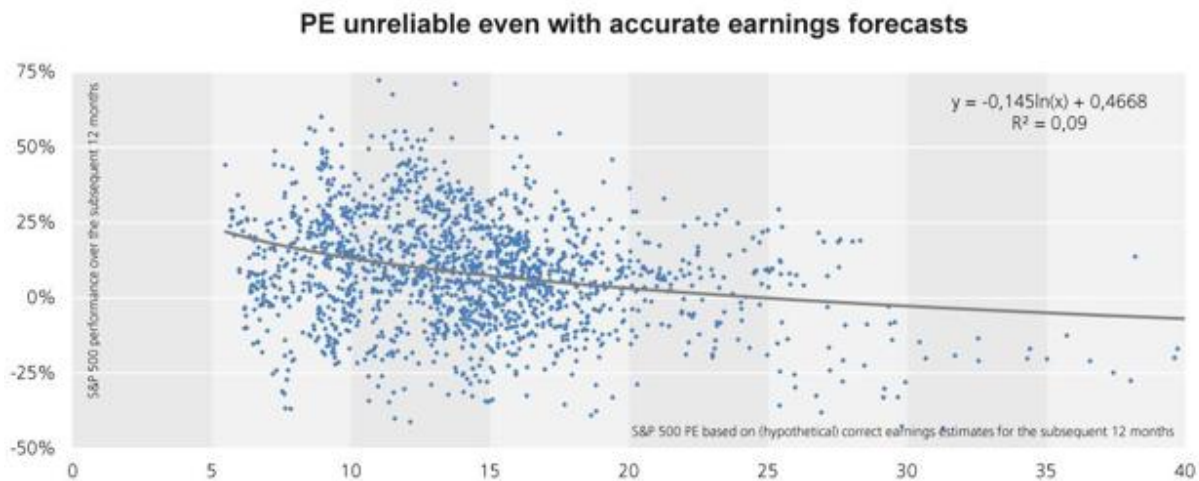


Figure 1: Relationship between PE, using correctly forecast earnings for the following year, and the real S&P 500 Performance Index in USD for the period 01/1871-04/2016. Source: Shiller, StarCapital.

There are also two reasons why classic PE is of almost no use in long-term forecasting. On the one hand, corporate earnings are extremely volatile - in practice, they can at best be predicted roughly. S&P 500 earnings, for example, fluctuated between 7 and 77 points between 2009 and 2010 (Figure 2). Thus, the level of profit in any one year is not necessarily representative of the future development.

S&P 500 earnings growth since 1871



Figure 2: Inflation-adjusted earnings of S&P 500 companies from 01/1871 to 04/2016. Source: Shiller, StarCapital.

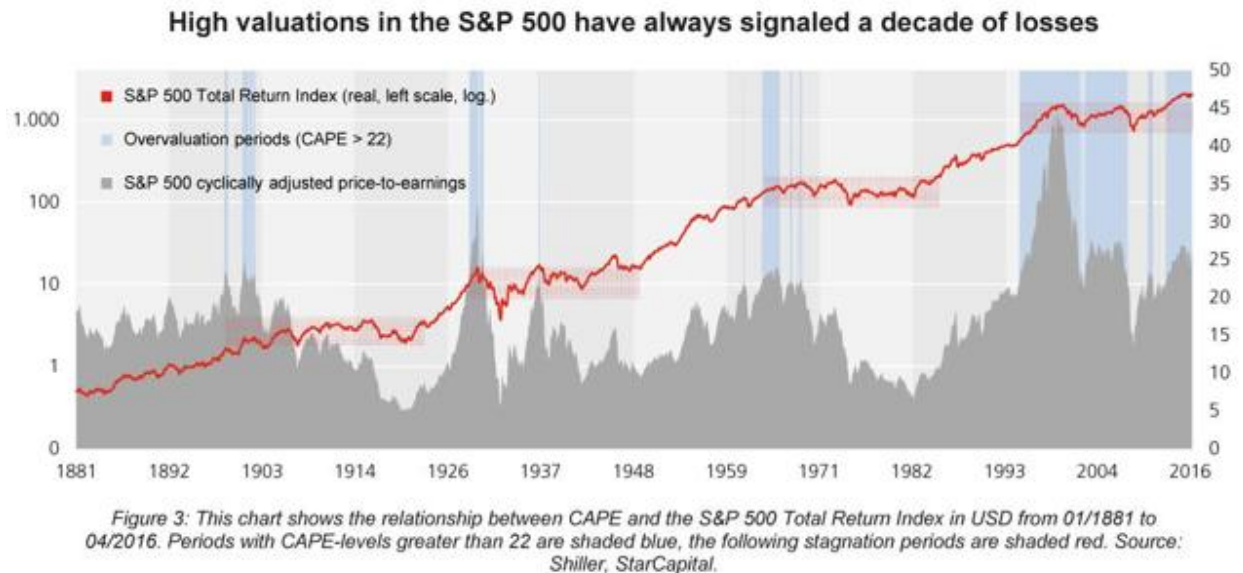
Furthermore, PE always looks unattractive in times of crisis because of the lower corporate earnings, yet this is when the buying opportunities are most lucrative. For these reasons, PE based on current or projected earnings is totally unsuitable as a forecasting tool. Fortunately, there are better forecasting tools than the classic PE.

