

Johannes Müller
Head of Macro Research



Christian Hille
Head of Multi Asset



In a nutshell

- Capital markets have followed a cyclical pattern in the past, but the consistency of the results declines as the cycle matures
- Patterns from past capital-market cycles can also be observed in the current cycle
- Our analysis shows that we are not yet in the late-cycle phase

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Capital-market cycles

Can good times last much longer? Insights from our capital-market-cycle model.

Global equity prices have been rising without a major pullback since March 9, 2009, i.e. for nine and a half years. Such phases are called "bull markets." The current bull market has already set so many records that the natural fear is that the party will inevitably have to end soon. Such fears are not new: In the summer of 2014, for example, a major German newspaper ran the headline: "The stock market could drop 70%."¹ In this article we investigate whether past stock-market cycles can provide insights for the current investment landscape.

The definition of a capital-market cycle

If we are to successfully analyze historical cycles, we must first define our terms. What exactly are we analyzing? Capital-market cycles, correct? But what is a capital-market cycle? Where does it begin, and where does it end? Unlike for economic cycles, there is no public institution that 'officially' determines the beginning and end of a capital-market cycle.

Arriving at a theoretical definition for capital-market cycles is relatively easy: A cycle begins with the low after a broad-based decline in prices of at least 20%, in other words a bear market, and ends at the low that follows the subsequent bear market. So far, so good. But capital-market indicators such as equity indices are very volatile and do not abide by theoretical definitions. That will prove somewhat problematic going forward.

Surveying the evidence since the early 1980s, we inevitably encounter an event in October 1987: the stock-market crash. In less than three weeks, U.S. equity market indices plummeted more than 38%, easily satisfying the definition of a bear market. Did this bear market therefore end the capital-market cycle that began in August 1982? Consideration of the environment outside the equity market raises doubts about this. There was no recession, the National Association of Purchasing Managers (NAPM) Index remained solidly above the 50 mark and in October – the month of the crash – even rose from 53.9 to 56.4. The steepness of the U.S. yield curve, measured by the spread between the yield on 10-year and 2-year Treasuries, was roughly 100 basis points and, therefore, far away from an inversion.² Other risk segments, such as high-yield bonds, pulled back briefly but recovered again quickly.³ The bulk of the data did not, therefore, point to a bear market triggered by the fundamentals.⁴ For the purpose of our analysis, we therefore

¹See Die Welt, June 4, 2014, <http://www.welt.de/128719776>

²Inversion refers in this context to the inversion of the yield curve. A yield curve inversion is characterized by long-term debt instruments having a lower yield than short-term debt instruments with the same credit quality.

³As measured by the ICE BofAML US High Yield 100 Index, high-yield bonds closed out 1987 with a gain of 8.1%

⁴There are numerous studies and books dealing with the 1987 crash. For the most part they conclude that a correction after the preceding strong upward move was amplified by technical factors, such as computer program trading, which tested the stock market's limits above all on Tuesday, October 20, 1987, the day after the crash. The interesting question in this context is of course whether the economy would have slid into a

don't define October 1987 as the end of the capital-market cycle that began in 1982.

That of course leaves unanswered the question as to when the capital-market cycle of the 1980s did in fact end. Next in line is the summer of 1990, when the whole environment reeked substantially more of a bear market: The yield curve inverted at the beginning of 1989, and the economy cooled. In spring 1989, the NAPM Index fell below 50 and remained below this magical level for the entire year 1990. The final blow to the economy and the equity market came in summer 1990 when Iraq invaded Kuwait and oil prices spiked. But there is one small blemish: In terms of the S&P 500, the pullback in prices was "only" 19.9%, thus failing to fully meet the definition of a bear market. But given the environment, we would nevertheless consider this the end of the capital-market cycle that began in 1982. This clearly highlights the limitations of a purely theoretical definition of a capital-market cycle.

We therefore consider the following capital-market cycles since the early 1980s:

	Start	End
1980s	August 1982	October 1990
1990s	October 1990	October 2002
2000s	October 2002	March 2009
Current cycle	March 2009	?

