April 2016

Megatrends

Looking beyond towards the bigger picture

Finanzgruppe

BayernLB

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Megatrends – a new field of action for BayernLB Research

▶ Our megatrend publications are a new additional tool, enabling analysis of the impact of medium-term and longer-term developments

Looking into the future and identifying megatrends are activities which are currently very much in fashion. Megatrends are developments whose momentum appears to be unstoppable and scarcely able to be influenced, at least in the short term, but which have repercussions on companies, sectors, whole countries, and therefore on the capital markets as well. You, dear clients, like us, are affected to a significant extent by these trends on various levels. It is for this reason that we are planning to devote more attention to these topics in future, our rationale being that understanding megatrends and the opportunities and risks bound up with them can be of help when analysing business options especially in the current, highly volatile, market environment and in the face of a short-term and medium-term economic outlook that is fraught with a great deal of uncertainty. This publication seeks to introduce you to what is a new field of analysis for BayernLB Research. We will be committing more resources to analysing megatrends and tracing their implications for economic and financial-market developments. The insights gained on this score will supplement the assessments and forecasts which we already generate and which you can, of course, continue to rely upon. We hope that this new additional tool will provide you with valuable information and would be very pleased to receive honest feedback from you about this new service.

BayernLB megatrend research

▶ We are not conventional futurologists, instead appraising megatrends from an economic and financial-market perspective

Futurology and megatrends are en vogue at the moment: one need only think of the topic of digitalisation. Given that we do not have proven expertise in the prospective-research field, we will continue to leave this domain in the hands of the futurologists. What we at BayernLB Research do have is proven expertise in terms of macroeconomic analysis, the assessment of country risks and sectoral developments and financial-market analysis. Our objective is therefore the following: to first single out the megatrends which are most relevant for the medium-term trend in the economy and on financial markets, and then to analyse the way these megatrends can be expected to play out and influence one another, largely basing ourselves here on the assessments of experts in the different spheres. In this context, the lion's share of our megatrend research will be geared to analysing and forecasting the knock-on effects of these trends on the way economies, sectors and financial markets shape up. We are planning to compile special megatrend publications at irregular intervals but will also be delving deeper into the influence exercised by megatrends in our regular publications.

The most important megatrends

▶ There is a broad spectrum of megatrends,…

The megatrend concept goes back mainly to the 1982 book "Megatrends“ written by the US futurologist John Naisbitt. Building on Naisbitt's work, futurology today construes megatrends as "long-term global trends“. However, opinions differ among researchers regarding the precise definition of the temporal dimension (how long is long-term?), the societal and geographical repercussions, and how such trends originate and unfold. At least there is a large degree of consensus about one set of factors: a megatrend should have a half-life of a minimum of 10-20 years, should lead to radical societal, economic and political changes, and should initially unfold slowly but then gain momentum and also be able to cope well with temporary setbacks. Both the number and the semantic range of megatrends differ depending on the research institution involved.

In the first part of this study, we will be presenting the topics which we define as megatrends relevant for developments in the economy and on financial markets. We initially approached this theme with the help of Germany's Institute for Trend and Future Research (itz), which defines 15 megatrends. These we then investigated with a view to ascertaining their relevance for the medium-term trend in the economy and on financial markets. In parallel to this, we asked ourselves whether there were other developments from the financial-market perspective which might fulfil the criteria for being a megatrend. To remain as focused as possible, we finally narrowed the search down to the following six megatrends. The decisive factor governing selection was how heavily German companies, including banks, are affected by these trends.

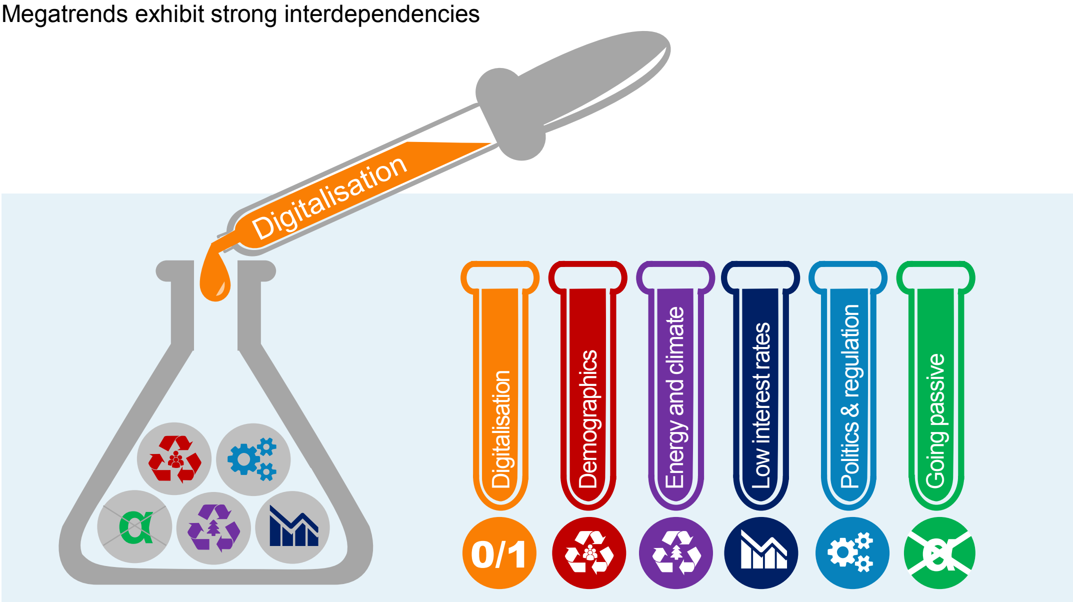
- … and we are concentrating on those - described in the first part of this study - which are relevant for the economy as well as for financial markets

0/1	Digitalisation
	Demographic change
	Energy and climate change
	Low interest rates and high debt
	Political framework and regulation
	"Going passive"

- It would be wrong to look at the individual megatrends in isolation

Where the first three of these trends are on the radar screens of all futurologists, albeit perhaps in a slightly different form, the other ones in our taxonomy make more of an exotic impression. However, we are of the opinion that these topics too qualify as megatrends on account of their potential implications for developments in the economy and on financial markets. We regard our six megatrends as parent categories under which a large number of megatrends (including ones identified by "genuine" futurologists) can be subsumed. For example, the frequently mentioned megatrend urbanisation, like the topic of health-care, can be assigned to the "demographic change" category. Megatrends do not evolve independently of one another and there are therefore a number of cross-connections and mutual interdependencies (cf. the chart below). By way of illustration, there are lots of links between the megatrend low interest rates and high debt and the trend of changes in the political framework and regulatory parameters.

Megatrends exhibit strong interdependencies



Source: BayernLB Research

Repercussions of megatrends on financial-market and economic factors

▶ The second part of this study summarises the importance of megatrends for the various asset classes

In the second part of this study, we will be turning to the repercussions of the megatrends we have identified on developments in the economy and on financial markets. We will begin by providing an overview of the impact which these megatrends will have in the medium term on the various asset classes as well as on country and sector allocation. The next step will be to sketch the influence of the megatrend which is most important in each case on every one of these financial-market and economic factors.

▶ Implications of megatrends on the economy mainly in the medium-term…

Given the long-term nature of the effects generated by megatrends and of the fact that different trends occur simultaneously, it is difficult to obtain empirical evidence of the impact on short-term developments at the aggregate level. At the corporate level, however, the resonance of such trends can already be felt in the short run, for instance when a digital innovation destroys the business model of a company or a whole sector, with start-ups successfully positioning themselves at the same time. Even over a medium-term horizon (up to five years), it is still difficult to prove the influence of megatrends at the aggregate level. Nevertheless, it should already be possible over such a time horizon to detect clear indications of the way megatrends are affecting the growth potential of individual economies and sectors or developments on financial markets.

▶ …but in some cases effects materialise in the short-term.

The time horizon over which megatrends unfold their effect may differ greatly. Where some changes to political and regulatory framework conditions show up more or less overnight at the level of asset allocation, palpable repercussions are only likely to materialise in other domains over the space of decades. Even in the latter case, however, this may already have a bearing on today's investment decisions. Were lenders or rating agencies to adopt a reserved stance when granting loans or awarding credit ratings because a particular megatrend was expected to have negative repercussions on the longer-term development of companies or countries, this could already make itself felt at once through an upward shift in risk premiums or through the tightening of financing conditions via a different channel (e.g. a switch to short maturities only). Under such a scenario, the future repercussions of a megatrend would already have a distinct impact on investment decisions straight away.

0/1 Digitalisation: the game-changer

"Anything that can be digitalized will be digitalized:" this statement by Carly Fiorina, the former CEO of HP, basically says it all. Digitalisation is the megatrend par excellence, conquering all areas of life and altering our economy to a scarcely imaginable degree. The buzzwords standing for these changes are Industry 4.0, Big Data and cloud computing. The transformation of analogue information into data and systematic utilisation of the latter do admittedly entail unmistakable potential risks but also unheard-of opportunities for every individual, company, and sector as well as for whole countries.