Cyclically adjusted price-to-earnings ratio (CAPE)

As far back as 1934, Graham and Dodd suspected that cyclical fluctuations in earnings could adversely affect the validity of PE. As a result, they recommended using a long-term average of historical earnings to calculate the PE. In 1998, Robert J. Shiller, winner of the Nobel Prize in Economic Science, and John Campbell acted on this suggestion. The professors were able to prove that inflation-adjusted corporate earnings in the US S&P 500 had grown relatively steadily since 1871, increasing by just under 2% annually. As both above-average corporate earnings in economically strong years and high corporate losses in periods of recession are not sustained over longer periods of time, they developed a cyclically-adjusted price-to-earnings ratio. CAPE puts the current market price in relation to the average inflation-adjusted earnings of the previous 10 years. Adjusted for an economic cycle, it duly measures whether the value of an equity market is high or low compared to its earnings level, to which it will very probably return.

Attractive CAPE indicates investment opportunities

The cyclically adjusted CAPE actually permits much more reliable long-term return forecasts than the classic PE. Over the past 135 years, for example, the CAPE for the US stock market remained in the range of 10 to 22 in all but a handful of cases, often returning to its historical average of about 17 (Figure 3).



The CAPE has significantly exceeded this range just four times: 1901, 1928, 1966 and 1995. For each of these years, plausible reasons were given for why long-standing methods of evaluation should no longer apply, such as the introduction of mass production or the telephone, the departure from the gold standard or globalization. Authors such as Siegel also provide a strong rationale for the current, significantly higher CAPE levels. For example, extremely negative interest rates may be the reason for lower risk premiums, changes to accounting rules may underestimate the earnings potential of the S&P 500 companies and, adjustments to dividend policies, with increased buybacks, could lead to a permanently higher earnings growth. All of these factors provide good reason for higher CAPE levels and only the future will reveal whether they actually herald a new era in evaluation terms, or whether Templeton's dictum once again holds true: *"The four most expensive words are 'this time it's different'"*.

One thing is certain: All the reasons given for higher valuations over the last 135 years, no matter how plausible, have proven wrong: The S&P 500 marked record highs in all of these overvaluation periods. As a general rule, those who invested in these overvaluations

experienced real losses over periods of 10-20 years. In contrast, those who invested during periods of attractive CAPE and pessimistic market sentiment always benefited from above-average returns in the long term.

CAPE enables international return forecasts

This correlation is not exclusive to the US market. In our recent study, "Predicting Stock Market Returns Using the Shiller-CAPE", we found evidence of comparable relationships in all the country indices surveyed for the period 1979-2015. Despite much shorter assessment periods, different accounting standards and regional differences, the same applies to all countries: attractive valuations were followed by high returns while overvaluations led to low returns (Figure 4).

