

EXPECTED RETURNS

2017

IT'S ALWAYS DARKEST JUST BEFORE DAWN

2021



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Executive summary

As was the case in 2015, so far in 2016 too we have been subject to a number of negative surprises. The US economy has been hit by falling oil prices, Europe is still reeling from the UK Brexit result and Chinese growth prospects look uncertain. The Federal Reserve has carried out a solitary rate hike, but the central banks in the UK and Japan still seem to be light years away from this. The monetary normalization we expected has not materialized. No wonder sentiment seems to have hit rock bottom. And then there are other challenges too: the debt cycle, global warming and the failure of certain emerging markets to really 'emerge'.

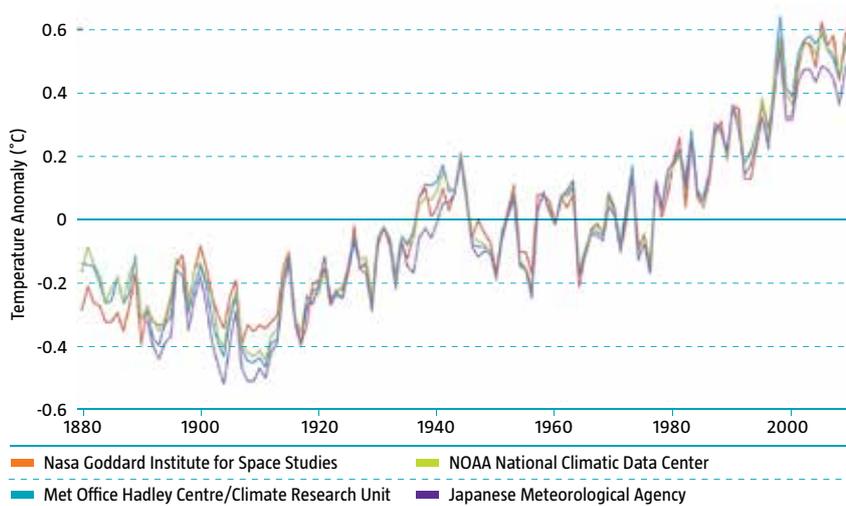
In December 2015, when we first set out to discuss the possible content of this year’s edition of our Expected Returns publication, we were in good spirits. The European economy had surprised everybody by growing above trend and the Fed’s first interest-rate hike had not derailed markets as many had feared. The world economy was also picking up, reaching escape velocity – ready to propel itself out of a scenario of disappointing and low growth rates. The Fed was expected to be just the first of the central banks to start the process of monetary normalization, with the Bank of England set to follow its example.

Sure, there were issues; there always are. The price of oil for example. It had been declining for over a year, with no end in sight. Positive for consumers, perhaps, but the financial markets focused more on what the consequences would be for markets like US high yield. Spreads widened, investors started to withdraw funds, leading to temporary liquidity concerns. It also raised the question of whether this was a one-off event, resulting from developments in the US shale sector, or were there more structural issues at play? Numerous economists were telling us that debt levels had been increasing for years, and that this was bound to lead to an adverse debt cycle before long. But were they right?

And what about the meltdown in emerging markets? The BRICs, remember those? The BR part was not doing too well. The Brazilian economy contracted by 3.8% in 2015, and in Russia this figure was 3.7%. Admittedly, the ICs, India and China had done better, much better, but at what cost? How long could China continue on its current path? Emerging market equity investors had little to show for the risks they had taken on board, which raised the question of what to do with these assets. Sell? Or was this the ultimate buying opportunity, with valuations at the most attractive discount seen in decades?

Then there was the winter. Or rather, the absence of one. Records were broken across the globe, with December 2015 registering the warmest average temperatures ever. The ‘most powerful El Niño on record’ was a major contributor, but with global temperatures reaching new highs on almost an annual basis, it was clear that this was not just a one-off event. Admittedly, this is not necessarily a topic that haunts the financial markets, but that does not mean we should simply ignore it. Can we take a subject like global warming into account in formulating a five-year outlook and if so, are there relevant observations to be made in terms of investment policy?