- Digitalisation is calling conventional business models into question

By now, it is hardly possible to imagine our private lives without digitalisation (one only needs to think here of the options opened up by smartphone use) and it is making ever greater inroads into companies and administrative bodies as well in advanced economies. New start-ups - and above all US technology giants - with their service-based business models are deploying disruptive innovations in ever more sectors in order to mount an assault on corporations which are still lingering in the "analogue world." Data is the raw material of the future. By skillfully making use of it through Big-Data analyses in real time and by resorting to sophisticated algorithms, such players are able to attack the business models of entire industries. When it comes to digitalisation, the value added for the customer is always the top priority: what provides additional utility for the customer is made possible by technology. For example, the financial sector is being increasingly sniped at by more lightly regulated FinTechs which employ user-friendly apps to provide services which used to be the exclusive province of banks and insurance companies. The online currency Bitcoin, which is based on the blockchain technology, could bring about a paradigm shift in the financial system, replacing conventional payment traffic through a decentralised booking system providing fully automated processing of standardised contracts. App technology has sharply increased the speed with which innovations penetrate economic life and society in general, and US technological corporations with deep pockets are continually expanding their sphere of influence by taking over and integrating start-ups.

Key to digitalisation is the storage and utilisation of huge data volumes

- Industry 4.0 is revolutionising the value-added chain

Key to digitalisation is the transformation of analogue information into storable digital data. Given that the data volume being used is increasing exponentially due to the omni-availability of the internet, digitalisation would hardly be conceivable without fast broadband networks, cloud computing and Big-Data analyses. Cloud computing (i.e. internet-based use and storage of data and software) and real-time analysis of immense data volumes are regarded right round the world as a huge growth market. Technology and telecoms companies are increasingly gearing their business models to these trends. The principal growth driver for cloud computing and Big Data is the digitalisation of value-added and production chains (Industry 4.0) and the communication between machines which is necessitated by this ("M2M“). A very important role is played here by cyber-physical systems (CPS), which are microchips embedded in everyday items that are capable of communicating with one another via the internet. The number of internet-connected devices is forecast to shoot up from 9 billion units (2012) to more than 25 billion by 2020.

- Digitalisation enables new service-based business models

The digitalisation of the entire production, delivery and distribution chain makes it possible for industry to use Big-Data analyses to reveal the optimisation potential along the whole value-added chain. For this to work, "upstream" and "downstream" value-added partners need to be digitally connected with the company concerned. Provided that all partners right across the value-added chain grant each other access to their data, the digitalisation of production ("Industry 4.0“) enables new service-oriented business models to be established. In accordance with this, companies can offer their clients such services as prospective remote maintenance for machine parts threatened by wear so as to minimise maintenance-related downtimes. In the process, the manufacturer strengthens customer loyalty, while the parts supplier does not need to carry so much inventory and can optimise his capital tie-up. Final customers, in turn, are in a position to use, and pay for, the machinery in a demand-related fashion, which reduces their investment requirements. Financing requirements are shifted to the manufacturer to a greater extent.

▶ There is still scope for action in the data-protection sphere

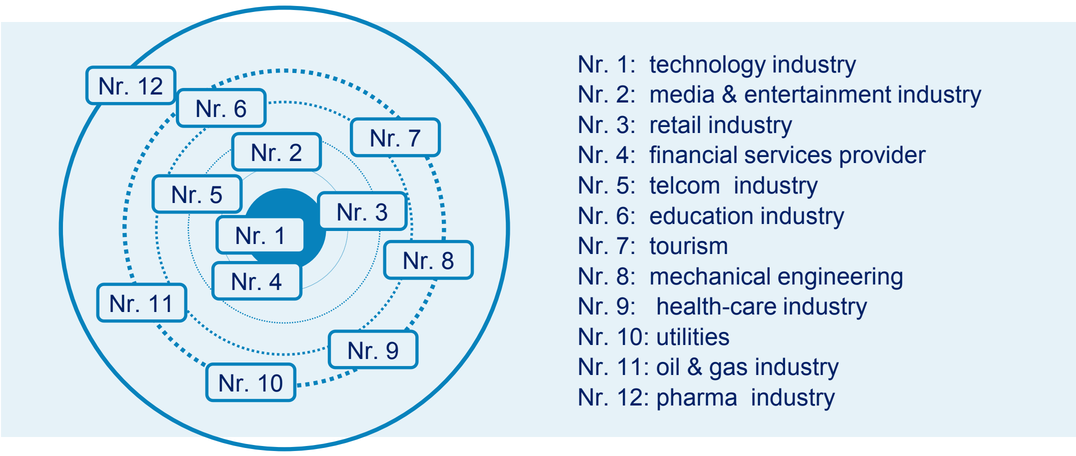
Safety from cyberattacks and espionage is a fundamental prerequisite for the success of digitalisation in the economic and administrative context. Both these phenomena have grown exponentially over the past few years. From the point of view of companies, data security must therefore be viewed as the top priority. There is still a lot of scope for action on this score, at small and medium-sized companies in particular. Digital transformation of business processes and business models requires a clear legal framework regulating who is allowed to use what data how and when. Only further training and advanced education can prevent the scenario forecast in numerous studies: the disintegration of the world of work into winners (IT developers and users) and losers (workers whose simple activities become automated thanks to digitalisation).

Disruptive innovations are attacking conventional business models

▶ The technology, media and retail sectors are most at risk

Where the step from the long-playing record (LP) to the CD was still evolutionary from the point of view of business with music-storage media, the shift from the CD to internet-based music streaming has to be described as disruptive because streaming is attacking the business model of physical sound-storage media. More than ever before, companies are obliged to monitor whether their business model is going to still be viable in future. This also has implications for banks' risk assessment of financing. An investigation conducted across 13 countries by the Global Center for Digital Business Transformation, with 940 respondents from 12 sectors, has come to the conclusion that the industries most heavily affected by disruptive developments in the period to 2020 will be the technology, media and retail sectors, with the "assailants" usually deriving from the sector in question. It is therefore to be expected that, on average, four of the leading companies in a sector will forfeit their strong market position.

The aftermath of digitalisation: Danger of disruptive developments in the period to 2020, by sector
from No. 1 most endangered to No. 12 least endangered



Source: BayernLB Research

Digitalisation is capable of unlocking immense opportunities for companies, sectors and entire countries. It is transforming everyday life and revolutionising the economic world by subjecting the whole of an economy's value-added chain to a radical review. And everything that we know so far is presumably only the very beginning of the megatrend that goes by the name of digitalisation.

Demographics: caught between refugee crisis and population aging

The demographic changes due to occur in the coming decades can now scarcely be influenced any longer. The consequences of previous policy decisions will only be felt in the long term. It is therefore all the more important to steer the consequences of the process of demographic change by taking forward-looking action. Both businesses and politicians are being confronted by major challenges in many countries - not only by global population growth but also by topics such as population aging, urbanisation and migration flows.

The focus is on political crises as a driver of migration

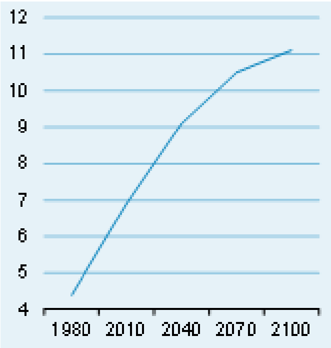
- Nearly 60 million people are fleeing on a world-wide basis

Migration movements have taken place in all epochs, but migration only evolved into a mass phenomenon after the advent of the industrial revolution. Prerequisites here were the creation of industrial jobs and the improvement of transportation routes. Apart from economic asymmetries (wealth, education), environmental influences (desertification, rising sea-levels), political conflicts (wars), ethnic and religious conflicts as well as a lack of political freedom are regarded as key drivers of migration. On a global scale, nearly 60 million people were fleeing from wars, conflicts and persecution in 2014 (more recent figures are not yet available). This is the highest number ever registered by UNHCR, the United Nations Refugee Agency, breaking down into approximately 20 million refugees, 38 million people forced to flee inside their own countries and a little less than 2 million asylum-seekers. What is more, there are no signs of the flood of global migration slowing to a trickle. At least 14 fresh conflicts have erupted or flared up again world-wide over the past six years – eight in Africa and three in the Near or Middle East. Quite apart from acute crisis situations, the consequences of climate change are going to ensure that ever more people leave their homes in the medium to long term. At the present point in time, 3% of the world's population live outside their native country as international migrants (refugees, asylum-seekers, migrant workers). Of these, around 45% are residing in either the EU or North America. It is true that east-west movements or migration within continents also occur; but it is an observable fact that net migration flows tend to move from poorer continents to more affluent, highly-developed and political stable nations. At the present juncture, the focus is, for the most part, on Europe as the preferred target region for many refugees from the crisis areas in the Middle East and North Africa. The EU did not register such a large inflow of migrants even during the Balkan wars of the early 1990s on the territory of ex-Yugoslavia as it did in 2015. The most popular target land is Germany, which saw around 1.1 registered immigrants arriving last year.