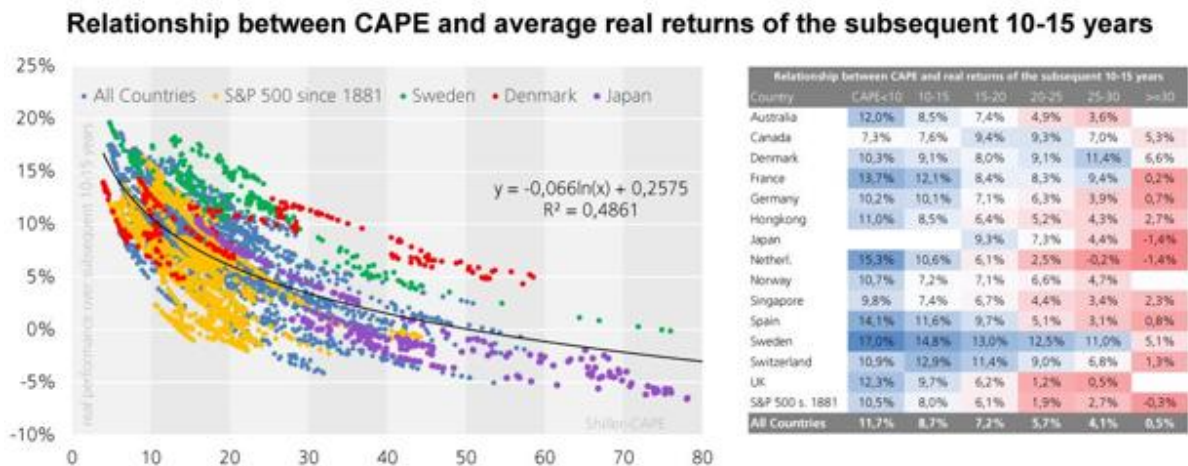


Figure 4: The left chart shows the relationship between CAPE and the returns of the subsequent 10-15 years for the periods 01/1881-05/2015 (S&P 500) and 12/1979-05/2015 (other MSCI countries). The three countries that had the highest absolute effect in terms of "R² Δ", as well as Japan, have been highlighted. All return data is adjusted for inflation, in local currency, incl. dividend income and annualised. The regression function applies to "All Countries". The right table shows the average returns (median) over the subsequent 10-15 years depending on the CAPE in each country. Source: S&P 500: Shiller, other countries: MSCI, calculations: StarCapital.

In Germany, for instance, attractive CAPE valuations of less than 10 were followed by real average (median) earnings growth of 10.2% p.a. over the following 10-15 years. In contrast, investors who chose to commit funds at times when the markets were expensive, with a CAPE of over 30, would have posted gains of just 0.7% in the following years. The Japanese stock market, with its low correlation to other stock markets, stands out both because of its above-average CAPE - at times well above 50 - and its extremely negative subsequent returns. Japan thereby improves the international relationship between CAPE

and subsequent long-term returns. Assuming that this correlation holds for the future, current CAPE values can be used to make rough estimates of possible returns over the next 10-15 years.

Flaws in the CAPE approach

Investors need to note that the CAPE approach is based on the assumption that stock market earnings reverse to their 10-year mean. This cannot be assumed in small markets subject to structural breaks or in markets where earnings growth diverges significantly from the past. This is illustrated by the MSCI Greece, which currently has an extremely low CAPE of below 2: Over the past 10 years, the number of shares in the MSCI Greece has fluctuated between a low of 2 in 2013 and a high of 20 in 2006. In the face of such variations, the question is whether the aggregate corporate profits of these different companies adequately reflect the earnings strength of the 10 companies currently represented in the index. Also, to what extent is a return to the 10-year mean realistic, given that it was greatly determined by the high profits of a now defunct financial industry? A comparison with the broader and more structurally stable MSCI Greece Investable Market Index (IMI), with a CAPE valuation that is several times higher, gives reason for doubt (Figure 5).

