

The impact of rising rates and inflation on equities

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- Higher rates driven by higher growth expectations should be broadly positive for equity markets (especially at the cyclical end).
- Value has historically benefitted in rising inflationary environments, whereas a prolonged phase of declining inflation tends to make value less attractive versus growth stocks. Value also tends to outperform the market when yields are rising.
- We find that the dispersion in equity duration across sectors is not as wide as commonly perceived (growth stocks are not necessarily long duration).
- When inflation is rising, reported earnings push up nominal ROE, which brings the price-earnings ratio down, creating the illusion that a stock is cheap.
- Inflation has no direct effect on the equity risk premium, but higher levels of inflation are often associated with greater uncertainty.

1 / Summary

Concerns about inflation have taken centre stage for investors this year following unprecedented levels of government stimulus, especially in the light of the recent US inflation prints. In this paper, we do not take a view on whether inflation will hold. Instead we examine the historical trends for equities associated with the rise in interest rates and inflation.

Notions of how inflation affects equities are many and varied. On the one hand, equities provide investors with exposure to 'real assets'. On the other hand, it is hard for companies to keep up with the hidden costs of inflation. Remember the 'investor misery index', i.e. the inflation rate plus the ratio of capital that must be paid to transfer annual earnings delivered by companies into your own pocket when inflation is running high (see 1979 Berkshire Hathaway shareholder letter). The conclusion of Mr Buffett was that high inflation rates rarely translate into higher real rates of return.

Through our own bottom up analysis we arrive at four conclusions:

- ➔ **The underlying cause of the rise in interest rates must be properly understood in order to understand its effect on equities.** If the driver is higher growth expectations, this should be broadly positive for equity markets (especially at the cyclical end), whereas sustained (i.e. multiyear, rather than one-off) rising inflation expectations should have a more mixed effect, depending on company type. Companies with strong cash returns (a measure of competitive advantage) tend to do better than peers in a rising inflation environment. There is also strong empirical evidence that value performs better in an environment where bond yields are rising.
- ➔ **Within the equity asset class, the effects of rising rates and inflation can vary.** Received wisdom has it that growth-orientated sectors tend to be long duration, so should be much more affected by rising rates. In reality, we find that the dispersion in equity duration across sectors is not as wide as commonly perceived. We therefore favour a more bottom-up approach.

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- **In an inflationary environment, headline earnings can be even more misleading than usual.** When inflation is rising, reported earnings push up nominal return on equity, which brings the price-earnings ratio down, creating the illusion that a stock is cheap. In fact, all nominal measures can become potentially dangerous during inflationary periods.
- **Inflation has no direct effect on the equity risk premium, but higher levels of inflation are normally associated with greater uncertainty, and that can push up the risk premium.** This high risk premium illusion emerges because inflation often results in a de-rating of traditional value stocks; traditional accounting measures become more misleading as rising inflation drives a wedge between reported and cash earnings. It takes a prolonged phase of declining inflation to make value less attractive relative to growth stocks. Higher interest rates significantly impact debt serviceability within global equities.

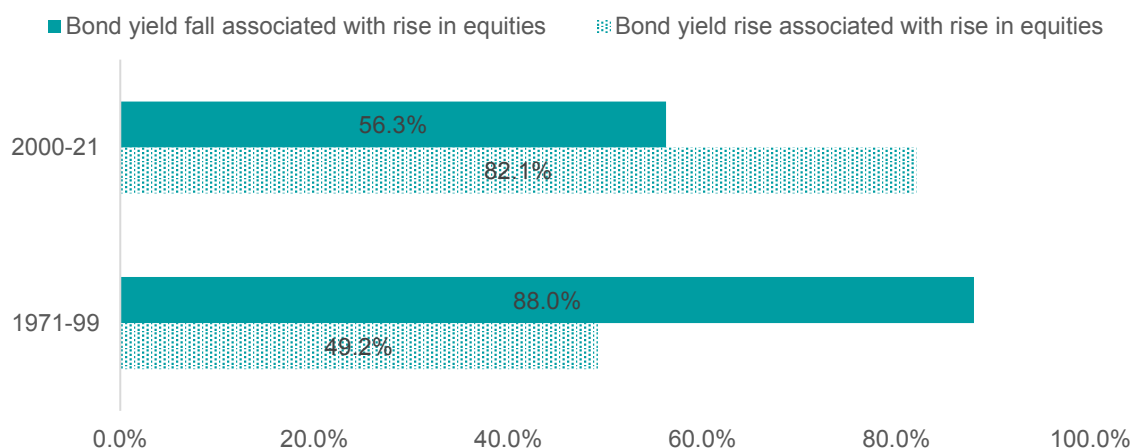
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1 Interest Rates, Inflation & Historical Equity Market Performance

Conventional wisdom suggests that rising bond yields tend to coincide with negative equity returns. We find that this relationship held true in the 1980s and 1990s, but broke down around 2000. For much of the previous two decades, inflation has been much less of a concern than it was in the past. Hence, rising bond yields were mostly a sign of improving expectations for economic growth, supporting equity markets. Until 1999, a rise in bond yields increased the likelihood of a fall in equity markets. However, since 2000, rising bond yields have mostly been associated with rising equity markets, while equities have tended to fall when bond yields fell. Figure 1 shows the proportion of positive quarterly S&P 500 returns in periods of rising (or falling) 10-year US Treasury yields.

FIGURE 1: HISTORICAL RELATIONSHIP BETWEEN BOND YIELD AND EQUITY RETURNS (JUNE 1971 TO MARCH 2021)



Source: DWS, Bloomberg Finance LP. “Bond yield” refers to 10-year US Treasury yields, “equities” refer to quarterly S&P 500 returns. Data as available on 01 April, 2021.

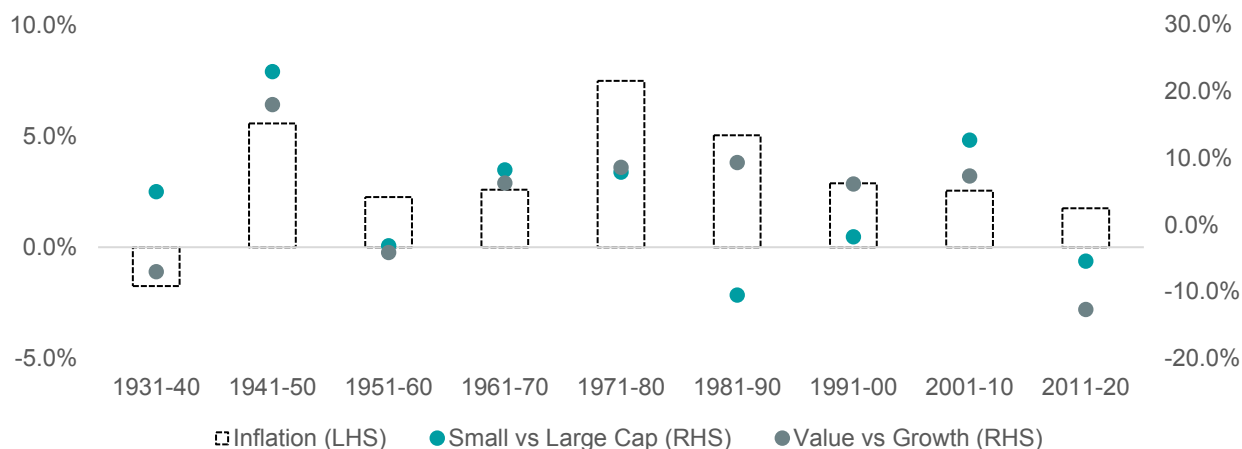
It is important to reiterate that this relationship of past two decades was characterised by largely range-bound interest rates helped by muted inflation. If current market inflation expectations are any indication, we might expect to see a new relationship between the two factors emerging. Regardless, equities do possess some qualities that benefit from an inflationary environment. The growth component of equity returns is both a function of real earnings growth and inflation. Thus, corporate earnings are sensitive to the inflationary landscape for a given country. However, the impact of inflationary pressures is not uniform across the asset class.