- Urbanisation: An ever larger proportion of mankind is living in urban areas

Alongside migration between countries and continents, internal migration is also taking on ever larger dimensions. A symptom of this is progressive urbanisation: where approximately 53% of the world population were living in city-areas in 2013, the 2030 figure is projected to be almost 59%. The UN predicts that more than two-thirds of the 15 largest urban agglomerations will be in Asia by then - the largest being Tokyo, with only a shade less than 39 million inhabitants. Even today, there are 30 mega-cities (i.e. with a population of more than 10 million) world-wide, and this figure is poised to have increased to 41 by 2030. Such cities are faced with immense challenges if they are to do justice to the influx of ever more people and to their demands in terms of quality of life. For example, it is not only transport and mobility which have to be safeguarded but also waste management and energy supply. What is more, we are going to see an increasing number of cities in future which have more inhabitants than many fully-fledged countries but without their interests being represented in international organisations.

World population: Growth momentum is waning
(billion people)



Source: UN

The advanced economies are slowly "greying"

The allocation of resources is going to play an ever more important role in future, at an international level too. Planet Earth is currently home to 7.3 billion people, and the UN calculations conclude that the 10-billion mark will be reached in 2055. The size of the world population is therefore set to continue increasing, albeit with waning momentum. The decisive determinants here are the birth rate and life expectancy. In the advanced economies, the birth rate is destined to decline further along with the overall population total whereas the least-developed economies are experiencing furious population growth, above all because of the increase in life expectancy. The world's regions are drifting apart not only with regard to these two factors (which are factors that can be influenced by framework conditions such as the wealth level, the level of support from pension and social-security systems, the health-care system or environmental conditions) but also from the point of view of median ages: where the median age in Niger is slated to be 15 in 2030, the UN is forecasting a median age for Germany of around 49.

Countries with young populations ought to seize their opportunity and put their large cohort of young workers to economic use before they begin ageing. In many poor nations, excessively high birth rates are impeding success on the development front. If such nations manage to reduce their birth rates quickly and to initiate a demographic transition, they have a chance of receiving a boost to their economic development. This bonus is provided by a population in which the number of employable persons is growing faster than the number of dependent children and senior citizens. In such a situation, one speaks of a demographic dividend. For this dividend to be "paid out," it is necessary to put in place framework conditions such as efficient, universal education and health-care systems as well as a stable legal regime. And it should be noted that there is only a limited time-window here: the Asian tiger states (South Korea, Singapore, Taiwan and Hong Kong) made use of theirs in the 1970s.

- Many advanced economies ought to promote carefully-targeted immigration

Ageing societies like, for example, Germany or Japan are being confronted with very different challenges; the welfare state is increasingly bumping up against its limits, an increasing number of qualified staff is needed in the nursing-care sector, and both the product range of companies and workplace configurations need to be adjusted to suit the needs of a greying population. This all involves considerable costs and has knock-on effects on growth, public finances and corporations. Even if measures are taken to spur fertility rates, the trend towards an ageing society is still irreversible in most advanced economies.

The economic and political worlds are being confronted with major challenges

Demographics does not only influence the long-term social and economic development of a given city, country or entire continent (GDP, indebtedness, unemployment rate) but can also lead to shifts in power within societies (national as well as international). The consequences of an ageing society are also palpable on a sectoral level: the health-care sector will gain in importance while the toy industry, for example, will play an ever smaller role. Social-security systems based on the "pay-as-you-go" principle will bump up against capacity constraints while private (old-age) provision will become more important. Population aging and shrinking will also confront providers of local-authority infrastructure with major challenges (pension liabilities, barrier-free access, etc.). If they are to maintain their level of affluence, it is imperative that aging societies promote immigration - especially the carefully-targeted immigration of qualified individuals. This could at least alleviate the consequences of demographic change.

Energy and climate change: major changes up ahead

Global warming due to greenhouse gas emissions is giving rise to mounting pressure for change on a world-wide basis. The Climate Change Conference held in Paris in December 2015 was regarded in many quarters as a successful breakthrough and has sent out an unambiguous signal about combating global warming. A new global climate agreement has been promulgated, the aim being to limit global warming to less than 2 degrees Centigrade and possibly to just 1.5 degrees C. Global net greenhouse gas emissions are to be reduced to zero in the second half of this century. At the next energy conference, due to be held in Marrakech this November, financial assistance is to be provided to developing countries to enable them to attain the climate targets agreed on. This means that the topics of energy security, global warming and greenhouse-gas reduction are going to be right at the top of the international political agenda in the years ahead.

- Use of renewable energies and resource efficiency are national drivers

The necessity of global cooperation on environmental protection is not the only factor driving change. Using energy as carefully as possible also confers advantages from an operational point of view. Energy efficiency but also sustainable management are hot topics above all in highly-developed countries, not least in Germany. After all, increased utilisation of renewable energy sources leads to a lower level of import dependency. At the same time, the processes of change which have been initiated constitute a major challenge for conventional energy utilities, municipal energy suppliers and suppliers of large-scale power plants.

Although it did so in Germany, the reactor accident at Fukushima did not result in a fundamental change of direction for energy policy in many countries. On the other hand, the fact that Germany's nuclear reactions are now going to be shut down ahead of time means that a supply gap could occur which - if it does occur - would have to be plugged, on the one hand, by not very environmentally-friendly coal-fired power plants and, on the other hand, by renewable energies (wind, solar and biomass), the expansion of which is currently being promoted. The amount of energy gained from wind-energy or solar plants fluctuates according to meteorological conditions, making additional energy-storage facilities necessary. Outside Germany, the focus continues to be on nuclear energy, the use of which - according to this energy source's advocates - makes a substantial contribution to reducing the global warming caused by greenhouse gas emissions.

Shifts on the supply side in the case of fossil energy sources

- Fossil energy sources are losing in importance in highly-developed countries

The energy supply determined by fossil fuels has been perceived to be a limiting factor in recent decades. The flashpoints here were the supply crises of 1973 and 1979/80. The supply side is relatively rigid because it takes a lot of time and money to explore and exploit new deposits. The oil-producing states, the majority of which are politically instable and are ruled by governments which lack democratic legitimacy, currently still control approximately three-quarters of the aggregate supply of fossil energy sources. Not least in view of this fact, the developed countries are adopting measures designed to make them more self-sufficient so that they may perhaps even be able to export energy one day. Above all the USA is heavily committed to this task. However it is unclear at the moment whether - and, if so, to what extent - the expansion of unconventional production (fracking) can succeed with oil prices persistently low. What is easier to recognise is that the OPEC cartel is losing even more of its importance. The political instability afflicting the Near and Middle East is making countries such as Saudi Arabia more willing to continue producing at a high level.

Boosting energy efficiency

▶ Lower consumption and mounting innovative pressure

Framework conditions and regulations have been amended in the developed countries to enable more efficient utilisation of energy and to reduce environmental pollution, a German example being the Renewable Energy Law (EEG). At the same time, there is evidence of mounting innovative pressure, being brought to bear, on the one hand, by internet service providers interested in the commercial use of energy data and, on the other hand, by the government-supported trend towards digitalisation in the energy sector. The focus is also on efficiency improvements and flexibilisation measures.

▶ The influence of 'rogue states' is on the wane

On the one hand, geopolitical risks are diminishing thanks to the dwindling share of 'rogue states' in the global energy supply. On the other hand, energy-intensive heavy industry is losing in importance in the developed countries. Decentralised solutions (involving consumers becoming producers), sustainable forms of renewable energy, and measures to get rising energy consumption under control are swimming into focus. These trends, which are pleasing from the point of view of the advanced economies, are being counterbalanced by the economic problems posed for producer countries by the low prices for traditional energy sources (oil). Experience shows that such commodity crises can take a significant toll on financial markets. On a medium- to long-term horizon, the further decline in the oil dependency of highly-developed nations and the already delineated efforts countries are making to gain energy self-sufficiency, e.g. in the USA, can be expected to put downside pressure on the price of energy sources.

▶ Renewable energies are gaining in importance not only in Germany…

Some years ago, the prospects for renewable energy sources in Germany were still a matter for dispute. By virtue of substantial subsidies and infrastructure investment, the share of electricity generation accounted for by renewables has already climbed to 30%. However, massive further investment is needed to safeguard Germany's "energy turnaround" in a lasting manner. At the same time, subsidy policy needs to be adjusted further. It is true that this policy has made it possible for German companies to play a pioneering role in the alternative-energy field and that this is increasingly having an effect on the export side as well. However, the way subsidies are structured does little to promote innovation and the way they are financed entails a number of negative side-effects.