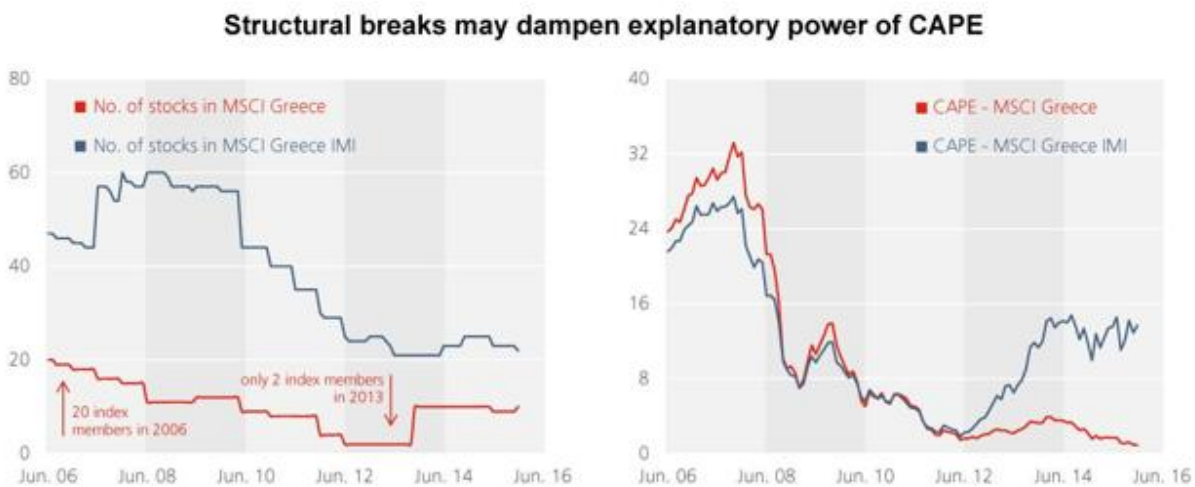


Figure 5: The left chart shows the number of constituents of the MSCI Greece since 06/2006. The right chart shows the CAPE of the MSCI Greece and the MSCI Greece Investable Market Index (IMI). The more stable Investable Market Index (IMI) had more than 20 constituents at all times. Source: MSCI, StarCapital.

Price-to-book ratio (PB) improves return forecasts

In view of the above, it seems advisable to take a look at other key figures used for making long-term return forecasts, not just CAPE. The price-to-book ratio lends itself well to this since book values are less volatile than profits and cash flows, and require no 10-year smoothing. This also eliminates the (not unproblematic) assumption of a comparable market structure over the preceding 10 years. PB is also a good option because it brings an net asset value component to the table beyond CAPE's focus on earnings.

Our results support this research not just in theory. Empirically, PB has been providing return forecasts of comparable accuracy to CAPE forecasts since 1979 (Figure 6). It seems logical that an indicator frequently used as a value proxy at the stock level also correlates to future returns at market level. Probably, the only reason why PB is not used in practice as much as CAPE is because of missing data and the resulting inability to verify it empirically (results for other indicators are shown here).

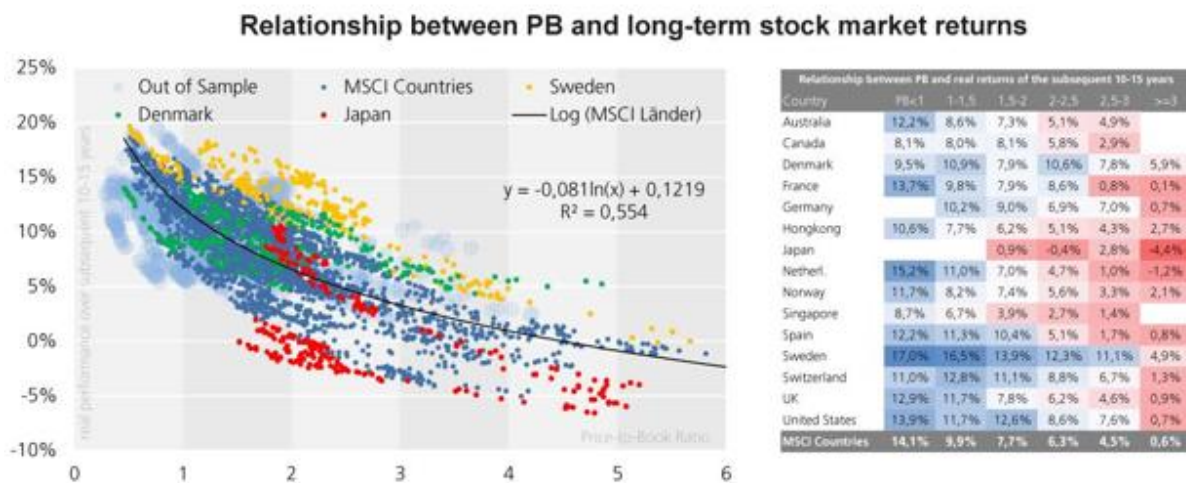


Figure 6: The left chart shows the relationship between PB and the returns of the subsequent 10-15 years for the period 12/1979 - 05/2015. The three countries that had the highest absolute effect in terms of "R² D", as well as Japan, have been highlighted. All return data is adjusted for inflation, in local currency, incl. dividend income and annualised. The regression function applies to all observed "MSCI Countries". The right table shows the average returns (median) over the subsequent 10-15 years depending on the PB in each country. Source: MSCI, StarCapital.