Figure 1.1: Global average temperature anomaly (1850-2015)



Source: NASA Goddard Institute for Space Studies

Debt, emerging markets and global warming: serious topics. And as I said, our spirits were high and the future looked bright, so we were willing to tackle them...

Eight months on and we have to admit that our spirits are not in such good shape. The hoped for normalization has turned out to be nothing more than that single rate hike by the Fed. The US economy has been hit by the significant decline in oil prices. This put an end to the positive investment impetus in the more dynamic part of the US economy (shale), raising uncertainty for the growth outlook for the economy as a whole. There were also various external factors that kept the Fed from hiking rates: uncertainty surrounding the Chinese economy, volatility in the financial markets and – one big negative surprise – the outcome of the Brexit vote. The latter shattered any hopes that UK monetary policy would move towards normalization. In fact, the prospect of a UK recession triggered the Bank of England to follow the path taken by the ECB and the Bank of Japan earlier in 2016: more quantitative easing. Unless we now regard QE as the new normal, it is clear that 2016 is not set to become the year of monetary normalization.

Is this just another temporary setback, or is it time to acknowledge that Robert Gordon was right when he stated that growth would remain subdued from now on? It has been four years since he published his ideas, and so far the low growth statistics are supporting his arguments. What's worse is that you can't help feeling that it has never been easier to come up with credible doom scenarios. These range from a further disintegration of the European economy (Brexit, the rise of populist parties, Italian banks), a Chinese hard landing (unsuccessful rebalancing of the Chinese economy, high debt), a rise in protectionism (the Trump factor), the loss of central-bank credibility (Japan) and the bursting of the debt bubble.

It's always darkest just before dawn...

So, is it really all that bad? From discussions with clients and the feedback from presentations at investor forums over the past six months, we would be inclined to think that the answer is yes. Although we can't prove it, our impression is that the general sentiment among professional investors has never been as weak as it is right now. In a poll held earlier this year, more than 50% of the 200 professional investors questioned said they expected bond yields to remain low for 'decades to come', while more than 12% opted for the answer 'we haven't seen anything yet'. If you look at what the financial markets have priced in the message is similar: inflation expectations in the European market (5 year/5 year forward) reached a new historical low of just 1.25% earlier this year. To clarify: this means that the market was expecting average inflation for the period 2021-2026 to be as low as 1.25%. Looking at the West-German track record (renowned worldwide for its tough inflationary stance), such a five-year average is pretty rare: an investor would have lost money on this trade 90% of the time. And this percentage rises to 95%, if we exclude the first ten years after World War II. Possible? Sure. But is it likely? Well, only if you really are very pessimistic about the future. Which is exactly the point we are trying to make.

On the one hand, this pessimism is a risk in itself. There is plenty of self-reinforcing momentum embedded in the way economies work, which means that a move in one direction is not easily reversed. Once growth weakens, producers and consumers become more cautious, and investment, employment and consumption levels all contract, reinforcing the downward trend. On the other hand, one can argue that this is the best medicine out there: once expectations are this poor, the threshold for surprises on the upside is very low. Stock markets normally hit bottom when things are at their bleakest. If earnings evaporate, companies collapse, people get fired in their thousands and there is talk of 'the end of capitalism as we know it', that's the time when the market turns. The bad news continues

to dominate for months, but stocks move higher, as the market is already discounting it. The bleaker the expectations, the better the odds that the surprise will be a positive one.

It's always darkest just before dawn. And if the mood of investors is anything to go by, it is already pretty dark out there.

Special topics: debt, emerging markets and global warming

Which brings us to our special topics. Debt, emerging markets and global warming. These are all very relevant topics for longer-term investors, but couldn't we have picked less depressing subjects? Where is the upside in global warming? What is the 'positive angle' when it comes to the ever-increasing debt pile? Not that we want to shy away from bad news or weighty subjects, but isn't this overdoing it?

So is there upside in emerging markets? In our opinion the current discounted levels at which emerging market equities are trading compared to developed markets are warranted based on the expected weakening of the Chinese economy. Stocks are cheap for a reason – but we do see upside potential for earnings. On balance, we are more constructive on emerging market bonds, as EM currencies are trading at a discount on a purchasing power parity (PPP) based valuation metric.