To understand this, Figure 2 provides an overview of the performance of the U.S. equity markets, specifically the outperformance of small cap stocks, on the one hand, and the outperformance of value stocks (as measured by low price to book), on the other, through the perspective of inflation.

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FIGURE 2: U.S. CONSUMER PRICE INFLATION OVERLAYED WITH PERFORMANCE OF TWO EQUITY FACTORS

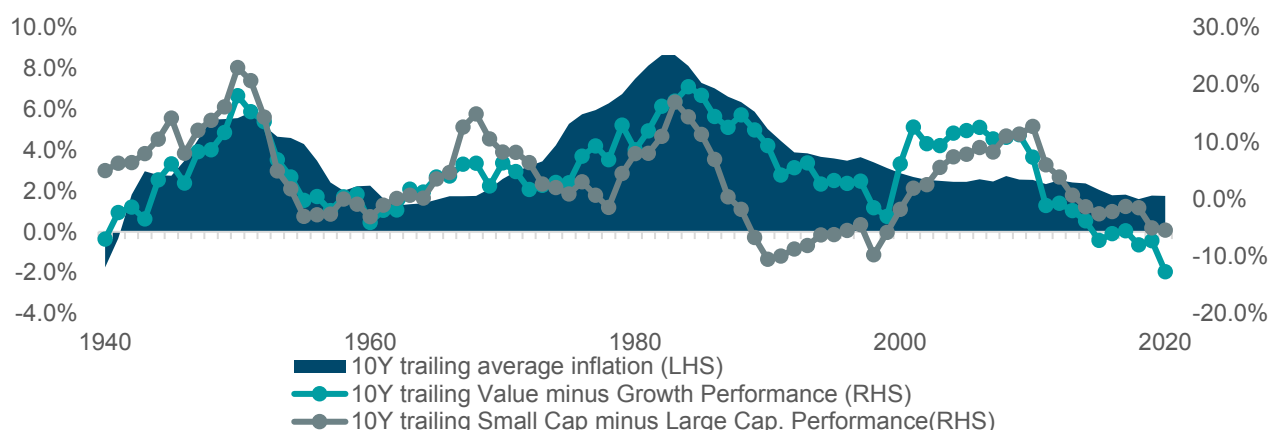


Source: DWS, Federal Reserve Economic Data, Fama French Three Factor Asset Pricing Method. Small is the bottom decile and large is the top decile in market cap, of U.S. stocks. Value is the bottom decile and growth is the top decile in price to book ratios, of U.S. stocks. Period on the x axis refers to the preceding decade. 1940 refers to 1931 to 1940 and so on. Data as available on 31 May, 2021.

When it comes to the small cap premium, there is no detectable pattern that can be related to inflation. Meanwhile, the relationship between inflation and value throws up an interesting conundrum:

- ➔ The three best decades for low price to book stocks were 1941-50, 1971-80 and 1981-90, the three decades when inflation was high (greater than 5% on average).
- ➔ Conversely, inflation trending at 2.5% or lower has not necessarily translated into underperformance of value vs growth.
- ➔ To check on the strength of the relationship, Figure 3 shows the interplay of the 10-year rolling average for the three factors. The correlation between inflation and value/growth is 69%, but is only 15% for inflation and small cap outperformance.

FIGURE 3: U.S. CONSUMER PRICE INFLATION OVERLAYED WITH PERFORMANCE OF TWO EQUITY FACTORS



Source: DWS, Federal Reserve Economic Data, Fama French Three Factor Asset Pricing Method. Small is the bottom decile and large is the top decile in market cap, of U.S. stocks. Value is the bottom decile and growth is the top decile in price to book ratios, of U.S. stocks. Period on the x axis refers to the preceding decade. 1940 refers to 1931 to 1940 and so on. Data as available on 31 May, 2021.

The key conclusion to draw from Figures 2 and 3 is that, while inflationary trends certainly raise the relative attractiveness of value stocks, it takes a prolonged phase of declining inflation to make value less attractive relative to growth stocks. Perhaps this explains the significant correction of value over growth in the past decade as inflation hit rock bottom following three consecutive decades of decline (1990-2020).

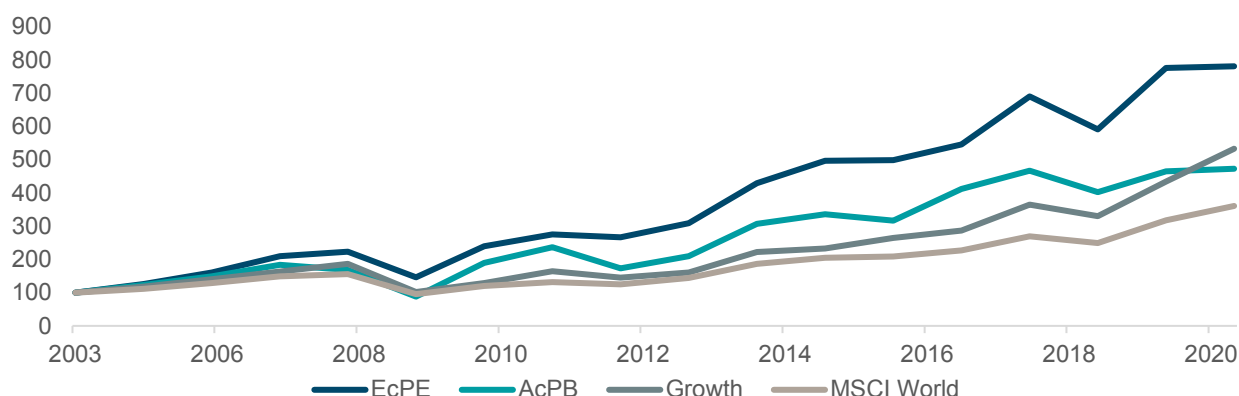
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To look back at the performance of value over the very long term, we have had to use low price-to-book value as a proxy for the broader value factor. However, to the extent that we have the data, we prefer to compare the performance of Economic PE to traditional P/BV. We also use the performance of our sales growth factor as an indicator of the performance of growth stocks. The chart below contains these three timeseries as well as the benchmark.

It is clear that Economic PE was able to remain resilient, even during the phase of prolonged conventional value underperformance over the past decade, and an important reason for this is Economic PE's exposure to quality as well as value (Figure 5). Quality has provided a tailwind in periods where conventional value has substantially underperformed.

FIGURE 4: PERFORMANCE OF ECONOMIC PE VS P/B 2003-2020 (INDEXED TO 100)



Source: DWS CROCI, Bloomberg Finance LP. Series between 31 December 2003 and 31 December 2020. Data as available on 31 December 2020. EcPE, AcPB and Growth in Figure 4 represent the performance of portfolios based on respective factor's 1st decile between 2004 and 2020. Portfolios are equally weighted. All in local currency (net of withholding tax on dividends).