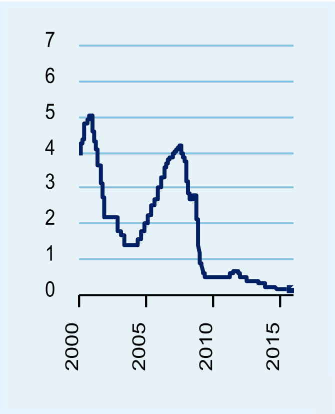
▶ …but also on a world-wide basis

The contribution made by renewable energy sources is bulking larger outside Germany as well, flanked not least by more stringent climate-protection targets. Such targets are being accompanied by national developments. For example, smog pollution in Chinese cities is a growing problem which needs to be solved, partly by constructing filter plants and by putting more electric vehicles on the roads. A positive side-effect of the shift in the global agenda in favour of renewable energy providers is that energy will presumably become more easily available and will also be cheaper to procure if efficiency reserves are utilised. The focus continues to be on the change in consumer behaviour, decreasing resource consumption and the commercial use of consumers' energy data. On the back of progressive digitalisation, a disruptive shift looks to be taking shape in many energy-sensitive domains: the concepts 'electromobility', 'smart city' and 'smart home' should be mentioned in this context. Consumers' energy data are morphing into the key for new business models pursued by internet service providers.

Low interest rates and high debt: an enduring and global phenomenon

At the latest with the outbreak of the financial crisis in 2008, low interest rates and high debt morphed from a temporary, regional or sectoral issue into an enduring and global phenomenon. Being central determinants of the solvency of banks, companies and households as well as of portfolio returns, these two factors constitute, in our eyes, a mega topic for the coming years - not least because the repercussions of such phenomena are sometimes only felt with a considerable time-lag. What is more, the distribution effect deriving from them is potentially politically explosive.

Lasting low-interest-rate policy
Key policy rates (US, ER, UK, JAP) in %



Source: BayernLB Research

Low interest rates: Caused by crisis-management policy and structural shifts

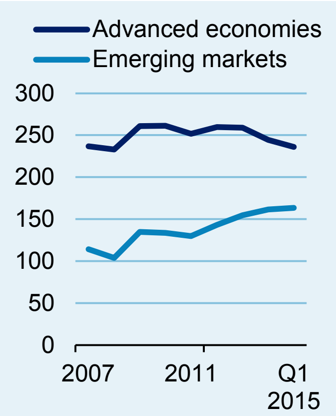
Several factors are responsible for the current extraordinarily low level of interest rates. The focus here is on the central banks which have kept their policy rates at extremely low levels since the onset of the economic and financial crisis in 2008/09, additionally depressing longer-term interest rates through quantitative easing in a bid to overcome the sluggishness of demand. Given that inflation expectations continue to be very low, a swift exit from the current ultra-expansionary monetary-policy stance is highly unlikely. This all the more as central banks see asymmetrical risks looming over their monetary-policy decisions when interest and inflation rates are close to zero. The high level of public and private debt is another argument against a quick exit from this policy because the adverse economic effects of rising interest rates would be much more significant - due to the resulting shortfall in demand - than in the past. In case of individual central banks, the fact that the stance is highly accommodative globally is making an exit scenario harder to implement: even though the domestic interest-rate level is being kept low by global forces, an undesirably sharp tightening of monetary conditions can occur via the exchange-rate channel. Last but not least, the low level of central-bank interest rates is suiting politicians very well in a number of countries, enabling them, for the time being, to avoid taking the unpopular step of resorting to open taxation to scale back the pile of public debt.

Global real interest rates have been in reverse since 1990
10-year real interest rates, G7, median in %

Source: BayernLB Research

On the other hand, central banks can only partly be held responsible for the low level to which market interest rates have fallen. Another determining factor is the decline in natural interest rates - i.e. the portion of the interest-rate level which cannot be influenced by monetary policy - which has been triggered by structural shifts. This development already began to take shape in the mid-1990s and has increasingly gained momentum. Exiting the expansionary monetary policy will probably not reverse this trend on its own. This is because the decline in the natural rate of interest is being caused above all by a higher propensity to save (in emerging markets in particular) and by a lower propensity to invest (in advanced economies in particular). The rise in the global propensity to save is being driven by demographic developments (above all increasing population ageing), mounting income and wealth inequality, China's progressive integration into financial markets and the ongoing deleveraging process after the financial crisis. The decline in the propensity to invest is being driven partly by the demographic trend but mainly by the decrease in the rate of technological progress. The propensity to investment is also being crimped by structural changes in global growth-drivers (the shift from the secondary to the tertiary sector) and by a decline in the relative price of capital goods as well as by lower demand for the latter. A last factor contributing to the decline in the natural rate of interest is the increasing scarcity of risk-free assets. The ongoing deleveraging process in the public and private sectors of countries with strong creditworthiness and worsening credit ratings for numerous issuers in crisis-ridden nations are limiting supply. Demand is being driven by tighter regulation, a diminished appetite for risk on the part of investors, and central banks' asset-purchasing programmes. None of these developments is a purely temporary phenomenon, which dims the prospect of higher long-term interest rates.

Debt levels are still excessive
Public, corporate and household debt as a percentage of GDP



Sources: BayernLB Research

Global indebtedness: No signs of the mountain being chipped away at

Global indebtedness has hardly declined after its sharp increase in the years prior to and after the financial and economic crisis of 2008/09. It is true that a number of advanced economies have made (in some cases, considerable) consolidation efforts. However, these have been offset by a marked rise in debt ratios in emerging markets (above all in the corporate sector). The high level of indebtedness implies that economic activity and debt sustainability are highly sensitive to the interest-rate level. Even a moderate increase in global interest rates would have significant negative consequences. Reducing debt ratios is therefore a prerequisite for a (once again sustainable) higher interest-rate level. But the path to this goal is a painful one because all the options available entail considerable negative side-effects: (1) progressive debt reduction through repayment; (2) writing down debt through insolvency; (3) higher inflation; (4) higher real growth; (5) debt mutualisation. Where the first two options reduce the numerator of debt ratios, options 3 and 4 bring relief thanks to a higher denominator. The final option is possible for individual actors/countries, especially in the euro area, but is not a viable approach globally. Depending on which option is adopted, substantial consequences would probably be on the cards for individual market segments/sectors or indeed for the economy as a whole.

Which areas are affected?

- Business models and investment strategies are being fundamentally called into question

The trend in interest rates and the ways out of the debt trap result in immediate redistribution effects between creditors and debtors. Financial intermediaries such as banks and insurance companies are being especially affected by this. Above all the protracted phase of low interest rates is causing the business model to be called into question in a number of areas. This is because it is only partly possible to make up for the downward pressure on margins through cost reductions. However, fundamental questions are also arising regarding the structure of future portfolios and asset allocation, especially in the case of investors heavily focused on debt instruments: after all, it is going to hardly prove possible in the future to generate a lastingly positive yield via top-rated bonds. When it comes to appraising higher-risk assets, assessments of public and private debt sustainability are going to attain an even greater importance.

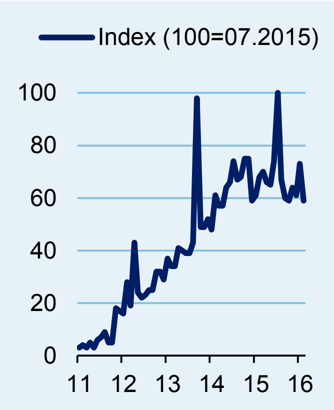
- The adverse impact of low interest rates is only going to be felt with a time-lag

On the macroeconomic side, the focus is on when, and how, the low-interest-rate policy can be exited as well as on the interest-rate level that is going to be normal in future. On the distribution side, the big questions are how to achieve optimum savings and the redistribution effects between generations, between deficit and surplus countries or between the public and the private sector. As to possible ways out of the debt trap, extensive debt remission, above all in the public sector, is a serious option not only for euro-area countries. Within the EMU, the question arises as to whether or how the financial system can be made weatherproof to be able to absorb such a step. In our view, capital requirements for government bonds and an insolvency mechanism for states are necessary premises on this score. From the market point of view, the question is when these developments will move into focus. Even though a number of aspects still look a long way off, it would still be wise to prepare for them now. This is because the violent impact of low interest rates on economic life is presumably only going to be felt with a significant time-lag. Fundamental changes are to be expected at banks and insurance companies in particular.

Political framework and regulation: no new trends

The political framework conditions and regulation are (to paraphrase the German novelist Fontane) "too broad a field for easy answers“. These are vague, nebulous terms which - in contrast to most of the other megatrends presented here - do not describe a new development. We define political framework conditions as the key cornerstones for social action posited by the political class. In this context, regulatory parameters are to be construed as one aspect of these framework conditions, being defined as specific legal provisions and legislative measures. If these terminological definitions are used as a basis, the political framework and regulation have existed since the dawn of civilisation since they are invariably needed whenever it is a question of regulating the communal life of a community.

Crowdfunding is a new IT-based competitor
Google search results "crowdfunding“



Sources: Google Trends, BayernLB Research

Why are we occupying ourselves with this issue?