And is there a positive angle when it comes to debt? We can think of several, but the most obvious one is the fact that debt is wealth. One person's debt is another person's asset. Instead of talking debt supercycle, we could also be talking wealth supercycle, but somehow nobody ever does... Isn't debt just a logical consequence of the increased level of wealth and the high level of savings? Is it possible to see a massive increase in wealth, without this triggering higher debt levels somewhere? That is not to say that we are not concerned about the higher debt levels in certain markets (China, government debt), but we think that the whole 'debt is bad' premise is an oversimplification.

Finally, where is the upside in global warming? For sure, this is where the biggest challenges lie, and much will depend on the actions taken by the various parties involved. One reason for optimism is the fact that global concerns about the phenomenon have increased markedly resulting in the recent ambitious Paris Agreement. Having said that, based on the knowledge we now have, all scenarios will require adjustment costs, with risky assets and emerging markets likely to be negatively impacted.

Baseline scenario

Apart from these special topics, we have of course also taken a fresh look at the up- and downside for the world economy and the various asset classes for the next five years. As always, we present three scenarios, to cater both for the divergent ways our clients look at the world and to show the sensitivity of our return estimates. So what has changed? Faced with yet another disappointing year and the growing list of potential risks outlined earlier, it is tempting to succumb to the general feeling of pessimism. Tempting, but we continue to believe that a gradual normalization is the most likely outcome. Call us optimists if you like. But one fact overlooked by many is that – despite low growth – labor markets have strengthened, with unemployment rates in all of the leading economies currently below their longer-term averages. In this scenario, consumers whose disposable income has been boosted by the drop in oil prices are expected to play a central role, as the balance sheets of the household sector have generally improved.

Mind you, looking at the underlying growth and inflation assumptions, we would like to emphasize that we are not predicting anything out of ordinary: the world economy, including

the emerging markets, will grow by roughly 3%, inflation will reach an average of 2.5% for the world as a whole and 2% for the developed countries. This growth rate is lower than what we predicted in our baseline scenario last year. Neither are we blind to the risks evident in the current environment. To reflect this, we have lowered the likelihood we attach to our baseline scenario, from 70% to 60%. The odds of an adverse stagnation scenario developing have increased, so we have now put this at 30%.

Table 1.1: Five-year annual return expectations major asset classes

	Current edition 2017-2021	Previous edition 2016-2020	Steady state
High-quality government bonds*	-3.5%	-3%	4.25%
Cash or money markets**	0.75%	1.5%	3.25%
Investment grade credit bonds***	-1.25%	-1.75%	5.25%
High yield bonds***	1%	0.5%	6.25%
Equities developed markets***	6.5%	5.5%	7%

* Based on the German 10-year bond ** European *** Worldwide. Source: Robeco

Looking at the implications for the broader asset classes, we end up with the table above. Much like last year, we are not particularly positive on government bond returns. We have even lowered our five-year expected return on AAA European government bonds to -3.5%. Yields have dropped to even lower levels than last year, which means that the buffer against adverse price moves has shrunk still further, and is in fact negative for AAA European government bonds. Much in line with what we said last year, this does not mean that we see no role for bonds. Within an asset liability management (ALM) and risk framework there will always be a place for bonds. We should also point out that the -3.5% is based on the German ten-year benchmark, which has almost the lowest yield out there. According to our projections for the US for example, we end up with a -0.25% negative return (local currency), while peripheral European bonds also offer better value. Additionally, value can be added if an active investment policy is applied for this asset class. With respect to equities we have increased our five-year target by 1%, reflecting the decrease seen in the overall valuation of equities worldwide. At the same time, we have taken a critical look at the longer-term steady state outlook for equities, which we have lowered to 7%. On the one hand, this is a reflection of a somewhat reduced growth outlook – linked to lower productivity growth – but also to an update of expected dividend income.