FIGURE 5: PROFITABILITY AND LEVERAGE BY PORTFOLIO TYPE

	Economic PE	Accounting PE
PROFITABILITY & FCF CONVERSION		
EBITDA Margin	23.3%	12.2%
CROCI	13.6%	-0.6%
FCF / Sales	14.4%	3.6%
GROWTH		
Sales Growth	3.9%	-18.0%
LEVERAGE		
Financial Liabilities / Mcap	30.1%	161.8%
VALUATION		
Economic PE	19.0x	n.m.
Price/Book	2.8x	0.7x
Accounting PE	12.6x	46.5x

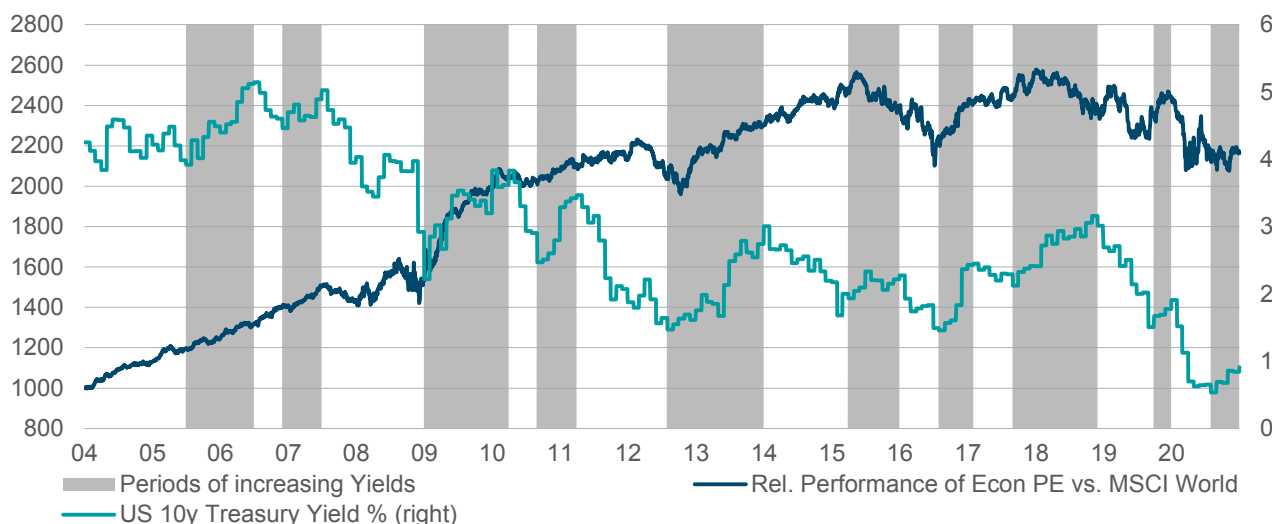
Source: DWS CROCI. Weighted Average for the portfolios (best decile by each factor) as of 31 Dec. 2020. Portfolios are equally weighted. CROCI coverage is excluding Banks.

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We have also looked more specifically at how Economic PE has performed relative to the movements in the 10-year US Treasury yield. The results since 2004 suggest that Economic PE is more likely to outperform the broader market when yields are rising than when they are falling. In the chart below we have shaded the periods where the 10-year US Treasury yields are rising, and with only two exceptions this coincides with outperformance of the Economic PE factor. On the other hand, Economic PE underperformed the market on more than half of the occasions when yields have fallen.

FIGURE 6: ECONOMIC VALUE TENDS TO OUTPERFORM THE MARKET DURING PERIODS OF RISING YIELD



Source: DWS CROCI, Bloomberg Finance LP. Series between 31 December 2003 and 31 December 2020. Data as available on 31 December 2020. Economic PE represents the performance of an equally weighted portfolio based on the factor's cheapest decile between 2004 and 2020. All in local currency (net of withholding tax on dividends).

Drawing all this analysis together, it is clear that value as a style has generally outperformed over the long term. The significant underperformance of value during the past decade appears to be strongly connected to culmination of a multi-year trend of falling inflation and interest rates. Current inflationary expectations and the prospect of controlled rises in bond yields appear to be two tailwinds which help support the case for a sustained comeback in value. This is particularly true of Economic Value, whose exposures have seen it outperform in periods of rising interest rates in the past.

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2 Equity Duration

The notion of duration is a well-established concept, particularly for bonds. In recent years it has been increasingly applied to equities too. We examine how the concept of duration works in this context.

For fixed income, the concept can be thought of in two distinct ways:

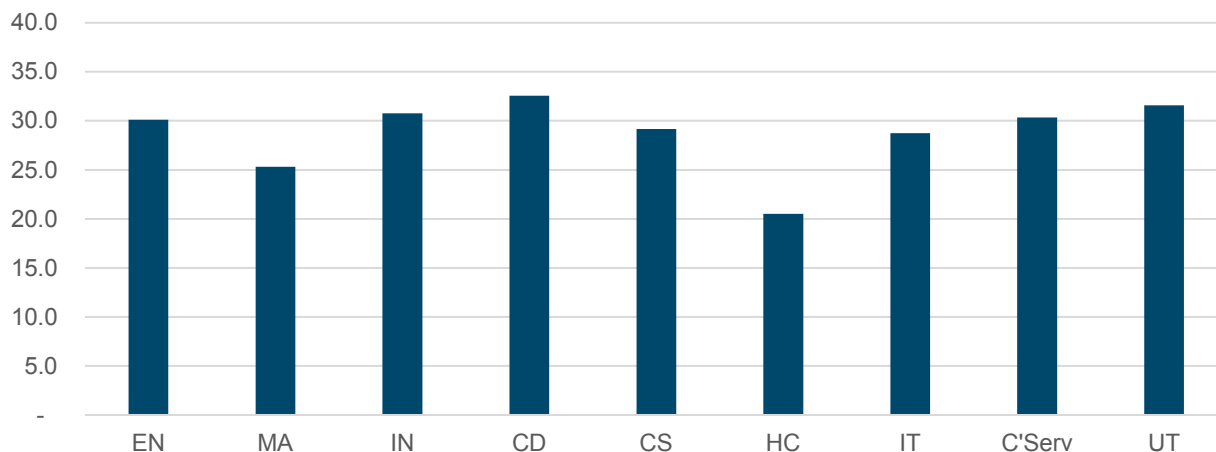
- the weighted average of the time until the fixed recurring cash flows are received (“Macaulay duration”)
- a measure of the price sensitivity of a bond to changes in interest rate levels (“modified duration”)

In fixed income, both measures tend to have the same (or at least very similar) numerical values, even though they are derived in different ways. Since equity investments are a claim on a potentially infinite stream of risk cash flows, estimating equity duration is less straightforward than bond duration. Ultimately, equity duration should still serve as a measure of the sensitivity of equity prices to changes in interest rate. But the impact of interest rate changes on equity valuations is more subtle than its impact on bond valuations, not least because cash flows for equities are not predetermined, unlike for bonds.