If these topics are so time-worn, why do we regard them as a relevant mega-trend? One of the reasons that political framework conditions have gained a far higher profile is the increasingly globalised and complex economic world in which they are operating and that the pace at which they are changing is increasing steadily. Various topics can be subsumed under this heading, stretching from international trade agreements to landmark monetary-policy and fiscal-policy decisions (such as the ECB's OMT programme) or to the question of the EU's political cohesion. Against this backdrop, the topic of regulation has become a great deal more important and intricate over the past ten years. Where individual segments of the financial sector were subject to specific regulatory provisos prior to the financial crisis, the entire industry is now extensively regulated, with corresponding implications for the business models of banks and other financial intermediaries. Moreover, political framework and regulation are connected with other mega-trends. For example, the mega-trend of digitalisation is creating new business models and options (e.g. crowdfunding, cf. the chart) which are competing directly with conventional banking business while being far more lightly and patchily regulated because regulation is lagging behind innovative technological developments.

▶ Political and economic systems, treaties and agreements, and the provision of public goods - all these items fall into the category of political framework conditions

More concretely: the various component parts of political framework conditions

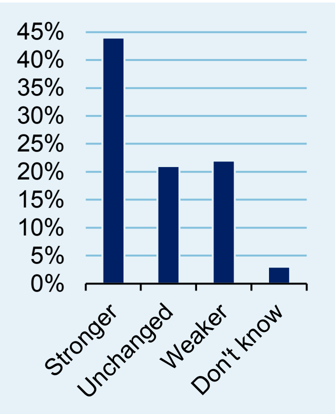
From the point of view of the economic world, political framework conditions are determinants which externally influence markets and companies alike but which cannot be directly influenced by individual economic agents. These determinants include **the political system, the economic system**, along with **treaties and international agreements,** but also **the provision of public goods**. The **political system** issue is about more than the question whether a given company is operating, for example, in a democratic or authoritarian system. It likewise bears on the legal regime in a country which, in turn, has an influence on the issue of corruption. The evolution of political institutions, e.g. the shifting balance of power between them, likewise alters the environment for corporations as for households. In this connection, we have been seeing a growing trend towards nationalisation, which involves a given population putting a far greater emphasis on their own national interests than on supra-national interests. Cases in point are the Brexit referendum and the election successes scored by nationalistic parties in many European countries. The **economic system** is closely meshed with the political system because it is at this level that the question "market economy or planned-economic system?" is answered. The heading **Treaties and international agreements** makes one immediately think of the international trade agreements which are currently being negotiated: TTIP (USA-EU) and TPP (USA-Pacific-rim states). But is also raises the question of the extent to which treaties are adhered to and whether contractual penalties are actually enforced. The **provision of public goods** is another important aspect of political framework conditions, especially from the economic point of view: after all, good infrastructure or favourable education systems can be the make-or-break factor governing investment decisions.

Regulation and its application in practice

- Banking regulation determines competition between banks and other rivals in the sector

Alterations to the regulatory landscape are a factor which is particularly in focus in the financial world for such alterations definitely have the potential to change entire business areas in a fundamental way. Regulations are legislative measures designed to influence the behaviour of economic agents with the aim of correcting, or indeed preventing, undesirable market results. Where the classical definition is between market regulation, price regulation and the regulation of behaviour, we differentiate between regulatory stipulations for banks and other financial-market actors and regulatory stipulations for non-banks. The former category includes new regulatory requirements such as Basel IV or MiFID II. The focus here is on whether - and, if so, to what extent - business models are going to be changed by the new regulatory demands. A decisive role is being played in this connection by new market entrants, including ever larger competitors from the shadow-banking system as well as such new "kids on the block" as FinTechs. Both of these groups are benefiting from considerably less stringent regulation.

Stronger regulation is wished for in the health-care sector
% share of respondents, cut-off: 2013



Sources: statista.com, BayernLB Research

Non-bank regulation is concerned with the regulation of individual markets and their ramifications. For example, the Chinese equity market is extremely heavily regulated, with only a small portion accessible to foreign investors. At the same time, China's equity market is one of the factors which triggered the turbulence on international financial markets in recent months. However, regulation is also crucial in the case of non-financial sectors. For instance, far-reaching provisions are in place in the labour and environmental-protection spheres, and particularly in the health-care sector. In Germany alone, there have been no fewer than eight health-care reforms, whose provisions had to be implemented, over the past 16 years. Where earlier reforms were focused on cost-cutting in particular, the most recent measures have concerned structural reforms designed to promote competition but also the question of health-care financing in a society getting greyer by the day. The population's opinions about how much state influence there should be on the health-care system differ greatly: at least in 2013, as many as 44% of respondents to a survey still wished for even stronger state regulation in this sphere (cf. chart).

All economic areas and asset classes are affected

- Political framework conditions and regulation determine the scope for action available to each and every economic actor

Political framework conditions and regulation affect virtually all economic areas. For example, international political agreements are a factor governing a country's budgetary policy (cf. the Maastricht criteria in the euro area) and are thus relevant both macroeconomically and in the eyes of the markets. The credit rating of a country hinges to a decisive extent on the respective political framework conditions. Political decisions can determine the development in a whole sector (cf. Germany's energy turnaround, car-scrapping premiums, health-care reforms) and thus have a bearing on asset allocation too. Regulation, in turn, along with the persistent low-interest-rate phase, is calling the business models of banks into question and has gained exponentially in importance above all in the financial-intermediary field. Given that political framework conditions and regulation thus keep materialising in ever new forms, they are set to remain a determining trend in future too.

"Going passive:" paradigm shift in the fund industry

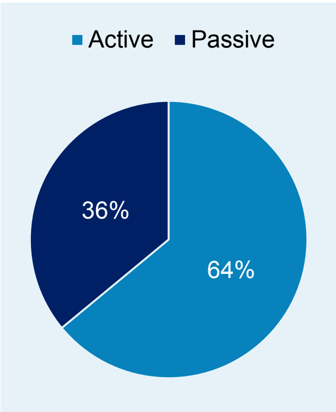
A securities portfolio can be managed actively or passively. When a fund is actively managed, an attempt is being made to achieve an excess return through deliberate stock-picking and market timing. If a passive investment-management approach is adopted, on the other hand, all that happens is that an index is invested in which mirrors the broad market in the segment in question (e.g. the DAX in the case of German equities). Active selection or the overweighting of particular securities are consciously dispensed with under such an approach. "Going passive" describes the trend away from active and towards passive fund management.

▶ The merely modest success of actively-managed funds is promoting the process of "going passive"

High capital-market efficiency makes the passive investment approach attractive

A passive investment approach makes sense from the investor's point of view if the efficient-market hypothesis is valid. This postulates that all publicly-available information has already been factored into the prices of the asset concerned and thus that no investor can generate an outperformance through using such information on the capital market (semi-strong version of the efficient-market hypothesis). If this hypothesis is valid, active investment management will be unable to generate an excess return in the longer term. Empirical studies for the most part confirm the high degree of information-processing efficiency on financial markets. It is therefore extremely difficult to perform better than the respective benchmark index on a lasting basis by means of stock-picking and market timing (especially if transaction and management costs are counted in). Investigations by Standard & Poor's into the performance of investment funds corroborate this finding: it turns out, for example, that 97% of all global equity funds underperformed the benchmark (the S&P Global 1200 Index) over a five-year period (cut-off date: year-end 2014).

US mutual funds: A large proportion are passively managed
Share of actively- and passively-managed funds in the US equity fund market (incl. ETFs) as of 31.7.2014



Sources: Morningstar, BayernLB Research

The passive approach to investment is on the advance

The proportion of passively-managed funds in the mutual-fund market as a whole is noticeably increasing, with this trend originating in the USA. Rather more than one-third of the equity-fund market (conventional mutual funds plus ETFs) now involves passively-managed products in the United States; in the fixed-income-fund segment, the proportion is, as yet, lower, at just below 20%. However, passively-managed products are already well out in the lead with respect to net inflows, the inference being that their share of aggregate assets under management is bound to rise. Where passive products have already been dominant in terms of net inflows for eight years now in the equity field, they have only been ahead of actively-managed funds for two years in the fixed-income segment.

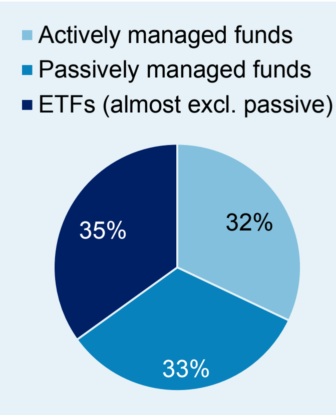
It should be noted that using passively-managed investment products does not necessarily force investors to do without active management completely. Many investors owning passively-managed investment products are probably pursuing an active asset-allocation strategy, dispensing, it is true, with active stock-picking but actively selecting and weighting certain market segments.

Do passively-managed investment products entail financial-market risks?

Implementation of passive investment approaches is increasingly involving not only conventional investment-fund vehicles but also exchange traded funds (ETFs). As a rule, ETFs aim to replicate the yield trend of a diversified reference portfolio (index) as precisely as possible. Usually, ETFs (like investment funds) certify ownership of units of special assets ring-fenced from other assets of the issuing company. However, ETFs offer a number of advantages over conventional funds such as low costs and intraday tradability on stock exchanges. In the case of an ETF, replication of the target index can take either a physical or a synthetic form. In the case of physical replication, investment takes place directly in the securities making up the index. In the case of synthetic replication, the portfolio which is put together will deviate from the target index, with completely different securities being selected in some cases. Under this model, swap operations with third parties take place additionally in order to enable the performance of the benchmark index to be replicated.