Alternative scenarios

As for the alternative scenarios, we have become more cautious. This is reflected in the upward revision of the likelihood of our stagnation scenario (from 20% to 30%). There are many forms that this scenario can take, but we prefer not to be too specific. In general, we expect the growth of the world economy to decline to 1.6%, half the level we have seen over the past five years. Some areas will be hit by recession, China will hit zero growth, from which a subdued recovery will take place. Inflation will drop to an average of 1%, but would reach deflationary average levels without the contribution of emerging markets: the Western world will sink into a Japan-like scenario, with aggregate price levels remaining unchanged for prolonged periods. Unlike the baseline scenario, in this adverse growth scenario bonds remain the place to be, offering the only value for money.

Table 1.2: Returns in three scenarios

	Baseline	Stagnation	High growth
Average growth*	2.75%	1.5%	3.5%
Average inflation**	1.5%	0.25%	2.25%
High-quality government bonds***	-3.5%	2%	-4.75%
Cash or money markets**	0.75%	-0.5%	2.25%
Equities developed markets	6.5%	-2%	6%

* Worldwide ** European *** Based on German 10-year bond. Source: Robeco

In our optimistic high-growth scenario, which remains at a 10% probability, the US and the Eurozone economies expand rapidly, initially boosted by consumption, but eventually strengthened by investments as well. The world economy enters a virtuous circle. Debt ratios come down. The Chinese economy succeeds in transforming itself. In the slipstream of the strong economies, growth in Japan accelerates too. On average, the global economy's real growth will reach 3.5%. This may not sound like high growth if we compare it to the average 3.25% seen over the past five years, but if we take aging and the lower (and more realistic) growth rate of the Chinese economy into account (average growth of 6% compared to 8.5% in 2010-2015), it means that growth will actually rise above its underlying potential. The main risk in this scenario comes in the form of inflation. Bonds suffer and even stocks post somewhat less positive performances compared to our main scenario, as wage and financing costs hurt margins.

We have ended with our least likely scenario, but remember it's always darkest just before dawn... We hope you will enjoy reading this publication and that you may find it inspiring and helpful in setting your course for the years to come.



Lukas Daalder, Chief Investment Officer Investment Solutions
September 2016

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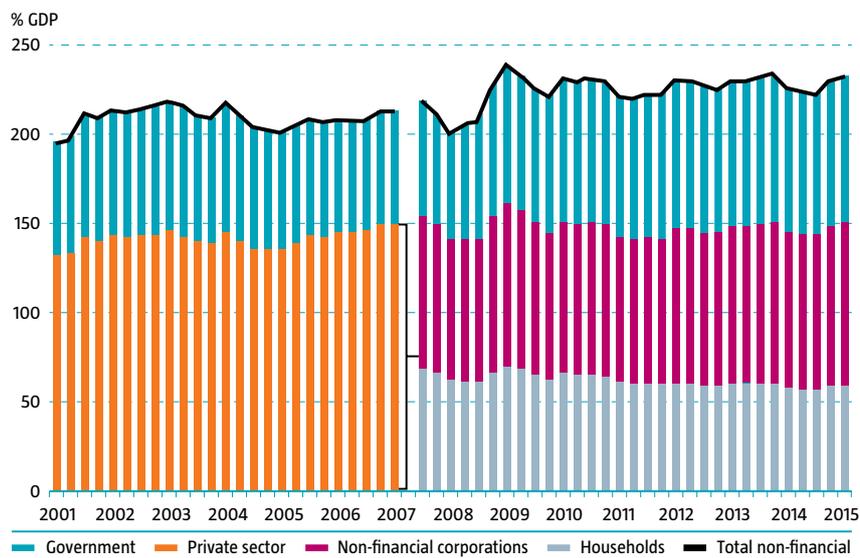
The debt supercycle

Before you google the word 'debt', prepare yourself to become depressed at the results you will find. Apart from the negative images (manlike figures bound in chains, or buckling under the weight of debt) and gloomy quotes ("A man in debt is so far a slave", or "Debt is the worst poverty"), you will find a slew of reports and charts showing the alarming rise of debt in the world. Whether it is governments, China or US companies, you do not have to look hard to find charts that show that debt has been on a one-way trip. The worrying trend here seems to be that no matter what the underlying economy is doing, debt levels seem to have moved higher. As a result, many characterize the current debt situation as a debt supercycle, which raises questions on what the ramifications of this significant debt buildup will be. So, how bad is the situation, and will debt come back to haunt us over the next five years?

