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History Lessons – why do markets sell-off and then rebound

Main contributors: Francesco Curto, Sarvesh Agrawal

In a nutshell, the answer is fear. The common perception is that collapsing earning expectations during recessions drive share prices. However, they explain only a small part of the price move. In this market sell-off, share prices should have fallen by only 5% if earnings were to fall by a similar magnitude to 2008 and 9% if there was to be a total loss of earnings for the next two years. The rest of the share price fall is from fear, driving up the equity risk premia and the discount rate applied to the earnings. The good news is that fear eventually fades and then the discount rate comes down, driving share prices back up. But this will take time.

Investors wondering how to steer through this crisis should simply ask themselves whether they need to access the capital that they have already invested while the fear level remains high. If the answer is no, then the prudent course would simply be to wait for this turbulent period to end—it always does. This approach may not of course be suitable for investors who do not have such a choice. But, to investors with available liquidity, this market should present attractive long-term opportunities.

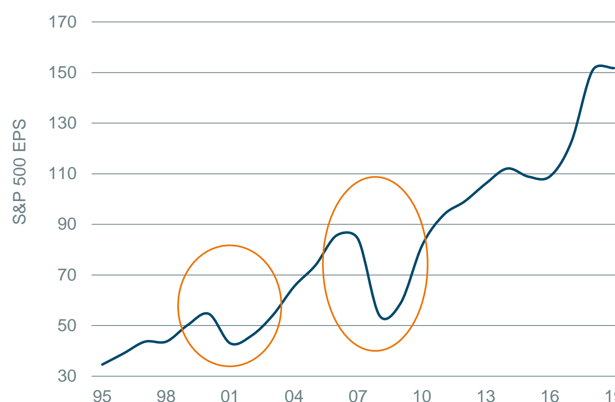
Our intention with this newsletter is to explain the underlying drivers of share prices. We hope that this will be of assistance to investors looking for some guidance on how to navigate through these turbulent times.

Markets at times of crisis

Market sell-offs are normally associated with unexpected events that have a significant economic impact. The cause is different every time. It was Emerging Markets in 1998, TMT in 2000, Financials in 2009, Eurozone sovereign debt crisis in 2012. Now it is COVID-19. The impact is similar, though, an economic and earnings recession.

Markets tend to move early, often before policymakers. Prices fall fast and this is all we hear in the news. This is normal, but pure price dynamics should only really interest speculators, whose focus is on the difference between the price paid and the price received. For investors, the focus should be on how the recession affects future earnings. Let's not forget that equities are a form of capital, generating earnings to compensate investors providing that capital. In a crisis, earnings fall but, unless there were to be a complete destruction of capital, earnings eventually come back.

Figure 1: S&P 500: Nominal EPS



Source: Bloomberg Finance L.P. Data as available on 12 March 2020.

Looking at the S&P 500 since 1995, we note that its EPS fell by less than 50% after both the dotcom bubble and the great financial crisis. There was a similar fall in the earnings of the MSCI World as well. These earnings, however, were back at pre-crisis levels within two years of the dot-com bubble and within four years of the great financial crisis.

The trouble with equities: two variables drive the prices.

This information can be of great help to investors as this can be modelled:

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P = E (y1) + E (y2) + … E(Yn) discounted in today's value

A simple model, like the one above, can be built to analyse the impact on prices from falling earnings. Column 2 in Figure 2 assumes that half of the earnings that were expected before the COVID-19 outbreak disappear for two years, while Column 5 assumes that all of the earnings disappear. Both use the same 5% discount rate that was in evidence before the outbreak (column 1). Significantly, these losses of earnings explain only 5% and 9% of the fall in share prices. Still, at the time of writing, the MSCI World was down 28% year-to-date to 1,310[1], so something else is also taking place.

The trouble with equities is that, during a crisis, both drivers of earnings start to move simultaneously (earnings and the discount rate), which makes the analysis very challenging.