The coefficient of determination (R²), which measures the strength of the relationship between the predicted values and the subsequent long-term returns, is similarly conclusive with both indicators. With an R² of about 0.5 and a correlation of just under -0.7, the relationship between these indicators and the subsequent long-term returns is statistically comparable to the relationship between annual returns of the DAX and the S&P 500 in the period from 1973 to 2015 (R² 0.47 - correlation 0.68).

A further comparison: In the period between 1871 and 2016, earnings growth in the S&P 500 and the returns of the following 15 years showed a much lower correlation (R^2 0.16 - correlation 0.40, Figure 7). This shows that CAPE and PB enable significantly more reliable long-term forecasts than correctly estimated long-term earnings growth rates for the subsequent 15 years.

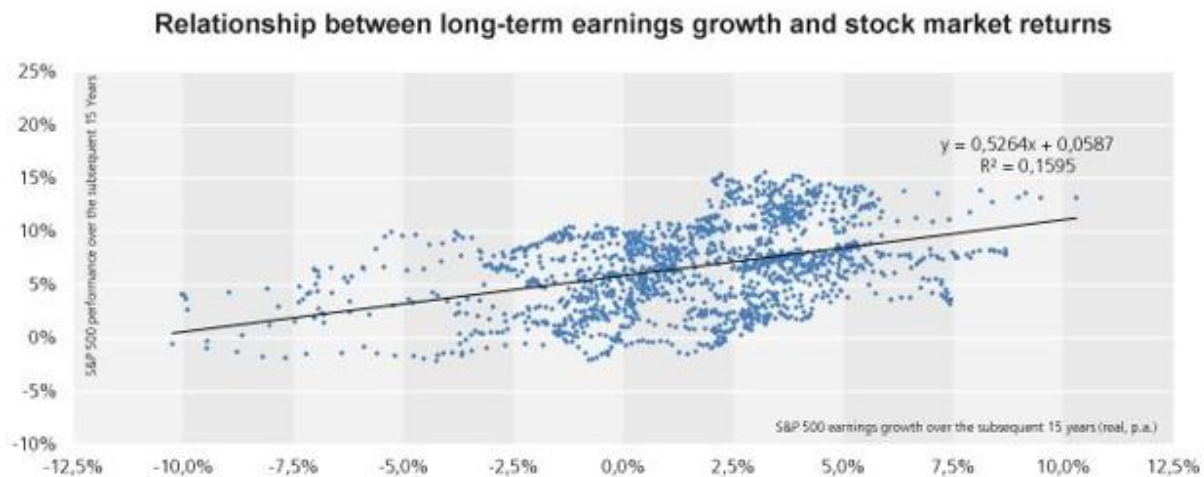


Figure 7: The chart displays the relationship between real earnings growth and real returns of the S&P 500 over the subsequent 15 years for the period 01/1871-04/2016. Source: Shiller, StarCapital.

What level of stock market returns can investors expect?

Assuming that the relationships of the past 135 years continue to hold true, current CAPE and PB values can be used to make long-term forecasts for international stock markets. The US stock market, for example, has a current CAPE value of 24.7 and a PB of 2.8. In the past, valuations at these levels were followed by returns of on average 4.3% p.a. over the subsequent 10-15 years (Figure 8). As such, those investing in the US market in the hope of achieving high long-term returns need to have good reason for doing so, because this kind of growth would be at odds with the stock market experience of the past 130 years.

What returns can investors expect in the long term?

Country	CAPE	PB	Forecast
Australia	15.4	1.8	7.4%
Belgium	20.6	2.2	5.8%
Canada	18.4	1.8	6.9%
Denmark	36.6	3.0	2.7%
France	15.5	1.4	8.3%
Germany	16.0	1.6	7.9%
Hong Kong	14.4	1.2	9.1%
Italy	10.1	1.0	11.2%
Japan	20.7	1.1	8.1%
Netherlands	17.3	1.7	7.3%
Norway	11.3	1.3	9.7%
Singapore	11.4	1.1	10.3%
Spain	9.9	1.3	10.3%
Sweden	18.1	1.9	6.7%
Switzerland	20.5	2.4	5.5%
United Kingdom	13.2	1.8	8.1%
United States	24.7	2.8	4.3%
World AC	19.1	1.8	6.7%
Developed Markets	20.0	1.9	6.4%
Emerging Markets	13.6	1.6	8.4%
Developed Europe	14.7	1.6	8.0%

Figure 8: This table shows the valuations of Datastream Market Indexes as of 30/06/2016, as well as the resultant estimates based on equally weighted CAPE and PB regression functions for real stock market returns in the coming 10-15 years in local currency and incl. dividends.