It would of course for many asset classes, be better if we could analyze the last five or – even better – the last ten cycles. The problem here is that usable performance data has only been available for a few decades. High-yield bonds, for example, have only been analyzed systematically since the 1980s, while inflation-indexed bonds have only been available since the late 1990s.

The next question is whether individual asset classes display a consistent pattern within capital-market cycles. To analyze this, we divided each of the three completed capital-market cycles into ten equally-long periods and examined the individual asset classes to discern a cyclical pattern. We then checked the results for consistency against the leading academic literature and books on the topic, but also against stock-market maxims.

The good news is that in many cases a cyclical pattern can indeed be identified. The bad news, however, is that history rarely repeats itself in identical patterns, and there are always exceptions to the rule. The consistency of the observations declines with the length of the cycle. For that reason, a cyclical capital-market model can never replace a sound analysis of the respective current parameters, especially towards the end of the cycle. But let's now take a closer look at the cyclical pattern. We should also mention that our analysis focuses primarily on the U.S. market. Since this is by far the world's most important capital market, the insights gleaned from it should also be applicable to other markets.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

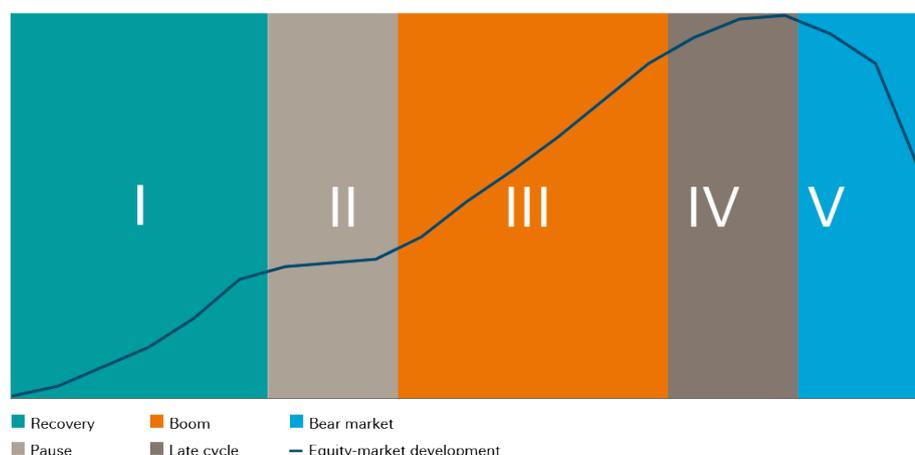
All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

recession had it not been for the intervention by the Federal Reserve. This decisive intervention under the aegis of the Fed Chairman at the time is now referred to as the "Greenspan-Put".

The DWS capital-market-cycle model

Figure 1: The last five capital-market cycles produce a five-phase model.



Sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research, DWS Investment GmbH

We now take a closer look at the five phases, with particular emphasis on Phases IV and V.

Phase I – the recovery. After the painful period of a bear market, risk assets recover. Courageous investors who return to the market at such times, despite the still prevalent panic, are often rewarded. Sovereign bonds turn in a positive performance but clearly underperform corporate bonds, with high-yield bonds outperforming investment-grade bonds. Equities rise like the phoenix from the ashes and bless investors on average with double-digit returns, with conservative strategies outperforming growth strategies. In contrast, classical low-risk investments such as gold do not typically fare well in this phase. The dollar ordinarily appreciates against many other currencies.

Phase II – the mid-cycle breather. A phase with strong price gains is, as a rule, followed by a sideways move. The perception is that the markets are taking a breather to regain their strength. At times when prices stagnate, carry strategies maximizing current income by focusing on high-coupon and dividend-bearing securities make sense. In this phase, high-yield bonds typically perform particularly well.

Phase III – the boom phase. In recent cycles, the boom phase begins roughly after the start of the Fed tightening cycle. After the breather, which normally can also be observed in economic indicators, the economy and therefore the markets typically take off. In this phase, growth stocks now take the lead. Treasuries come under pressure because of the rate hikes, and the yield curve tends to flatten. Corporate bonds, high-yield bonds included, clearly outperform Treasuries. The strength of the dollar slowly peters out.