Investors commonly assume that it is earnings that drive share prices. In reality, however, the prices are mainly driven by the changes in investors' risk appetite. This can be assessed from the changes in investors' discount rate. In a crisis, investors demand a higher return for providing risk capital, that is, they are discounting earnings at a higher rate (or, equivalently, applying lower multiples, since multiples are a function of earnings growth and discount rates). This happens even when the yields on government bonds commonly used as reference rates are falling. Think of it in this way: faced with the uncertainty from the COVID-19 outbreak do you now require a higher return for providing risk capital than say three months ago? If your answer is yes, you are a typical investor. Others are doing the same. At the market level, this increases the discount rate and drives share prices lower. This behavior is rational. Faced with higher risk, investors demand higher compensation through higher risk premia. Markets are just adjusting to this new level of risk premia.

Modelling the impact of a 50% fall in earnings combined with changes in the discount rate

The good news is that fear can also be modelled. Before going into it, let's look at the example in Figure 2 in more detail. The table shows three scenarios for earnings. Scenario A is the starting point, pre-COVID-19. Scenario B is a repeat of the 2008 financial crisis assuming an initial 50% loss in earnings persisting for two years, using different discount rates. Scenario C assumes a total loss of earnings for the next two years. This is also shown using different discount rates and is arguably the worst-case scenario.

A 100bp increase in the discount rate in Scenarios B and C produces a far bigger impact on the fair level of prices than a complete wipeout of profits. Fear or the discount rate, therefore, is the main driver of equity prices.

Figure 2: Scenarios showing the impact on prices from the changes in earnings and discount rates

	Scenario A Pre- Covid	Scenario B A repeat of 2008 with a 50% fall in EPS for 2 years			Scenario C Worse than 2008 with no EPS for 2 years		
Column	1	2	3	4	5	6	7
Long term Earnings	100	100	100	100	100	100	100
Earnings Estimates for 2020 & 2021	100	50	50	50	0	0	0
Discount Rate	5%	5%	6%	7%	5%	6%	7%
Fair Price	2000	1907	1575	1338	1814	1483	1248
Market Move		-5%	-21%	-33%	-9%	-26%	-38%

Source: DWS, CROCI. The table shows price changes that different earnings and discount rate scenarios should mathematically produce. Data as available on 16 March 2020.

History lessons in human behaviour or the dark side of valuation

Estimating changes in discount rates generally make investors uncomfortable. This may be because of the behavioral element involved. We all like to think of ourselves as homo economicus, rational thinkers who are not affected by emotion. This is the reason we call the discount factor the dark side of valuation. It is under-analysed and under-researched but has an important role in valuation and prices.

At DWS, within the CROCI Investment and Valuation Group, we have been measuring the discount rate for a long time. We use a model based on long-term dynamics in profits and current prices to estimate it. We can show how the discount rate changed during past crises, and estimate the impact of such moves on prices today. The analysis for the MSCI World[2] suggests:

- Investors in the non-financial part of the market demand a long term real return of 5.4% (the fair value discount rate). During the great financial crisis when investors became very bearish, the discount

[1] Source: Factset. Data as at the close of business on 16 March 2020

[2] The analysis is based on the CROCI coverage of close to 1000 companies representing 85% of equity markets.

rate increased to 5.9%. At the lowest point of risk aversion, investors demanded a rate of return of 4.7%. The discount rate now is 5.2%. So, if they were to become as bearish as in 2008, the discount rate could increase by 65 bps driving non-financial part of the equities market down by just over a third from the spot level (MSCI World: 1,310).

- Investors in banks have demanded a higher return of 7.5% real over the long-term. At the lowest point of risk aversion, the discount rate was 6.5% and at the highest point, the rate was 10.1%. The spot level of the discount rate is 9%. An increase of 110 bps to the level during the financial crisis would result in a 17% fall in the financial part of the market. The good news is that banks are already attractive on long term assumptions and normalisation to a fair value level would mean a 38% total return.

Note that banks have a higher discount rate than the rest of the market because of the higher risk from the leverage they carry.

Figure 3: Sensitivity of global equity values to the changes in the discount rates

	COC	EV/NCI	Market Value move
Non-Financials			
Spot	5.2%	1.16x	
Long-term Average	5.4%	1.05x	-13%
High	5.9%	0.85x	-34%
Low	4.7%	1.59x	48%
Banks			
Spot	9.0%	0.64x	
Long-term Average	7.5%	0.85x	38%
High	10.1%	0.55x	-17%
Low	6.5%	1.11x	85%

Source: DWS and CROCI. Sensitivity is calculated using agglomerated data of companies in CROCI's coverage globally. Data as on 17 March 2020.