US fund market: Passive products are to the fore in terms of inflows

Share in net sales of ETFs and investment funds in the USA in the twelve-month period 7/2013 to 6/2014



Sources: Morningstar, BayernLB Research

The widespread diffusion of passive ETF products poses a number of potential risks for financial markets. This probably affects equity markets most in the first instance because it is in that segment that ETFs bulk largest. However, the proportion of passively-managed products is also on the increase in the bond and commodity markets, meaning that similar problems could crop up there too. A central risk is constituted by potential liquidity bottlenecks. Above all in the event of a "redemption run“ - i.e. if investors were scrambling to cash in their ETFs - ETF suppliers might well, due to insufficient demand, have problems selling the underlying assets quickly and meeting all ETF redemptions. This applies in particular in less liquid market segments. The apparently high liquidity levels of ETFs could prove to be deceptive in the event of ETF suppliers becoming distressed.

In the case of synthetic ETFs, there are also counterparty risks emanating from the swaps which are carried out in order to enable the return of the target index to be replicated. If a bank involved in swap business were to encounter problems, this could prove to be a source of contagion leading to systemic financial-market risks. Moreover, counterparty risks can also occur in the case of physically-replicating ETFs since these frequently engage in sizeable securities-lending activities in order to generate additional yield. It also seems conceivable that there could be potentially destabilising interactions between ETF-related risks and other financial-market trends (e.g. high-frequency trading).

Smart beta approaches are displacing active stock-picking

- The smart beta approach as an alternative to active investment management

As an alternative to active stock-picking, so-called smart beta approaches can be utilised - in the case of a passive investment strategy as well - to attempt to generate outperformance relative to conventional benchmarks. Beta denotes the market return resulting from passive investment in contrast to alpha, which denotes the (additional) return generated by active investment. Smart beta (also known as strategic beta, advanced beta, enhanced beta or engineered beta) encompasses portfolio concepts which are specifically geared to harvesting factor premiums through alternative weighting methods. The return produced by smart beta ought therefore to beat that achieved by "normal" beta. To that extent, smart beta concepts constitute a direct alternative to classic alpha-seeking investment when the objective is to outperform benchmark indices.

- Smart beta approaches are widespread above all in the equity field but are increasingly being used in other segments too

Typical smart beta approaches can be sub-divided into risk-oriented strategies (risk-minimising weightings) and performance-oriented strategies (e.g. weighing on the basis of fundamental parameters). Combinations of factors are also used. To date, smart beta products are mainly playing a progressively larger role in the equity field but an increasing number of corresponding fixed-income products are also coming onto the market. This is likely to further reinforce the trend towards passivity.

- Conventional fund providers and asset managers are under pressure

The trend towards "going passive" is going to engender major upheavals in the investment industry. Providers of conventional investment products are likely to come under increasing pressure since active management is no longer being remunerated as it used to be. ETF products are also well-suited to automated asset management based on algorithms (so-called "robo-investment advisors“). The latter amount to a major challenge for conventional asset managers and banks. For listed companies, it is becoming increasingly important to be included in the leading equity indices which are the point of reference for ETF products.

The importance of megatrends for the economy and for financial markets

▶ Influence of megatrends on the various asset classes

The value added which we at BayernLB are capable of generating derives from our analysis of the medium-term influence of the individual megatrends on the asset classes we track. A schematic presentation of this influence can be found in the table below, which does not offer a directional assessment but rather an evaluation of the degree to which the megatrend in question is important.

▶ No megatrend is unimportant…

It only takes a brief glance at our table to appreciate that we regard the megatrend "low interest rates and high debt" as by far the most relevant across all asset classes whereas the repercussions of the megatrend "going passive" are limited to just one portion of the financial market. This result is not surprising to the extent that low interest rates, above all, are the topic dominating the market and that this is probably going to remain the case in the years ahead. The runners-up are "political framework and regulation" and "energy and climate change," which are increasingly having a dominant effect on the behaviour of many market actors and on market-price formation. This does not, however, mean that the other megatrends can be neglected because these, although displaying a weaker resonance, will also be felt.

▶ … and no asset class can shield itself from the influence of megatrends

A comparison of the influence on the various asset classes reveals - just as unsurprisingly - that the high-beta instruments equities and corporate bonds are most affected by the whole range of megatrends. On the other hand, the strong influence of megatrends on government bonds makes it clear that safe havens are not resistant to change either and thus that none of the actors on the financial market should dismiss megatrends as ivory-tower phenomena but should rather grapple with their implications.

Overview: Importance of megatrends for individual asset classes

	Digitalisation	Demographics	Energy & climate	Low interest rates	Politics & regulation	Going passive
Equities	++	++	+	+++	+	++
Corporate Bonds	+	+	++	+++	+++	++
Covered Bonds	-	-	+	+++	+++	+
FX	+	+	++	+++	+	-
Real estate	+	+++	++	+++	++	-
Commodities	++	+	+++	+	+++	-
Government Bonds	+	++	+	+++	++	++
Sector allocation	+++	+	+++	+	+	-
Country allocation	+	+++	++	+	++	-

Extreme effect: +++; Very important: ++; Noteworthy: +; Peripheral: -
Source: BayernLB Research

On the pages which follow, we will be offering a closer description of the megatrends which are most important for the asset class in question and of their specific effect. We will be delving more deeply into this issue in the studies on individual megatrends which will be following the present publication. In that sense, our table and the brief delineations which follow are to be understood as appetisers.

Equities: will there be higher volatility because of megatrends?

▶ Low interest rates and high debt levels

The level of and trend in interest rates play an important role in equity valuation because the standard valuation methodology involves determining the value of corporate assets by discounting future cash flows to a present value. Ceteris paribus, lower interest rates and, by extension, lower discount rates lead to higher valuations for corporate assets. Against this background, an ultra-expansionary monetary-policy stance will lend support to equity markets, although it simultaneously stores up risks of a bubble forming over a longer period of time. At this point, the question arises as to the risks entailed for equity markets (danger of a crash) - and thus for the economy as a whole - when monetary policy is normalised at a later date. However, the causes of the decline in natural interest rates, such as a higher propensity to save and a lower propensity to invest - triggered, amongst other things, by the demographic development (population ageing) and by the decline in the rate of technological progress - have a negative impact on equity yields. What is more, low interest rates have a negative effect on corporate balance sheets: pension liabilities are inflated by the lower discount factors which they entail. As a result, the net effect of the low-interest rate environment on equity markets is less unambiguous than might appear at first glance. Furthermore, low interest rates have a heavy influence on individual sectors, especially on the business models of banks and insurance companies.

▶ "Going passive"

Passively managed investment products play a prominent role in the equity field and their share of the market is continuing to grow sharply. Index-based investments and so-called smart-beta approaches, implemented via exchange traded funds (ETFs), are progressively displacing active stock-picking and stock-weighting. In certain phases, the proliferation of ETFs could spawn higher volatility on equity markets and give rise to potential systemic risks.

▶ Demographics

In financial literature, a correlation between demographics and equity markets is postulated within the framework of the so-called asset-meltdown hypothesis. This hypothesis assumes that there is a negative correlation between the trend in the working-age population and equity-market risk premiums. The basic idea behind this theorem is that a large generational cohort ("baby boomers“) will invest a portion of their high aggregate income in shares and that such high demand for shares will push down risk premiums. When this generation retires from active working life and sells shares in order to finance their retirement, so the argument continues, an over-supply of shares and a corresponding increase in risk premiums (decrease in equity valuations) would be on the cards on account of lower demand for shares from the smaller generational cohorts which follow. In view of the demographic trend, this would suggest considerably lower equity yields in advanced economies in the years ahead whereas countervailing effects would be likely to materialise in threshold countries. However, the trend towards lower equity yields could be counteracted by greater international diversification of capital investments.

▶ Digitalisation

The megatrend of digitalisation is giving rise to new business models and putting conventional business models under severe pressure. In consequence, digitalisation plays an important role in determining how individual shares or sectoral indices perform. Those actors who benefit from digitilisation will be able to progressively boost their share in market-capitalisation-weighted equity indices. Digitalisation plays a role in equity trading too in the domains of high-frequency trading and algorithmic market strategies. One potential effect could be higher volatility on equity markets.

Corporate bonds: the credit market is already in the throes of change

▶ "Going passive"

The trend towards "going passive" is already apparent in the case of corporate bonds, but has primarily been a US phenomenon to date. The switch to passively managed strategies presupposes a certain market size, depth and transparency. The US market fulfils these preconditions best whereas other markets, due to liquidity constraints, do not look all that conducive to passive investments (high tracking error). This trend is therefore bumping up against its limits relatively quickly in the credit universe. The progressive shift towards passive investing (evident in the US market) is increasing retail-investor participation and (according to various studies) spread volatility.