Phase IV – the late cycle. The yield curve is now flat or even inverse. The transition from the boom phase to a late-cycle phase is characterized by two developments above all: First, volatility begins to increase. The market transitions from a "low-volatility

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

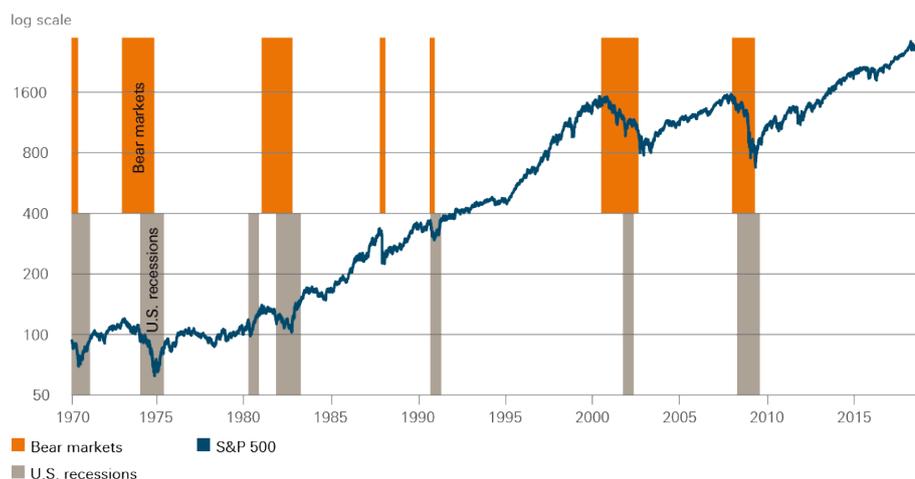
CRC 062843 (11/2018)

regime" to a "mid-volatility regime." The environment for corporate bonds also becomes more demanding. They come under pressure from the frequent erosion of the bond covenants designed to protect creditors, and from increasing merger & acquisition activity. Equities, in contrast, continue to perform well, and it is often the case that an equity-market rally only ends after a "finale furioso." Global equities tend to outperform U.S. equities.

The prevailing view, also in the relevant literature⁵, is that commodities perform better in the late cycle. But here too there were exceptions in past cycles. The situation is exactly the same for the dollar: The widely held view is that the greenback tends to depreciate in the late-cycle phase. While that appears perfectly plausible since the Fed is after all nearing the end of its tightening cycle while other central banks keep tightening, this pattern is not observed in every cycle. Unfortunately, as already mentioned, consistency declines as the late cycle matures. A weaker dollar and rising commodity prices suggest that emerging-market equities and bonds probably perform well in this phase.

Phase V – the bear market. This is the phase in the cycle that leaves a particularly bitter taste in the mouths of many investors for a long time. As already mentioned, a "bear market" is defined as a phase with across-the-board price declines averaging at least 20%. To ensure profitable long-term investments, mitigating the impact of bear markets is therefore the prime directive of capital allocation. Every bear market of the past 50 years occurred in the context of a recession with only one notable exception: the 1987 market crash, as outlined previously, deviated from the norm.

Figure 2: Performance of the S&P 500, bear markets and U.S. recessions



Sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research, DWS Investment GmbH as of 9/12/18

At this point it should be noted that in reality the causality is not merely in one direction: A pullback in security prices triggers a deterioration in the financial parameters, which in turn makes economic actors more cautious and can therefore cause financial market distortions to spill over to the real economy.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

⁵See for example Pring, Martin J.: The All-Season Investor: Successful Strategies for Every Stage in the Business Cycle, John Wiley & Sons, 1992
All articles are available on <https://go.dws.com/cio-view-articles>

An analysis of the behavior of the U.S. markets since 1950 confirms the comments made thus far. As can be seen from Figure 3, historically, equity markets peak on average between twelve and six months before the recession and only pull back strongly in the six months before the start of a recession. This implies that the transition from Phase IV (late cycle) to Phase V (bear market) will probably happen roughly six to twelve months before the start of a recession. Figure 4 shows the development of yields on long-dated bonds: These rise before the recession and peak at the beginning of the recession.