Just as for Macaulay duration in the case of bonds, we can estimate equity duration as the weighted average time when the cash flows are received, using a company’s free cash flows¹. As well as cash flow growth, the other principle drivers of duration will be cost of capital and valuation. The cheaper a company’s valuation the shorter its duration will be. But ultimately, the results of our equity duration calculations should give us the impact of changes in cash flow on equity valuation – so it will only indirectly be able to measure the impact of changing interest rates.

Different reasons for changes in interest rate can affect equities in different ways. Both rising inflation and improving economic growth can push interest rates up, but they can have very different effects on equities. For this reason, estimating an equivalent to modified duration for equities requires some judgment about the nature of drivers of rate changes.

FIGURE 7: EQUITY DURATION BY SECTOR



Source: DWS CROCI, Data as available on 23 July, 2021

The dispersion in equity duration across sectors is not as wide as commonly perceived by the markets, and hence a broad-brush approach which assumes growth-orientated sectors such as Information Technology or defensives like Consumer Staples should underperform in a rising rates environment is rather misguided. This may be the result of the cash flows of

¹ Using dividends instead can lead to the counter-intuitive outcome that the valuation of a zero-dividend-paying company is in no way dependent upon interest rates, rather than the far more intuitive result that companies with longer asset lives will tend to have longer duration, all things being equal.

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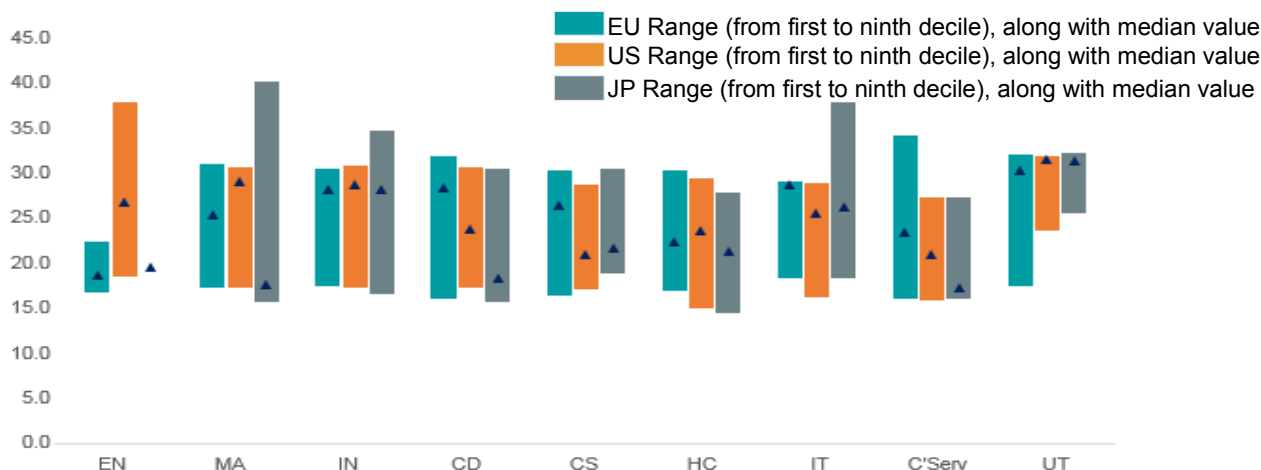
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higher growth companies in a sector potentially overwhelming those of companies earlier in their business cycle and in the process understate their duration.

To examine this premise, we focus on range of equity durations within sectors in the US, Europe and Japan (Figure 8), which leads to some interesting results. For example, the median duration of the Energy sector in the Europe (18.6 years) is almost a third lower than that of the US (26.7 years).

FIGURE 8: EQUITY DURATION BY SECTOR (EU, US & JP REGIONS)



Source: DWS CROCI, Data as available on 23 July, 2021. Includes the non-financial coverage. Only one company is covered by CROCI within Energy sector in Japan and hence the range is not available.

Energy: The regional divergence in the duration within the Energy sector may be the combination of various phenomena, but one point worth highlighting relates to differing approaches to capex. In Europe, spending has been cut drastically, with major companies shifting away from legacy oil and gas to meet zero-emission goals. Their lower capex (at least in the near term) front loads their free cash flow and hence lowers the duration.

Meanwhile, their U.S. peers expect a return to normality to strengthen demand and profit as smaller independents exit the market. Specifically on the point of climate change, the visions may be similar, that oil and gas have a role to play in the transition. However, U.S. majors have asked governments to agree on a framework to curb and mitigate their carbon footprints, in stark contrast to the European majors, which are looking to diversify into new energies at the expense of legacy businesses. Further, carbon-emission related risks appear more appropriately priced in European energy (lower duration or lower relative valuation) than in the US energy sector.

Materials: Japan’s median duration stands out, significantly below that of the U.S. and Europe. This duration discount is driven by the Chemicals sector.

FIGURE 9A: REGIONAL DURATION DISTRIBUTION FOR THE CHEMICALS INDUSTRY

	US	Europe	Japan
Median duration	29.2	28.6	17.5

Source: DWS CROCI, Data as available on 23 July, 2021.

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While it's difficult to attribute one common factor for the lower duration of the Chemicals industry (given exposure to various underlying end markets), Tobin's Q (proxied here by Enterprise Value-to-Net Capital Invested) helps explain the lower duration/valuation of Japan vs the other two regions. When the ratio falls below 1x for a cyclical sector, this generally suggests a prolonged phase of that industry's return on invested capital falling short of the cost of capital.

A phase where Tobin's Q is below 1 often follows an expansionary phase. However, in Japan average Tobin's Q for the chemicals subsector has remained below 1x for over five years. At the same time, the aggregate economic profits (CROCI less the cost of capital) have remained negative between 2016 to 2021E.

FIGURE 9B: MEDIAN EV/NCI FOR THE CHEMICALS INDUSTRY

	2016	2017	2018	2019	2020	2021E
US	2.1x	2.1x	2.2x	2.7x	2.7x	3.1x
Europe	1.8x	2.2x	1.9x	2.3x	2.6x	2.8x
Japan	0.9x	1.0x	1.0x	0.8x	0.8x	0.8x

Source: DWS CROCI, Data as available on 23 July, 2021.

Consumer Discretionary: The CROCI coverage of the Discretionary sector in Japan is largely made up of Autos and Household Durables, with the Automobile industry being the key driver of the lower sector duration. The duration of Japanese Automobiles companies (excluding Components) is significantly below that of European and US companies.

One explanation for this may be that Japanese Automobiles have higher profitability than their US and European peers, but are priced at a discount. The combination of lower duration and substantially lower median financial leverage may prove favourable in rising rates environment.

FIGURE 9C: REGIONAL DISTRIBUTION FOR THE AUTOMOBILES INDUSTRY

	US	Europe	Japan
Median duration	26.6	32.6	16.5
Median CROCI*	1.5%	1.8%	4.2%
Median Implied Economic Earnings/Economic Earnings*	135.9%	186.5%	90.0%
Median Net Financial Liabilities to Market Cap ^A	181.4%	304.1%	35.8%

Source: DWS CROCI, Data as available on 23 July, 2021. *Average of the 5 years' median and average values (2016-20). ^Afor the year 2020.

Communication Services: the sector in Europe has higher duration than that of the U.S. This is driven largely by the Telecom industry, where the overall market valuation of the European Telecom has pushed the duration materially higher than its peers in the U.S (Japan is ignored as only two companies are covered by CROCI).