In some European markets, however, including Germany, higher stock market returns can be expected. The German stock market, for example, currently has a CAPE of 16.0 and a PB of 1.6. In the past, periods with comparable valuations were followed by average long-term annual returns of 7.9%.

At present, the emerging markets offer even higher expected long-term returns. After over five years of underperformance, long-term returns of over 8% p.a. seem probable (details and updates here).

Which uncertainties cloud these forecasts?

Generally, however, the predicted performance is achieved not through a stable upward trend, but with strong fluctuations which can be described in terms of scenario analyses. Looking at the S&P 500 and taking valuations comparable to those of today, Figure 9 shows the course taken by past equity markets over the following 1 to 15 years.

Historically, returns of between 1.9% and 6.4% followed on from valuations similar to those we see today. Transposed onto the S&P 500, this would put it at about 3,200-6,100 points in 2031, assuming reinvestment of dividends and a conservative inflation rate of 1%. The light grey corridor in Figure 9 thus shows the most likely future development of the S&P 500 based on comparable historical values. The sideways tendency of the corridor suggests that investors should not necessarily expect the real returns of about 7% seen in the past to be repeated over the next 15 years.

Analysis suggests increase in S&P 500 to over 3,200 points by 2031

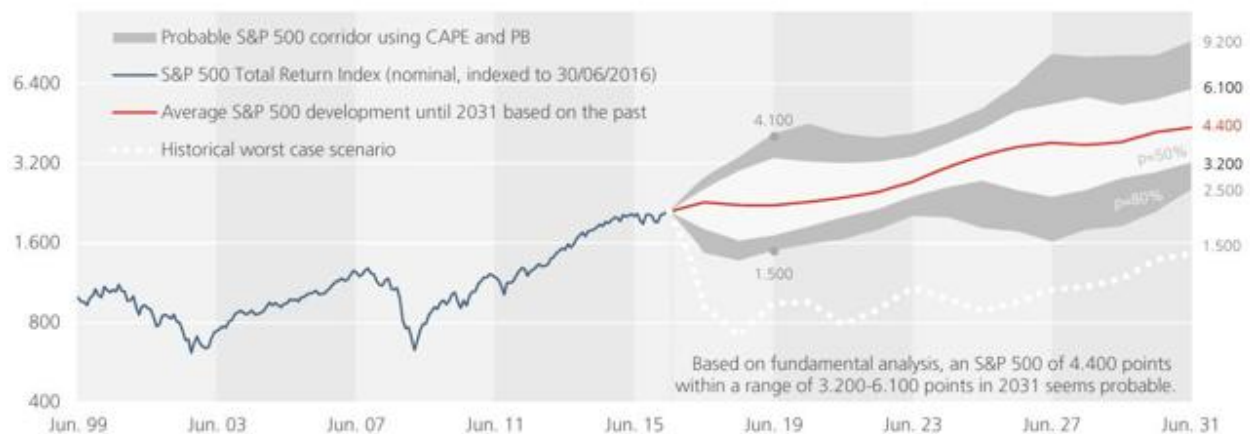


Figure 9: This chart shows the nominal S&P 500. As of 06/2016, the US market has a CAPE of 24,7 and a PB of 2.8. The diagram shows the average subsequent returns (which followed a comparable valuation worldwide) over 1 to 15 years. The light grey corridor (p=50%) reflects 50% of all observed values, the dark grey 80%. The worst case scenario corresponds to the lowest subsequent return measured for a comparable value. The average S&P 500 development (red) shows the average of the average subsequent returns using CAPE and PB. All calculations assumed an inflation rate of 1% and reinvestment of dividends.

The scenario corridor depicted in the chart does not just enable us to draw conclusions about possible long-term returns. It also provides information about medium-term risks and rewards, as well as the limits of fundamental subsequent return estimates. If you exclude outliers - that is, the highest and lowest 10% of the historical extreme periods - it is clear that the S&P 500 could fall to 1,500 points or climb to 4,100 points over the next three years.