Figure 3 and Figure 4: Average performance before and after the start of a recession



Fig. 3: S&P 500; Fig. 4: U.S. 10-year Treasury yields

Sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research, DWS Investment GmbH as of 8/31/18

Market performance in a bear market can be summarized relatively briefly, at least with respect to risk assets such as equities: There is an across-the-board selloff. Defensive sectors are by their nature impacted less strongly by pullbacks compared to cyclical stocks. High-yield bonds also take a beating and typically turn in a negative performance. In contrast perceived safe-haven investments, such as U.S. Treasuries, profit from the demand for safe havens and from central bank rate cuts. The yield curve steepens. The gold price can also profit from heightened risk aversion. It has also been repeatedly observed that the U.S. dollar appreciates in such a phase. We should, however, point out once again that the consistency of the observations declines later in the cycle. Since there are various triggers of a recession and a bear market, the pattern also varies. To this extent, conclusions about how individual asset classes perform relative to the overall market, especially towards the end of the cycle, should be treated with a great deal of caution.

The current phase of the capital-market cycle

The fact that nine and a half years have now elapsed since March 2009 suggests that we are no longer in the early phases of the cycle. Phase I (recovery) is definitively over. The Fed has been in a tightening cycle since December 2015, albeit in slow motion. The sideways move between 2015 and mid-2016, which we define as Phase II (mid-cycle breather) in the current cycle, is entirely consistent with experiences from earlier cycles.

All articles are available on <https://go.dws.com/cio-view-articles>

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Consequently, Phase III, (boom phase), began at mid-2016. Since we are apparently not yet in Phase V (bear market), the only question remaining is whether we are still in Phase III (boom) or already in Phase IV (late cycle).

One indicator for timing the transition to Phase IV (late cycle) is the steepness of the yield curve. Here, however, the spread between 10-year U.S. Treasuries and the federal funds rate has proved more suitable than the more commonly used 10Y-2Y spread. In recent decades, the late-cycle phase began when the federal funds rate surpassed the 10-year Treasury yield and the yield curve was therefore inverse. At the moment the curve is still 100 basis points steep, which does not argue for Phase IV (late cycle). Another indicator is the real Federal Funds Rate. In earlier cycles, this rose to 4% before the late-cycle phase dawned. At the moment, the real federal funds rate is still negative, i.e. far removed from the 4% mark.

One macroeconomic indicator that can be used to determine the transition to the late cycle is the difference between the current unemployment rate and the NAIRU . In past cycles, measured unemployment on entry into the late cycle was roughly half a percentage point below the NAIRU. Given the current situation on the U.S. labor market, this criterion can already be considered met.

In summary, we conclude that at this point in time we are probably still in Phase III (boom), but already relatively far advanced within this phase. From this perspective, there should therefore still be enough time before Phase V (bear market) looms on the horizon.

It should, however, be borne in mind that the current business cycle is characterized by a couple of special features. The first is the reduction of consumer and – in part – corporate debt. Furthermore, since 2008 the central banks have in many cases been using unconventional instruments with no historical data on their impact or possibly undesired side-effects. Independent of this, it has also occurred that a cycle came to an abrupt end in the past, such as on the outbreak of a war or a sharp rise in the price of oil. In this regard, the trade conflict would be one recent example that spontaneously comes to mind.

Conclusion

We see capital-market-cycle analysis as a tool that can supplement other market-analysis instruments. This tool suggests that the capital-market cycle is not yet over but has in fact still some years to run. The fact that the end of the bull market is already a topic of such frequent discussion also argues against it ending any time soon. There's life in the old dog yet. But this should not be taken as gospel.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Glossary

Basis point

One **basis point** equals 1/100 of a percentage point.

Basis point

One **basis point** equals 1/100 of a percentage point.

Bear market

Technically, a **bear market** refers to a situation where the index's value falls at least 20% from a recent high.

Bull market

A **bull market** is a financial market where prices are rising - usually used in the context of equities markets.

Carry (strategy)

Carry is a strategy in which an investor sells a certain currency with a relatively low interest rate and then buys another, higher-yielding currency.