The capex profile does not shed any light on the situation, and neither does Tobin's Q. One possible explanation is that, despite its lower CROCI, valuation for European telecom is at a premium to that of the U.S. telcos. Moreover, the higher duration makes the European telcos more vulnerable to higher interest rates from a debt serviceability standpoint.

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FIGURE 9D: REGIONAL DISTRIBUTION FOR THE TELECOMMUNICATION INDUSTRY

	US	Europe
Median duration	19.3	26.6
Median CROCI*	3.8%	2.7%
Median Implied Economic Earnings/Economic Earnings*	170.3%	231.8%
Median Net Financial Liabilities to Market Cap^	78.5%	112.5%

Source: DWS CROCI, Data as available on 23 July, 2021. *Average of the 5 years' median and average values (2016-20)

The growth and duration relationship

The market conventionally associates long duration with high growth companies, as the number of years of cumulative free cash flow after expansionary capex to match current valuations will tend to be higher than a low growth company with fewer capital commitments. But in practice, the median growth of the highest duration companies (90th percentile by duration) is significantly below the highest growth companies, across all the three regions.

In higher capital intensity industries higher growth does tend to push up the duration, though. This results from the higher cyclically adjusted capex which potentially offsets much or all of the operating cash flow in the near term. Thus the free cash flow becomes backloaded, assuming that the growth rate converges with the market rate over the medium term.

FIGURE 9E: HIGH GROWTH NOT NECESSARILY EQUAL TO LONG DURATION

	US	Europe	Japan
90 th Percentile by Duration	31.2	32.0	34.9
Median Growth at 90 th Percentile of Duration	2.7%	1.7%	2.1%
90 th Percentile by Growth	6.8%	4.9%	4.4%

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3 The impact of inflation on equities

We have already discussed the indications that inflation rates may be on the rise, thanks to the massive shock of the pandemic and the huge debt-fuelled stimulus packages deployed to mitigate its effects. But even at low annual rates, inflation can accumulate over time and distort the financial metrics that are commonly used to assess companies.

Imagine a hypothetical company that started operations in 1950 and between 1960 and 2020 grew revenue and earnings exactly in line with inflation, everything else remaining constant. Specifically the company:

- has a constant capex-to-sales ratio of 9% with capex having an economic life of 16 years
- manages to maintain an EBITDA margin of 15%
- does not pay any taxes
- is financed wholly by equity that is represented by tangible fixed assets
- distributes all cash that is available (free cash flow) to investors at the end of the year
- Investors put a price of 15.0x on the cash they get, i.e. they assume that the cash they get in a year is what they will get into perpetuity and demand a constant real rate of return of 6.7%.

Figure 10 shows what the common financial metrics would look like for this hypothetical company. Note how inflation can mislead investors: reported earnings appear to grow in line with inflation but free cash flow (FCF), which is what investors actually receive, lags inflation. This happens because depreciation is based on historical cost and lags the actual cash the company spends in replacing those assets. The distortion is of course greater in periods with high inflation. The difference between nominal and real ROE can reach as much as 10% during peak inflation (around 1981), as can be seen in Figure 10).

FIGURE 10: SELECTED P&L, CASH FLOW AND BALANCE SHEET DATA FOR A HYPOTHETICAL US COMPANY

	1960	1965	1970	1975	1981	1991	2001	2010	2020
CPI	1.5%	1.6%	5.9%	9.1%	10.4%	4.2%	2.8%	1.6%	1.1%
Cum. Inflation	100.0	106.6	131.3	181.9	307.4	460.3	598.4	737.1	873.3
Cum. Earnings	100.0	104.2	144.3	227.7	427.7	554.7	647.5	769.8	867.8
Cumulative FCF	100.0	106.6	131.3	181.9	307.4	460.3	598.4	737.1	873.3
Cum. Acc. Book	100.0	107.7	120.6	147.5	219.5	395.3	564.8	716.6	875.5
Cum Real Book	100.0	106.6	131.3	181.9	307.4	460.3	598.4	737.1	873.3
Capex to Sales	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Deprec. to Sales	7.9%	8.1%	7.2%	6.2%	5.2%	6.5%	7.4%	7.6%	8.0%
Profit to Sales	7.1%	6.9%	7.8%	8.8%	9.8%	8.5%	7.6%	7.4%	7.0%
FCF to Sales	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
ROE	10.2%	9.9%	12.2%	15.7%	19.8%	14.3%	11.7%	10.9%	10.1%
Infl Adj ROE	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%	8.3%

Source: DWS. Data as available on 31 May 2021.

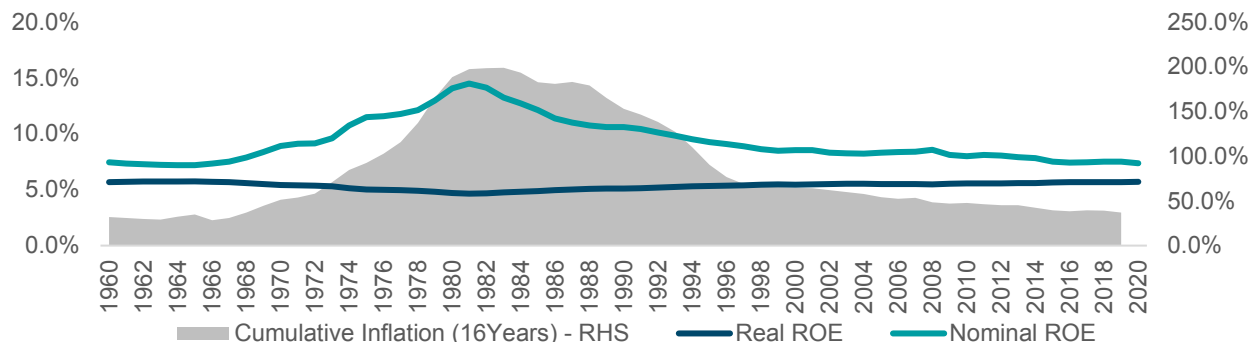
The smile effect of inflation on returns

The example presented in Figure 10 assumes no taxation. If the company were to be taxed at a constant tax rate of 27% on pre-tax profits, the real rate of taxation would increase as inflation goes up. Nominal pre-tax profits go up because depreciation that is charged at historical cost falls as a proportion of sales in a rising inflation environment. The net effect is that earnings fall in real terms and become a poor proxy of profitability. Nominal profitability may appear to improve when in reality it is likely to be falling, producing a smile effect as shown in Figure 11.