▶ Low interest rates and high debt levels

The current environment of low - and, in some cases, negative - interest rates ought, in general, to provide solid support demand for spread products. Via the portfolio-rebalancing effect, investors are being progressively forced into lower rating categories. At the same time, volatility is on the increase because market participants are increasingly going for identical positioning (herding behaviour!). Companies, by contrast, are taking advantage of the low-interest-rate environment to (re)finance on favourable terms. Follow-up financing is easier to implement, and this could perhaps diminish the incentive to pay down debt. Given that low interest rates are a global phenomenon, issuers are endeavouring to realise interest-rate advantages, partly due to differing market structures, across all global regions. The European credit market is becoming more heterogeneous as a result (new structures, new issuers, etc.).

▶ Energy and climate change

By issuing green bonds, issuers raise funds for environmental and social projects, e.g. in the domains of renewable energies, energy efficiency and water-pollution control. Green-bond issues are, for the most part, launched by multilateral organisations such as the World Bank but companies too are increasingly entering the ring. Given that the topic of (environmental) sustainability is increasingly getting into the focus of investors, this form of financing could become more prominent (especially in the case of utilities and other energy providers) thanks to the megatrend involving energy and climate change.

▶ Political framework and regulation

Since the financial crisis, the pendulum has clearly been swinging back in the direction of regulation. This is affecting not only, but above all, the financial sector. The change is particularly conspicuous in the case of banks, which in the space of a single decade have had to comply with completely revised rules regarding regulatory capital, debt instruments and liquidity ratios, to mention only the three most important. The importance of Solvency II, not only for insurance companies themselves but also for financial markets on account of its impact on their investment behaviour, is less in focus but ought not to be underestimated.

Covered bonds: is there a risk of a speculative bubble?

▶ Low interest rates and regulation

Given the extremely ample availability of liquidity which is a function of the low-interest-rate environment, one of the central preconditions is in place for a speculative bubble, and this also applies to the covered bond market. It is true that the factors causing speculative bubbles on markets are far from having been definitively clarified. However, the combination of two factors could trigger herding behaviour among investors: the scarcity of investment opportunities arising from the flood of liquidity, and the identically formulated investment rules for banks (CRR) and insurance companies (Solvency II). This could create a situation in which the majority of investors were compelled to invest in identical assets, which could, in turn, help to further foster the emergence of a bubble in the covered bond market in the years ahead. In view of this, investors as well as decision-makers at banks, insurance companies and asset-management companies would be well-advised not to blindly follow the rules enjoined on them by regulation. What is rather needed is a differentiated analysis of the specific factors in each particular covered bond segment. In case of doubt, it would be better to exit a given segment (significantly) too early rather than too late.

▶ Energy and climate change

In September 2014 and April 2015, respectively, MünchenerHyp and Berlin Hyp placed the very first sustainable mortgage Pfandbriefe (also known internationally as ESG - Environment, Social, Governance - Pfandbriefe) in the capital market. In the case of such green Pfandbriefe, it is ensured that cover-pool composition is in line with ecological, social and politico-societal sustainability criteria. We are expecting other financial institutions to join this trend in the coming years. But the most important prerequisite for further growth would be a surge in demand from sustainability-oriented investors. Overall, there is reason to expect this segment to expand at a moderate rate. After all, Pfandbrief issuers can appeal to new investor groups in this way as the example of MünchenerHyp demonstrates: as many as one-third of the investors participating in this bank's green-bond debut had never invested in Pfandbriefe before.

Foreign exchange: low interest rates and energy prices are specially relevant

▶ Low interest rates

Interest-rate levels in the various currency areas are customarily among the most important factors determining exchange rates in forex markets. This state of affairs has not been altered fundamentally by the proliferation of low or negative interest rates but the latter are giving rise to undoubtedly novel phenomena. Currencies which used to only be rarely used as funding currencies for carry trades (borrowing in a low-interest-rate currency to invest in a currency offering a higher rate of return) are slipping into this role (the dollar some time ago and the euro at the moment). If there is a large volume of carry trades outstanding (this can be gauged from the volume of open short positions), such currencies behave, at times, like safe havens because carry trades are typically unwound and short positions covered in phases of risk aversion. What is more, exchange rates are no longer to be regarded predominantly as the outcome of interest-rate developments but are also at least a subordinate target for central banks which are out, for example, to raise inflation through the channel of currency depreciation. This presumably applies in particular when interest rates are in negative territory since such negative interest rates are often not passed on in full to domestic banks and households as they would prove an excessive burden or provoke evasive action (hoarding cash). Finally, the persistent low-interest-rate environment could lead in future recessions to exchange-rate trajectories different to those to which we are accustomed since low interest rates presumably influence the scope for action of central banks. In currency areas with comparatively high interest rates, central banks would be able, ceteris paribus, to react more strongly to downswings than their counterparts in currency areas where interest rates were low since negative interest rates and other unconventional (quantitative) measures probably entail more complex side-effects - and, to some extent, different effects - than conventional interest-rate cuts.

▶ Energy prices and high debt levels

Where low interest rates therefore look destined to play an important role for the currencies of advanced economies, the currencies of many emerging markets are very much in thrall to another important determinant, energy and commodity prices. The latter is not only a general determining factor for a large proportion of export revenues in commodity-abundant emerging markets; the commodity boom of recent years which has now turned to bust has also been associated with sharply rising public-debt levels in a number of countries. If future global economic growth proves to be less energy-intensive or is underpinned to a large extent by renewable energy sources, any rebound in energy prices could turn out to be rather slight. Heavily-indebted emerging markets reliant on commodity exports would presumably be hit particularly hard by such a scenario - and so would their currencies.

Real estate: exposed to almost all megatrends

▶ Low interest rates and high debt levels

The real-estate boom in Germany is being stoked by extremely low interest rates. Favourable lending conditions are enabling owner-occupiers to finance property which is already looking expensive. Also institutional investors are stepping up their activity in the real-estate market because the rental yield is still higher than the capital-market yield. Problems would crop up particularly in the event of an (unexpectedly sharp) upward shift in the interest-rate level. Above all in the case of private purchasers of real estate, follow-up financing on less favourable terms, constitutes a potential problem, when repayment rates had previously been low.

▶ Demographics

The fact that the size of the population is set to decline in the medium term in Germany and that society is "greying" will not necessarily lead to decreasing demand for residential space because residential space per head will increase at the same time. However, rising life expectancy coupled with people feeling younger for longer ("lower subjective age") will mean that ever fewer older people will give up their home and move into a nursing-care facility. This, in turn, means that older people's homes need to meet higher standards: greater importance will be attached to barrier-free living and to living centrally so as not to have to go far to shop or receive medical care. This, together with the fact that the population (including migrants) are progressively concentrated in urban agglomerations, is putting real-estate prices under pressure in regions where traffic connections are less good.

▶ Digitalisation

Even the search for real estate has been revolutionised and rendered more efficient by the large number of online portals which have sprung up. Over and above this, digitilisation is changing the real estate itself. For example, the quality of a region's internet connections is morphing into an ever more important criterion when it comes to real-estate valuation. By the same token, shared workspaces are increasingly gaining in importance in the case of office property at the expense of one-person or multi-person offices. Digitalisation is also entailing shifts in the attractiveness of different real-estate classes. By way of example, logistics is growing ever more important because higher demands are being placed on logistics chains in view of digitally-integrated just-in-time production at companies and a greater volume of online business. At the same time, retail property that is not in top-tier locations is losing in importance.

▶ Political framework and regulation

Changing political framework conditions can likewise have major effects on the real-estate market. Tax incentives and building regulations have a rather immediate impact on construction activity. What is more, the public sector intervenes directly in the real-estate market (for example by building subsidised council houses and launching infrastructure projects). But ex post rulings depressing the yield of investors are also having in some cases, palpable effects (e.g. Germany's new rental-price brake; or the new principle that whoever appoints the lettings agent has to pay his commission, effectively preventing landlords from passing on the costs to future tenants; or energetic standards).

▶ Energy

Energy efficiency is a major topic with regard to real-estate construction. Renewable energy sources (solar, pellets, etc.) are already being widely used. What is more, many political framework conditions come into play here. For instance, the need to comply with energetic standards adds to construction costs, whereas promotional loans linked to (improving) a building's energy balance boost the incentive to upgrade the energy performance of real estate and to construct properties in an energy-efficient manner.