Coupon

Coupons are interest rate payments made on a bond.

Covenants

Covenants designate contractual obligations or restrictions intended to protect the financial interests of creditors.

Emerging markets (EM)

Emerging markets (EM) are economies not yet fully developed in terms of, amongst others, market efficiency and liquidity.

Federal funds rate

The **federal funds rate** is the interest rate, set by the Fed, at which banks lend money to each other, usually on an overnight basis.

Greenback

Greenback is a commonly used expression for the U.S. dollar.

High Yield (HY)

High-yield bonds are issued by below-investment-grade-rated issuers and usually offer a relatively high yield.

Inflation-indexed Bond

An inflation-indexed bond is a bond where the principal and / or coupon is indexed to the consumer price index.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Investment grade (IG)

Investment grade (IG) refers to a credit rating from a rating agency that indicates that a bond has a relatively low risk of default.

ISM Purchasing Managers Index

The ISM Purchasing Manager Index, published by the Institute for Supply Management, measures economic activity by assessing the sentiment among purchasing managers. It is an important indicator of the economic health.

Mergers and acquisitions (M&A)

Mergers and acquisitions (M&A) are the two key methods of corporate consolidation. A merger is a combination of two companies to form a new company, while an acquisition is the purchase of one company by another in which no new company is formed.

Non-Accelerating Inflation Rate of Unemployment (NAIRU)

The **Non-Accelerating Inflation Rate of Unemployment (NAIRU)** describes rate of unemployment refers to a level of unemployment below which inflation accelerates.

Recession

A **recession** is, technically, when an economy contracts for two successive quarters but is often used in a looser way to indicate declining output.

Recession

A **recession** is, technically, when an economy contracts for two successive quarters but is often used in a looser way to indicate declining output.

Risk aversion

Risk aversion is a characteristic of investors to prefer the asset with lower risk and thus accept a lower potential yield.

S&P 500

The **S&P 500** is an index that includes 500 leading U.S. companies capturing approximately 80% coverage of available U.S. market capitalization.

Spread

The **spread** is the difference between the quoted rates of return on two different investments, usually of different credit quality.

Treasuries

Treasuries are fixed-interest U.S. government debt securities with different maturities: Treasury bills (1 year maximum), Treasury notes (2 to 10 years), Treasury bonds (20 to 30 years) and Treasury Inflation Protected Securities (TIPS) (5, 10 and 30 years).

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

U.S. Federal Reserve Board (the Fed)

The **U.S. Federal Reserve Board**, often referred to as "**the Fed**", is the central bank of the United States.

Volatility

Volatility is the degree of variation of a trading-price series over time. It can be used as a measure of an asset's risk.

Yield curve

A **yield curve** shows the annualized yields of fixed-income securities across different contract periods as a curve. When it is inverted, bonds with longer maturities have lower yields than those with shorter maturities.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Risk warning

Investments are subject to investment risk, including market fluctuations, regulatory change, possible delays in repayment and loss of income and principal invested. The value of investments can fall as well as rise and you might not get back the amount originally invested at any point in time.

Investments in Foreign Countries – Such investments may be in countries that prove to be politically or economically unstable. Furthermore, in the case of investments in foreign securities or other assets, any fluctuations in currency exchange rates will affect the value of the investments and any restrictions imposed to prevent capital flight may make it difficult or impossible to exchange or repatriate foreign currency.

Foreign Exchange/Currency – Such transactions involve multiple risks, including currency risk and settlement risk. Economic or financial instability, lack of timely or reliable financial information or unfavorable political or legal developments may substantially and permanently alter the conditions, terms, marketability or price of a foreign currency. Profits and losses in transactions in foreign exchange will also be affected by fluctuations in currency where there is a need to convert the product's denomination(s) to another currency. Time zone differences may cause several hours to elapse between a payment being made in one currency and an offsetting payment in another currency. Relevant movements in currencies during the settlement period may seriously erode potential profits or significantly increase any losses.

High Yield Fixed Income Securities – Investing in high yield bonds, which tend to be more volatile than investment grade fixed income securities, is speculative. These bonds are affected by interest rate changes and the creditworthiness of the issuers, and investing in high yield bonds poses additional credit risk, as well as greater risk of default.