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FIGURE 11: DIVERGENCE BETWEEN NOMINAL AND REAL ROE

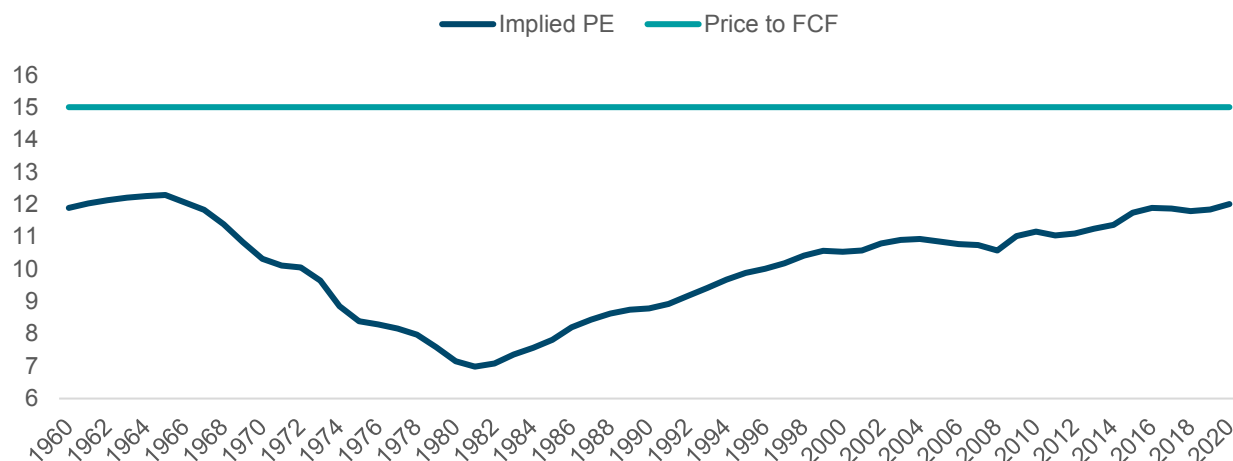


Source: DWS, Data as available on 31 May 2021.

Earnings-based valuations tend to fall during periods of high inflation

As earnings overstate profitability during periods of high inflation, investors need to focus more on cash flows which better reflect real profitability and are what can eventually be paid out to them. For a constant price-to-cash flow of 15x, the earnings multiple needs to fall as low as 7x as is shown in Figure 12.

FIGURE 12: IMPLIED PE VS P/FCF



Source: DWS, Data as available on 31 May 2021.

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FIGURE 13: FOR A CONSTANT P/FCF, PE FALLS DURING TIMES OF RISING INFLATION

	1960	1965	1970	1975	1981	1991	2001	2010	2020
Net Profit	68.7	71.6	99.2	156.5	293.9	381.2	445.0	529.1	596.4
FCF	54.5	58.7	68.2	87.5	136.9	226.8	313.6	393.4	477.3
P/FCF	15x	15x	15x	15x	15x	15x	15x	15x	15x
Theoretical Price	817	880	1,023	1,313	2,053	3,402	4,704	5,900	7,159
Cum. P. Appreciation	100.0	107.7	125.2	160.6	251.2	416.2	575.5	721.9	875.9
Cum. Inflation Rate	100.0	106.6	131.3	181.9	307.4	460.3	598.4	737.1	873.3
CPI	1.5%	1.6%	5.9%	9.1%	10.4%	4.2%	2.8%	1.6%	1.1%
Implied PE	11.9x	12.3x	10.3x	8.4x	7.0x	8.9x	10.6x	11.2x	12.0x
Implied P/B	0.9x	0.9x	0.9x	1.0x	1.0x	0.9x	0.9x	0.9x	0.9x
Implied Infl Adj P/B	0.9x	0.9x	0.8x	0.8x	0.7x	0.8x	0.8x	0.8x	0.9x

Source: DWS. For illustrative purposes only, Data as available on 31 May 2021.

A company that manages to grow its earnings and sales in line with inflation should therefore see a significant reduction in its PE ratio. This reduction creates an illusion of value. Real valuations may not have changed or may even have become more expensive, as the illusion attracts more investors towards equities.

Companies with different profitability and capital intensity are affected differently by inflation

The table below shows how inflation affects companies with different margins and capital intensity (capex-to-sales). We use the same hypothetical company as above (Company A) but have changed the capital intensity for company B (Capex to Sales rising to 12% from 9% in the core case) and changed the EBITDA margins for Company C (rising to 18% from 15% in the core case). Note that Company C's capex-to-sales remains 9%, in line with the core case.

FIGURE 14: EARNINGS MAY GROW AT THE SAME RATE, BUT FREE CASH FLOW DOES NOT

	1960	1965	1970	1975	1981	1991	2001	2010	2020
Company A: base case; Company B: higher capital intensity; Company C: higher margins									
US CPI	1.5%	1.6%	5.9%	9.1%	10.4%	4.2%	2.8%	1.6%	1.1%
Cumulative Inflation Rate	100.0	106.6	131.3	181.9	307.4	460.3	598.4	737.1	873.3
Comp. A FCF	100.0	107.7	125.2	160.6	251.2	416.2	575.5	721.9	875.9
Comp. A Profit	100.0	104.2	144.3	227.7	427.7	554.7	647.5	769.8	867.8
FCF divergence from Profit	0.0%	3.3%	-13.2%	-29.5%	-41.3%	-25.0%	-11.1%	-6.2%	0.9%
Comp. B FCF	100.0	109.9	112.9	117.5	137.7	327.1	529.3	691.1	881.1
Comp. B Profit	100.0	101.6	159.0	279.3	563.7	661.5	702.9	806.7	861.5
FCF divergence from Profit	0.0%	8.2%	-29.0%	-57.9%	-75.6%	-50.6%	-24.7%	-14.3%	2.3%
Comp. C FCF	100.0	107.3	127.3	168.0	270.8	431.5	583.5	727.2	875.0
Comp. C Profit	100.0	104.9	140.4	214.0	391.9	526.6	632.8	760.1	869.4
FCF divergence from Profit	0.0%	2.3%	-9.3%	-21.5%	-30.9%	-18.0%	-7.8%	-4.3%	0.6%

Source: DWS. For illustrative purposes only, Data as available on 31 May 2021. FCF and Profit numbers are indexed to 100 with the 1960 as the base. FCF of any two scenarios/companies are incomparable because of different base values.

The difference in the free cash flow of these three companies is striking. By 1980 Company B's FCF is understated by around 75%, relative to its profit. Company C manages to offset some of the negatives effect of inflation but cash flow still lags earnings despite higher EBITDA margin. This shows that companies with high margin are least impacted by inflation.

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Capital intensive sectors with low free cash flow generation are most at risk from rising inflation

Autos, Energy, Food and Staples Retailing, Transportation and Utilities are likely to suffer the most in a rising inflation environment. Not only are these companies capital intensive, but in many cases, the margins are not high enough to offset this, so free cash flow generation is poor.

Technology, Pharmaceuticals, Food Beverage & Tobacco and Household & Personal Products are best placed for a rising inflation environment.

At the company level, two characteristics are particularly valuable in an inflationary environment:

- (i) an ability to increase prices easily (even when product demand is flat and capacity is not fully utilized) without fear of significant loss of either market share or unit volume, and
- (ii) an ability to accommodate large dollar volume increases in business (often produced more by inflation than by real growth) with only minor additional investment of capital.

Those companies that can achieve both clearly become particularly prized against an inflationary backdrop.

A note on earnings retention

The examples above assume the company distributes all cash that is available (free cash flow) to investors at the end of the year. But in reality companies tend to retain some portion of their free cash flow. Whether earnings retention is good for investors depends on the relative attractiveness of the underlying real ROE of the company. To understand this, let's time look back to the beginning of the above example², 1960.

In the first two decades after the Second World War—up to 1965—the aggregate nominal return on book value for US enterprises was around 12 per cent³. With bonds yielding only 3 or 4 per cent, the right to automatically reinvest a portion of the equity coupon at 12 per cent was of enormous value. (Note that investors could not just invest their own money and get that 12 per cent return.)