Commodities: energy policy and political framework are the main drivers

▶ Energy and climate policy change

The most important megatrend from the point of the commodity markets is, without doubt, the furious pace of change in global energy and climate policy. A case in point here is the Chinese government's increasing efforts to support electromobility through direct regulations as well as subsidies. This could bring a distinct reduction in global demand for conventional combustion-driven vehicles, which would have considerable knock-on effects on demand for - and therefore on the price of - crude oil. The aspired-to paradigm shift away from fossil fuels is aimed at reducing output, and thus supply, in a sustainable manner in the longer term. At the same time, the boost to energy efficiency which is being aspired to is supposed to have a dampening effect on demand. However, countervailing effects are going to be dominant in both areas in the short term. This is because there is a substantial incentive for suppliers to ramp up supply in the short term if they are expecting lower demand and more restrictive politial regulation at a later date. The concomitant decline in prices will, in turn, spur consumption. The impact of energy and climate policy on commodity prices is therefore subject to a time-lag and may also change significantly at short notice. It is true that most observers ascribe the sharp drop in commodity prices witnessed since mid-2014 to temporary developments; on the other hand, this can be interpreted as a sign that the "paradoxical effects" of energy and climate policy descibed above are already playing a role today.

▶ Political framework and regulation

The shift in global geopolitical conditions likewise has a central bearing on the way commodity markets, and commodity prices, shape up. Especially during conflicts between states, commodities and commodity prices are increasingly being mobilised as political capital. Recent examples are the sanctions imposed by the West on Russia (and vice versa), the quarrel over gas between Russia and Ukraine, and the EU and US sanctions against Iran which have now been scaled back significantly. In the political decision-making field, however, the impact on price developments is frequently less unambiguous than would be expected at first glance. For example, the escalation in the political and religious conflicts in the Middle East and especially in important oil-producing countries (Iraq, Libya) has not – contrary to expectations – led to a reduction in supply, or to speculation about such a reduction, nor to a substantial run-up in the price of oil. The parties involved have rather being using oil exports as a strategic source of income to finance their political goals, expanding them to a noticeable extent in some cases. At any rate, the shifts in the balance of power in the Middle East, and on a global level, which are likely to emerge and the faster pace of such developments are probably going to have a considerable influence on commodity prices and will drive volatility in individual market segments. Regulation can also exercise a most perceptible influence on the price of certain commodities by influencing demand. The focus here is on the regulation of commodity-futures markets. In particular, we are hearing calls from many quarters to exclude institutional and speculative investors from commodity business. On the other hand, it is disputed whether speculative demand does indeed increase volatility and decouple commodity prices from the fundamentals. To that extent, the consequences of heavier regulation and greater constraints for these market segments on price trends remain unclear.

▶ Digitalisation

Digitalisation too has repercussions for the commodity markets. The more pronounced sectoral shift in value added from industrial production to services which is associated with this has implications for many types of commodity. In this context, the increased use of mobile devices is accelerating demand for precious metals such as copper and zinc and for rare earth elements at the expense of conventional metallic commodities.

Government bonds: direct effect on issuers and a shift in investor behaviour

▶ Low interest rates and high debt levels

In this environment, strategies to generate an additional yield (e.g. on the repo or volatility market) are more important than when interest rates are at an adequate level. Second-line and third-line SSA issuers whose debt instruments still offer a yield pick-up over government bonds gain in importance in a zero-interest-rate environment. The rise in the propensity to save has led to a fall in the natural interest rate. The question is whether today's low interest rates will lead, further down the road, to a reversal in this trend, which would see the propensity to save declining again. Scenarios involving sudden spikes in interest rates should be factored into risk models to account for situations in which the interest-rate picture shifts unexpectedly quickly (cf. last year's "bund tantrum“) or in which debt sustainability is called into question in an environment of low growth and inflation rates.

▶ "Going passive"

Passively managed investment products have already been on the advance in the equity field over the past few years and they are now gaining noticeably importance in the bond domain as well. This trend is going to be further reinforced by the zero-interest-rate environment and the pressure on margins resulting from this development. Such pressure is greatest for clients seeking to invest in government bonds because interest rates are no longer sufficient in this segment to cover the administrative costs of active asset managers. In addition, this development has aggravated herding behaviour on the bond market, which may lead to downward spirals, especially in negative market phases. This, together with the ECB's bond purchases, is reducing market liquidity in the government-bond segment – a state of affairs which could spawn abrupt market gyrations.

▶ Demographics

Demographic change is having manifold effects on saving behaviour. Rising life expectancy and dwindling ("pay-as-you-go") state benefits are heightening the importance of private precautionary saving for old age. At the same time, more and more baby boomers in industrialised nations are retiring and – according to the portfolio theory – can be expected to switch increasingly from risky to lower-risk asset classes. A higher private savings rate and shifts towards fixed income imply a declining yield. But the demographic development may possibly also impact the public sector by saddling it with higher obligations (e.g. pension and health-care systems). Higher public debt combined with a lower potential growth rate would cause the creditworthiness of issuers to deteriorate while refinancing requirements would be rising at the same time. Doubts about debt sustainability would imply higher risk premiums, which would mean a higher yield level. Hence, both effects are ambivalent.

▶ Digitalisation

For digitalisation to function, a special infrastructure is needed which could be provided by state institutions in certain sub-domains if investment in those fields did not appear to make financial sense to the private sector (e.g. broadband expansion in rural areas). The costs involved could be absorbed through higher debt levels for overall government budgets or else through special promotional programmes (development banks). Development banks could see parts of their business model erode if private-sector and public-sector borrowers were able to solicit capital directly via platforms (crowdfunding). In future, bond issues could be placed with investors without banks, which have, up to now, played a role as intermediaries, being involved ("e-syndicate platform“).

▶ Energy and climate change

Public-sector issuers often treat the topic of energy and climate change under the rubric of the debate on sustainability. In March, the German state of North-Rhine Westpfalia issued its second sustainability bond. The KfW and the EIB already set up green-bond programmes and promotional programmes fostering sustainability and energy efficiency quite some time ago. Further issuers are likely to join the trend towards refinancing through green bonds and sustainability bonds in the SSA segment.

Sector allocation: digitalisation and the need to secure a sustainable energy supply are causing business models to be called into question in many sectors

- Above all two megatrends are causing business models to be adjusted

Digitalisation and developments connected with the energy supply are topics which will preoccupy industrial sectors in Germany and all over the world in the coming years. The imperative for companies in this context is to position themselves in good time so as to secure the place they covet in the value-added chain of the future. All this involves heavy investment in conjunction with a high degree of uncertainty about market trends and is causing many traditional business models to be looked at critically.

- Energy and climate change

A secure and favourably-priced energy supply is of central importance to virtually all industrial companies. On the other hand, conventional energy sources such as oil, coal or gas involve pollutant emissions harmful to the environment. Winning energy from ecologically correct resources is therefore becoming more and more of a centre-point of political action right round the world. Different countries are adopting different approaches here, though, and it is not yet possible to foresee which type of energy generation, or which combination of types, will come out on top in the long term. For example, the future path has been mapped out in Germany by the "Energiewende " and the nuclear phase-out associated with this. On the one hand, this has sharply increased the costs incurred by energy-intensive sectors relative to the situation internationally. On the other hand, German corporations have managed to carve out globally leading positions for themselves in many segments involving environmentally-compatible technologies. The "Energiewende" is therefore a risk and an opportunity at the same time for sectors of German industry.

- Digitalisation

A comparison of individual economic sectors makes it clear that the process of digitalisation is taking very different forms at a sectoral level and is taking place at different speeds and in different degrees. What is common to all sectors, however, is that the consequences of digitalisation - even though they may scarcely be perceivable in the short term - will far outstrip the usual degree of technological progress in the long term. Traditional value-added chains will be altered and new sectoral structures will evolve. This process can even involve disruptive innovations which make entire business models superfluous. The message to companies is to gird their loins for such challenges.

Country allocation: the process of demographic change has the potential to engender landslide shifts in the political and economic balance of power

▶ Demographic change

The topic which is currently predominant with regard to the economic prospects of virtually all countries is undoubtedly demographic change, especially the sub-category of migration. Where an enormous amount of political capital is being made in the US presidential-election campaign out of the idea of building a wall to prevent immigration from Latin America, politicians and the media in Europe are being kept in suspense by the Syria conflict and the resulting refugee crisis. Russia and Turkey are other prominent protagonists involved in this predicament. In parts of India and Africa, on the other hand, population growth is impeding economic emergence or is adding fuel to the fire of regional conflicts. And an end to the tectonic shifts of demographics and to their repercussions on the economic, fiscal and political development in a multitude of countries is not foreseeable.

▶ Energy and climate change

Along with the financial industry, the energy industry is regarded as a neuralgic sector with respect to the economic development of many states and their industrial sectors. One need only think here of such innovations as fracking, which has allowed the USA to reinvent itself as the world's largest oil producer over the past few years. It is true that the recent slump in global crude-oil prices has translated into noticeable purchasing-power gains for oil importers. The other sides of this coin, however, are the phenomena of recession and currency depreciation which have descended like forces of nature on oil-producing emerging markets. Going forward, a strong position in the renewable-energies sphere is probably going to be a decisive advantage if countries are to create prosperity for their citizens.

▶ Political framework and regulation

International politics plays a role especially in narrowly circumscribed sub-areas such as the institutional progression (or regression) of the EU or the creation of free-trade zones. Regulatory provisions can also have massive knock-on effects - one only need think of the creditworthiness of the financial system in a given country. However, it is to be expected that political systems will manage to avert excessive damage.

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