Hedge Funds – An investment in hedge funds is speculative and involves a high degree of risk, and is suitable only for “Qualified Purchasers” as defined by the US Investment Company Act of 1940 and “Accredited Investors” as defined in Regulation D of the 1933 Securities Act. No assurance can be given that a hedge fund's investment objective will be achieved, or that investors will receive a return of all or part of their investment.

Commodities – The risk of loss in trading commodities can be substantial. The price of commodities (e.g., raw industrial materials such as gold, copper and aluminium) may be subject to substantial fluctuations over short periods of time and may be affected by unpredicted international monetary and political policies. Additionally, valuations of commodities may be susceptible to such adverse global economic, political or regulatory developments. Prospective investors must independently assess the appropriateness of an investment in commodities in light of their own financial condition and objectives. Not all affiliates

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

or subsidiaries of Deutsche Bank Group offer commodities or commodities-related products and services.

Investment in private equity funds is speculative and involves significant risks including illiquidity, heightened potential for loss and lack of transparency. The environment for private equity investments is increasingly volatile and competitive, and an investor should only invest in the fund if the investor can withstand a total loss. In light of the fact that there are restrictions on withdrawals, transfers and redemptions, and the Funds are not registered under the securities laws of any jurisdictions, an investment in the funds will be illiquid. Investors should be prepared to bear the financial risks of their investments for an indefinite period of time.

Investment in real estate may be or become nonperforming after acquisition for a wide variety of reasons. Nonperforming real estate investment may require substantial workout negotiations and/ or restructuring.

Environmental liabilities may pose a risk such that the owner or operator of real property may become liable for the costs of removal or remediation of certain hazardous substances released on, about, under, or in its property. Additionally, to the extent real estate investments are made in foreign countries, such countries may prove to be politically or economically unstable. Finally, exposure to fluctuations in currency exchange rates may affect the value of a real estate investment.

Structured solutions are not suitable for all investors due to potential illiquidity, optionality, time to redemption, and the payoff profile of the strategy. We or our affiliates or persons associated with us or such affiliates may: maintain a long or short position in securities referred to herein, or in related futures or options, purchase or sell, make a market in, or engage in any other transaction involving such securities, and earn brokerage or other compensation. Calculations of returns on the instruments may be linked to a referenced index or interest rate. In such cases, the investments may not be suitable for persons unfamiliar with such index or interest rates, or unwilling or unable to bear the risks associated with the transaction. Products denominated in a currency, other than the investor's home currency, will be subject to changes in exchange rates, which may have an adverse effect on the value, price or income return of the products. These products may not be readily realizable investments and are not traded on any regulated market.

Hong Kong

The contents of this document have not been reviewed by any regulatory authority in Hong Kong. You are advised to exercise caution in relation to the investments contained herein. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. This document has not been approved by the Securities and Futures Commission in Hong Kong nor has a copy of this document been registered by the Registrar of Companies in Hong Kong and, accordingly, (a) the investments (except for investments which are a "structured product" as defined in the Securities and Futures Ordinance

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

(Cap. 571 of the Laws of Hong Kong) (the "SFO") may not be offered or sold in Hong Kong by means of this document or any other document other than to "professional investors" within the meaning of the SFO and any rules made thereunder, or in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong) ("CO") or which do not constitute an offer to the public within the meaning of the CO and (b) no person shall issue or possess for the purposes of issue, whether in Hong Kong or elsewhere, any advertisement, invitation or document relating to the investments which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to the investments which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" within the meaning of the SFO and any rules made thereunder.

Singapore

Singapore Interests in the funds mentioned herein are not allowed to be made to the public or any members of the public in Singapore other than (i) to an institutional investor under Section 274 or 304 of the Securities and Futures Act (Cap 289) ("SFA"), as the case may be, (ii) to a relevant person (which includes an Accredited Investor) pursuant to Section 275 or 305 and in accordance with other conditions specified in Section 275 or 305 respectively of the SFA, as the case may be, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Important Information

DWS is the brand name of DWS Group GmbH & Co. KGaA. The respective legal entities offering products or services under the DWS brand are specified in the respective contracts, sales materials and other product information documents. DWS Group GmbH & Co. KGaA, its affiliated companies and its officers and employees (collectively "DWS Group") are communicating this document in good faith and on the following basis.