This reinvestment privilege pushed equity valuations somewhat above book value⁴. In effect, earnings retention allowed investors to buy at book value part of an enterprise that, in the contemporary economic environment, was worth a great deal more than book value. Cash dividends diminished in interest to investors relative to earnings retention. Indeed, the more money that investors thought likely to be reinvested at the 12 per cent rate, the more valuable they considered their reinvestment privilege, and the more they were willing to pay for it. In the early 1960s, investors paid top prices for companies which had the ability to reinvest very large proportions of their earnings. Such a marking-up process temporarily allowed investors to achieve a return that exceeded the inherent earning power of the enterprises in which they had invested.

However, entering an era of accelerating inflation and higher interest rates (mid 1960s, Figure 11), the marking-up process began to reverse. Rising interest rates rapidly reduced the value of all existing fixed-coupon investments. And as long-term corporate bond rates began moving up (eventually reaching the 10 per cent mark), both the nominal ROE and the reinvestment privilege began to look a lot less attractive.

² Fortune (May 1977) How Inflation Swindles the Equity Investor

³ the decade ending in 1955 - the Dow Jones industrials had an average annual return on year-end equity of 12.8 percent. In the second decade, the figure was 10.1 percent. In the third decade it was 10.9 percent. Data for a larger universe, the FORTUNE 500 (whose history goes back only to the mid-1950's), indicate somewhat similar results: 11.2 percent in the decade ending in 1965, 11.8 percent in the decade through 1975

⁴ Dow Jones industrials increased in price from 133 percent of book value in 1946 to 220 percent in 1966

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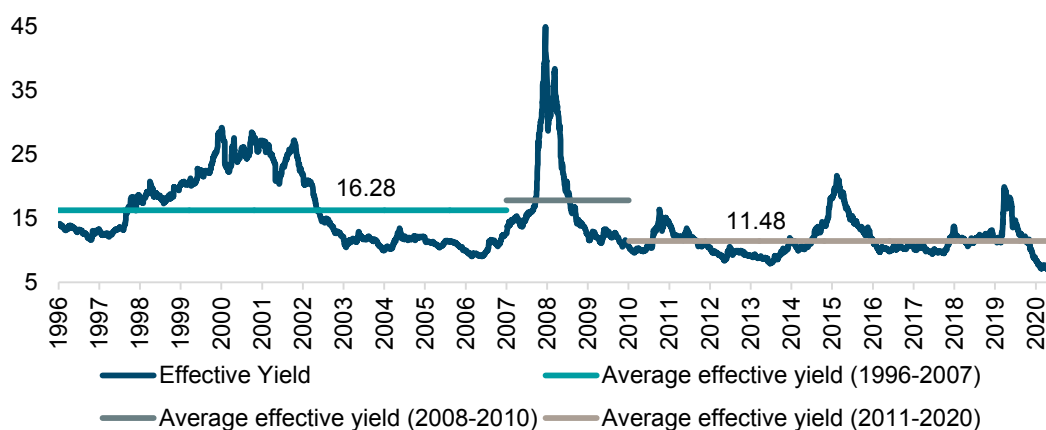
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4 Potential impact of an inflationary environment on levered balance sheets

Central banks have so far managed to keep interest rates in check despite record monetary expansion. Heavy intervention from the authorities has ensured that more companies can fund themselves at ever lower levels of economic growth. The lowest-rated companies are enjoying some of the cheapest borrowing costs in history. All-in yields on corporate debt rated CCC and below have fallen to about 8% from as high as 20.2% as recently as March 2020 (Figure 15). The average yields on these bonds were nearly 500 basis points lower over the past decade than they were in the period before the Global Financial Crisis. Figure 15 shows the average yield 1) over the period 1996-2007 and 2) from 2011 to the current period.

High debt levels in both the public and private sectors seemingly provide an obstacle to any substantial rise in rates. If investors believe that the authorities might step back from their recent aggressive levels of support, a wave of mass selling could follow, potentially prompting systemic defaults. One lesson that appears to have been learnt by policy makers since the Great Financial Crisis is to make every effort not to compound an economic crisis with an associated financial crisis.

FIGURE 15: CCC & LOWER US HIGH YIELD INDEX EFFECTIVE YIELD – PERCENT, DAILY, NOT SEASONALLY ADJUSTED



Source: DWS, Federal Reserve Economic Data, Data as available on 13 May 2021

Figure 16 shows that corporate debt levels are now much higher than ever before, and the Covid-19 shock has exacerbated this further. So future default risk rests on whether servicing this huge debt will remain as easy as it currently is.

FIGURE 16: CREDIT TO NON-FINANCIAL CORPORATIONS AS % OF GDP (ADVANCED ECONOMIES)



Source: DWS, Bank for International Settlements, BIS Statistics Explorer, Data series until September 2020.

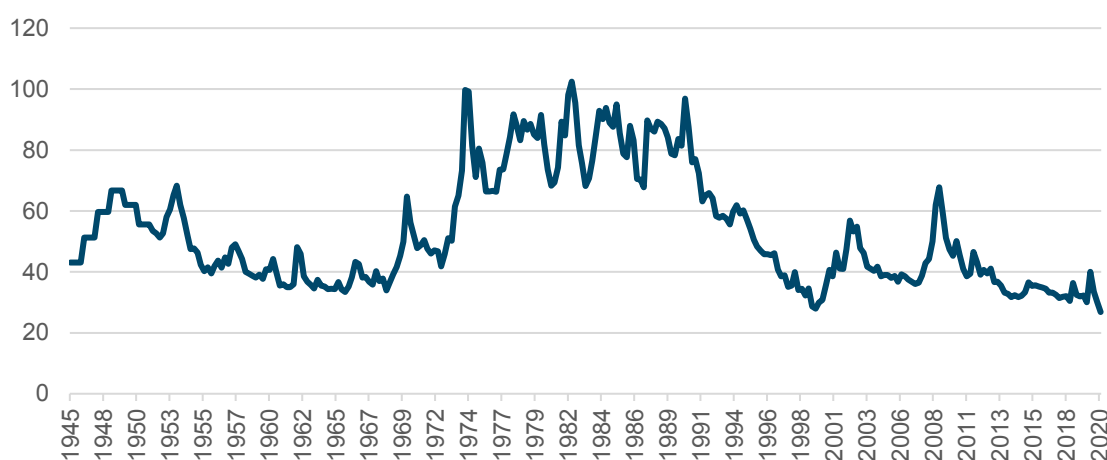
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Debt in relation to market capitalization is now at a level comparable to the TMT bubble (figure 17), but market capitalizations also at record highs are helping to keep the ratio down. The advent of inflation is likely to cause some disruption to global markets, especially in the context of these record debt levels (Figure 16), which are currently priced as though rates will remain low for quite some time (Figure 17).

Inflation has no direct effect on the equity risk premium, but higher levels of inflation are normally associated with greater uncertainty, and that can push up the equity risk premium. Consequently, as inflation increases drive up interest rates, equity risk premiums will tend to increase too. Higher than expected inflation typically transmits quickly into higher corporate borrowing rates, and those higher interest rates can increase the risk of default across all corporate borrowers. While this immediately impacts bondholders, equity shareholders are unlikely to be firewalled, especially when balance sheets are so highly levered.