The "worst case scenario" in the chart, showing the potential to correct down to 700 points, corresponds to the lowest subsequent return ever measured for a comparable valuation. Although such a scenario - based on negative outliers - is highly unlikely, it does give us an insight into the impact of extreme events, such as world wars or severe

depressions, as in 1929, and the effect they can have on price developments. Needless to say, it is just as unlikely that the S&P 500 will reach 6,700 points within the next three years (as an outlier, this "best case scenario" is not depicted in the chart).

Scenario analysis for the German stock market

The distribution of returns in the German market is far more upbeat. In the past, subsequent returns of between 5.4% and 9.5% were generally measured on values comparable to today's for the following 15 years. This would correspond to a DAX level of approximately 24,000-43,000 points.

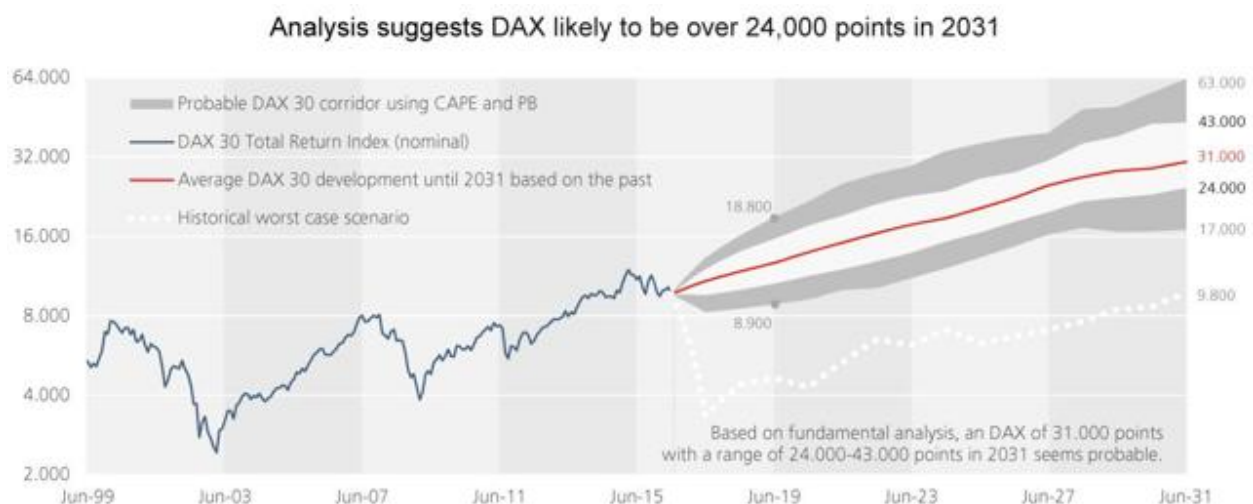


Figure 9: This chart shows the nominal DAX 30 Index. As of 06/2016, the DAX has a CAPE of 16.0 and a PB of 1.6. The diagram shows the average subsequent returns (which followed a comparable valuation worldwide) over 1 to 15 years. The light grey corridor (p=50%) reflects 50% of all observed values, the dark grey 80%. The worst case scenario corresponds to the lowest subsequent return measured for a comparable value. The average DAX development (red) shows the average of the average subsequent returns using CAPE and PB. All calculations assumed an inflation rate of 1% and reinvestment of dividends.

The chart shows that the DAX could fall to 8,900 points within the next three years, or rise to 18,800 points. The worst-case scenario, showing the DAX at 9,800 in 2031, corresponds to an annual return of +0.1%. Looking at a more probable return of 5-9% p.a., it is unlikely that this worst-case risk would be as upbeat for other investment forms, such as government bonds, given the already negative interest rate environment and current national debt.

Conclusion

Equity investment is not just the most lucrative long-term form of investment; taking inflation and liquidity into account, it is also one of the safest. This is especially true of times when valuations are attractive, as is currently the case in Europe and emerging markets in particular. Strategic investors, who decide not to position themselves along with the masses who stick close to the benchmark with high US weightings, can therefore expect long-term gains of about 8% p.a. above inflation. At the moment, no other asset class can offer comparable potential.

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