Market impact in a repeat of 2008 crisis

It is now possible to estimate the potential impact of a further rise in the discount rate. If the earnings impact by now is in the price, the rest will come through changes in risk aversion. A repeat of the 2008 crisis could push equities down by 30%. The MSCI World index could fall to 900 from the spot 1,310 level. Because of the higher level in cyclicality in earnings, some markets are likely to fare worse than others.

The long term and is this time different?

The good news is that the non-financial part of the market is only 13% expensive on long-term assumptions and financials are 38% undervalued, based on our models. A further 5% decline in prices would push the market to the fair value level (MSCI World at 1,250). Markets rarely stay at the fair value, though. The discount rate could even climb to the peaks seen after the financial crisis. If that were to happen, markets would present an exceptional buying opportunity to the patient investor. We may never get there as our analysis does not consider the yields in other asset classes. Exceptionally low fixed income yields may cap further risk aversion (by, for example, making other risky assets relatively more attractive).

How does a recovery pan out?

Eventually, fear passes. At the peak of fear, the marginal seller has already sold. Everything looks dark. This pandemic may trigger another financial crisis dragging down entire economies. However, as ugly as the situation may be, there is simply too much value at the moment to ignore. This is what attracts contrarian deep value investors who are looking at the bigger picture and are not frightened by ugly situations. Remember Mr. Buffet in 2008? When such investors become net buyers, prices start to rise despite negative news flow. Then when news flow turns positive, risk aversion fades and everything starts to look brighter.

We can observe this behavior in Figure 4, the weekly discount rate for the non-financial part of the market. Much patience and stamina are required in these turbulent times. We urge investors to keep a cool head, and to focus on these important earnings and discount rate distinctions.

Figure 4: Non-Financial Companies' Weekly Cost of Capital

Source: DWS, CROCI. The chart shows weekly series of the Cost of Capital of non-financial companies. Data as of available on 17 March 2020.

Key Risk Factors:

Past Performance: The CROCI Strategies level may rise or fall. The value of investment products linked to the CROCI Strategies may go down as well as up. Past performance, whether live or simulated, is not a reliable indicator of future results.

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Cash Return on Capital Invested (CROCI) is a cash-flow-based analysis which, by making a series of economic adjustments to traditional accounting data, aims to make non-financial companies comparable - regardless of industry or domicile. The main areas where CROCI "economic data" differ from accounting data are as follows:

- Accounting for "hidden" liabilities – CROCI Enterprise Value (EV) includes not only financial liabilities (such as debt) but also operational liabilities (such as operating lease commitments, warranties, pension funding, specific provisions etc).
- Depreciating similar assets in a similar manner - Adjusting depreciation to reflect "economic depreciation" and effective useful economic life.
- Replacement value of assets – Inflating the value of net assets using the relevant inflator (based on the real age of assets).
- Unreported assets – Systematically capitalizing real cash-generative assets that are left off the balance sheet. Research and development costs and advertising are examples of such assets.

Economic PE (Ec.PE): is the CROCI version of the PE ratio and is calculated as EV/(CROCI * NCI) or (EV/NCI)/CROCI

CROCI & Real Value

Real Value Economic value as calculated by the CROCI process via the adjustments to and normalisations of reported financial statements, conducted by CROCI's team of company analysts.

Notes: The CROCI process seeks to make company financial data more consistent, comparable and economically meaningful through a series of reviews and adjustments. This contrasts with more conventional definitions of "Value" that tend to be based on accounting measures such as equity or profits.

The term **Real Value** can be used attributively to refer to companies with the lowest CROCI Economic P/E.

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1. **Fundamental**: any investment is informed or driven by the interplay between the cash flow generation, the capital intensity and the valuation of that company.
2. **Skeptical of reported financial statements as a guide to investing:** Real Investors believe that the income statement and balance sheet in a company's accounts are not necessarily designed to be helpful to equity investors and that a synthesis of all the notes to the accounts and diligent restatement of the accounts must happen in order to render valuations comparable and meaningful; and
Real Investors look to economic value to inform investment and believe that the reported financial statement data may not be representative of the economic reality of a company.
Since CROCI makes adjustments to financial statements in order to include all relevant information in the notes to the accounts, and to restate the accounts in order to render economic valuations, which are meaningful and comparable, CROCI may be one valuable approach.

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CROCI Team
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