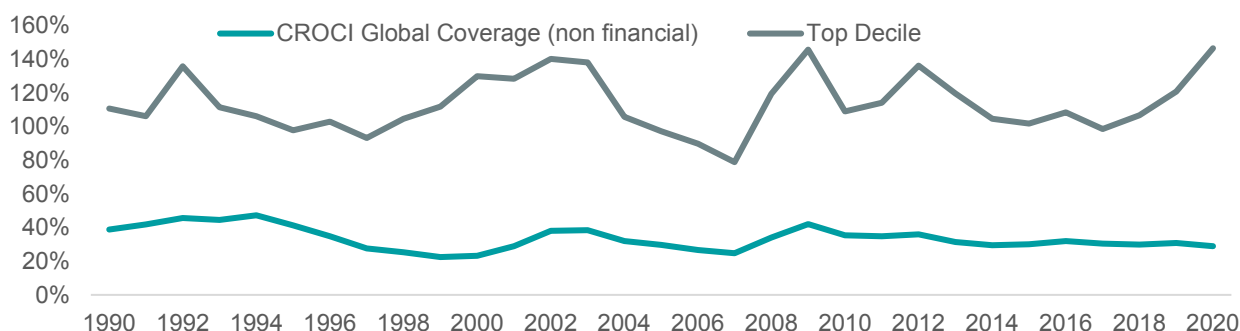
FIGURE 17: NONFINANCIAL CORPORATE BUSINESS; DEBT AS A PERCENTAGE OF THE MARKET VALUE OF CORPORATE EQUITIES (U.S.) - PERCENT, QUARTERLY, NOT SEASONALLY ADJUSTED



Source: DWS, Federal Reserve Economic Data, Data series until October 2020

The low debt to market cap in aggregate is also influenced by the large technology companies, which are virtually debt-free. To counter this bias, we look at the aggregate as well as the top decile of most levered companies amongst the CROCI non-financial coverage universe. Leverage looks rather modest from this perspective, suggesting that an escalation in rates should be manageable. However, for the top decile of indebted companies, debt serviceability appears more challenging in a rising rates scenario. For the moment, markets remain relatively sanguine on this point, however, thanks to the implied backstop currently provided by central banks.

FIGURE 18: NET FINANCIAL LIABILITIES AS % OF MARKET CAPITALISATION



Source: DWS CROCI, Data series until December 2020.

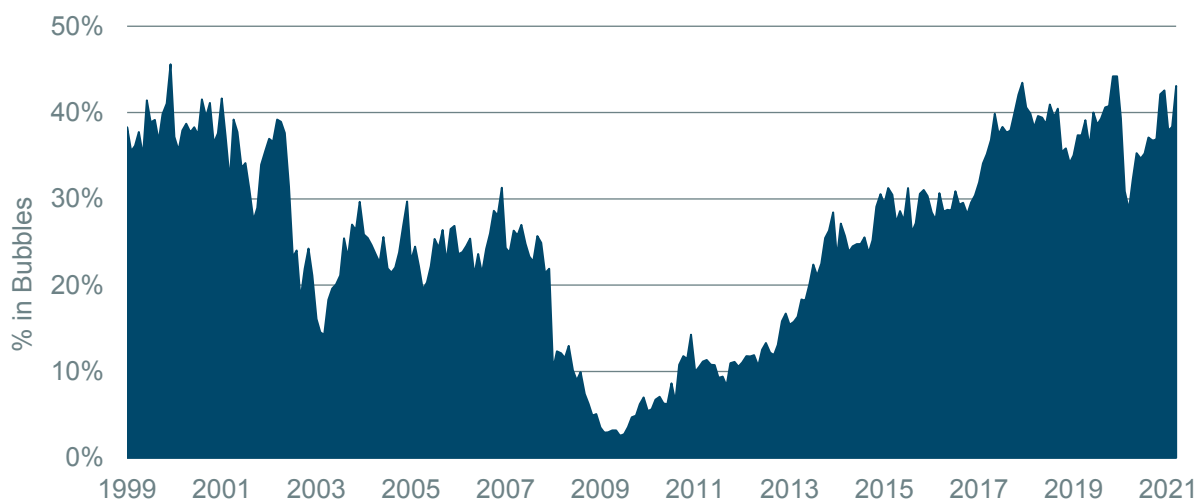
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Another angle to examine is bubbles within global equities, as companies in bubble territory might be particularly exposed should interest rates materially rise thanks to inflation. CROCI defines bubbles as valuations which price at least 50% higher profitability than that which was achieved over the previous five years. Based on this definition, the proportion of global companies in bubble territory is high, at slightly over two-fifths of CROCI's coverage universe, similar to highs reached during the TMT bubble.

Bubbles are ultimately monetary phenomena and can clearly growth out of macro policies. It is this relationship between valuation and economic activity that policymakers have been trying to exploit through monetary easing. Creating asset price bubbles may not be central banks' explicit objective, but controlling where the stimulus goes is notoriously difficult.

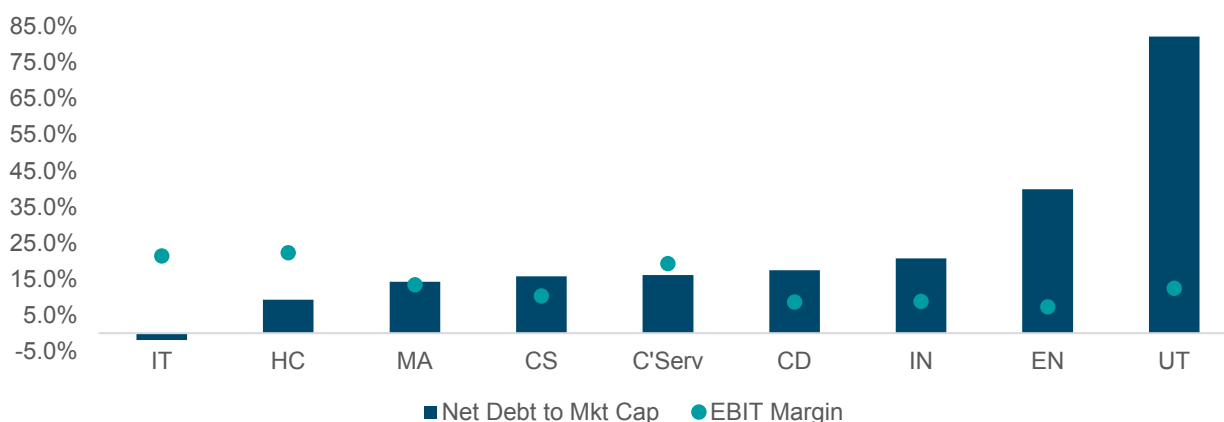
FIGURE 19: GLOBAL BUBBLE ANALYSIS SINCE 1999



Source: DWS CROCI, Data as of 31st March 2021. Numbers represent the proportion of coverage in bubble territory (determined as EV/NCI of 1.5x 5yr average CROCI). Forecasts are not a reliable indicator of future performance. Forecasts are based on assumptions, estimates, views and hypothetical models or analyses, which might prove inaccurate or incorrect.

Generally high financial leverage is harmful in rising bond yield environments, and can be added to low profitability and high capital intensity as undesirable in an inflationary environment. Clearly, on this basis, sectors such as Utilities, Energy, and Communication Services would be prime candidates for prolonged underperformance in the context of rising interest rates.

FIGURE 20: FINANCIAL LEVERAGE AND MARGIN PROFILE BY SECTOR



Source: DWS CROCI, Data as available on 31 May 2021.

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