This document has been prepared without consideration of the investment needs, objectives or financial circumstances of any investor. Before making an investment decision, investors need to consider, with or without the assistance of an investment adviser, whether the investments and strategies described or provided by DWS Group, are appropriate, in light of their particular investment needs, objectives and financial circumstances. Furthermore, this document is for information/discussion purposes only and does not constitute an offer, recommendation or solicitation to conclude a transaction and should not be treated as giving investment advice.

DWS Group does not give tax or legal advice. Investors should seek advice from their own tax experts and lawyers, in considering investments and strategies suggested by DWS Group. Investments with DWS Group are not guaranteed, unless specified.

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

Investments are subject to various risks, including market fluctuations, regulatory change, possible delays in repayment and loss of income and principal invested. The value of investments can fall as well as rise and you might not get back the amount originally invested at any point in time. Furthermore, substantial fluctuations of the value of the investment are possible even over short periods of time. The terms of any investment will be exclusively subject to the detailed provisions, including risk considerations, contained in the offering documents. When making an investment decision, you should rely on the final documentation relating to the transaction and not the summary contained herein. Past performance is no guarantee of current or future performance. Nothing contained herein shall constitute any representation or warranty as to future performance.

Although the information herein has been obtained from sources believed to be reliable, DWS Group does not guarantee its accuracy, completeness or fairness. No liability for any error or omission is accepted by DWS Group. Opinions and estimates may be changed without notice and involve a number of assumptions which may not prove valid. All third party data (such as MSCI, S&P, Dow Jones, FTSE, Bank of America Merrill Lynch, Factset & Bloomberg) are copyrighted by and proprietary to the provider. DWS Group or persons associated with it ("Associated Persons") may (i) maintain a long or short position in securities referred to herein, or in related futures or options, and (ii) purchase or sell, make a market in, or engage in any other transaction involving such securities, and earn brokerage or other compensation.

The document was not produced, reviewed or edited by any research department within Deutsche Bank and is not investment research. Therefore, laws and regulations relating to investment research do not apply to it. Any opinions expressed herein may differ from the opinions expressed by other Deutsche Bank departments including research departments. This document may contain forward looking statements. Forward looking statements include, but are not limited to assumptions, estimates, projections, opinions, models and hypothetical performance analysis. The forward looking statements expressed constitute the author's judgment as of the date of this material. Forward looking statements involve significant elements of subjective judgments and analyses and changes thereto and/or consideration of different or additional factors could have a material impact on the results indicated. Therefore, actual results may vary, perhaps materially, from the results contained herein. No representation or warranty is made by Deutsche Bank as to the reasonableness or completeness of such forward looking statements or to any other financial information contained herein.

This document may not be reproduced or circulated without DWS Group's written authority. The manner of circulation and distribution of this document may be restricted by law or regulation in certain countries, including the United States.

This document is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction, including the

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)

United States, where such distribution, publication, availability or use would be contrary to law or regulation or which would subject DWS Group to any registration or licensing requirement within such jurisdiction not currently met within such jurisdiction. Persons into whose possession this document may come are required to inform themselves of, and to observe, such restrictions.

Unless notified to the contrary in a particular case, investment instruments are not insured by the Federal Deposit Insurance Corporation ("FDIC") or any other governmental entity, and are not guaranteed by or obligations of DWS Group.

© 2018 Deutsche Asset Management (Asia) Limited

Publisher: DWS Investment GmbH, Mainzer Landstraße 11-17, 60329 Frankfurt am Main, Germany

Additional sources: Bloomberg Finance L.P., Federal Reserve Bank of St. Louis FRED, National Bureau of Economic Research

All opinions and claims are based upon data on 11/16/18 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. Past performance is not indicative of future returns. Forecasts are based on assumptions, estimates, opinions and hypothetical models that may prove to be incorrect. DWS Investment GmbH

CRC 062843 (11/2018)