Debt gets a bad rap

To start with the first obvious question: is the debt situation really getting out of control? Surprisingly, although it is easy to find alarming reports and charts on the 'debt explosion' in specific sectors and countries around the world, it is much more difficult to be alarmed by the trend when taken on an aggregate, global level. The aggregate of total worldwide debt at governments, households and non-financial corporations (so excluding financial institutions) has risen at an annual growth rate of 4.2% since 2008, which is only slightly in excess of the nominal growth rate of the world economy. Measured as a percentage of GDP, total debt held by this group has increased from around 220% in 2008 to 230% in 2015. It is an increase, but the 10%-point rise is not exactly shocking. What's more, almost all of it is attributable to the increase in government debt: on aggregate, household and corporate debt as a percentage of GDP has been more or less stable around a level of 150% of GDP since 2003. These debt levels may appear to be too high, but the idea of an impending debt explosion across the board appears to be misleading.

Figure 1: Private debt has been more or less stable since 2003



Source: IMF, Robeco

So, if the aggregate debt situation is not about to explode, does that mean that the whole debt concern is overblown? There are indeed a number of arguments to suggest that debt is represented as a pretty one-sided phenomenon.

- On a general note, it should be pointed out that there is nothing inherently wrong with debt. To quote the Economist: 'Debt is a highly useful tool. It allows people to invest for the future, be it in business ideas, housing or big ticket items like cars. Debt, if used wisely, can transform the prospects of individuals, businesses and even economies at large. Of course, the question is where the limits of 'using wisely' exactly lie'.
- Where there is a debtor, there is also a creditor. In other words, one person's debt is another person's asset. Mortgage debt is an asset for banks, government bonds are held by pension funds, debt issued by corporates is financed by investors and banks. Bearing this in mind, the whole increase in debt can also be seen as a pretty impressive increase in wealth. Instead of talking debt supercycle, we could also be talking wealth supercycle, but somehow nobody ever does...

'The idea of an impending debt explosion appears to be misleading'

Although this does not change anything in the underlying trend or the possible related risks, it does, interestingly, shed a different light on the issue. Isn't debt just the logical consequence of the increased level of wealth and the high level of (retirement) savings? Would it have been possible to see a massive rise in wealth, without it having triggered a rise in debt somewhere? This also raises the question of the extent to which debt reduction can be implemented without it having major (and negative) consequences for the wealth part of the equation: can we solve the debt problem, without destroying the wealth benefits?

- Not all debt is equal. There is a big difference between debt that is mainly aimed at boosting (short-term) consumption and debt linked to investments that can lead to future returns. Additionally, a fair share of private debt is linked to an underlying asset, which means that looking at debt on a standalone basis is only half the story. The fact that debt has risen does not necessarily reflect a deterioration in the credit quality of individuals or companies. Rather than looking at the gross debt figure, an assessment of the net numbers adds additional valuable information.¹
- Not all countries are the same. The significant increase in debt in certain emerging markets is at least partly a reflection of the fact that their equity markets are not yet mature: debt is the logical, if not the only way to finance investment plans. The fact that it can be converted into equity at some point in the years to come, also reduces the threat of debt accumulation.

1. The Netherlands is a typical example of a country at the top of the list of the most indebted countries in the world, with household debt above 250% of GDP (OECD figures). These numbers do not take into account the big pension assets in excess of 160% of GDP held by the pension funds, or fiscally driven assets held in asset pools directly tied to debt.

Debt, as it turns out, is not as black and white as it is sometimes made out to be.

Make no mistake: high debt is bad though

Having made these points, we would like to stress that we are not saying that debt is not a threat: you need only look at the extensive and long history of past debt-default cycles to know that there are enough reasons to be cautious about a rapid and sustained rise in debt.² Although debt can be seen as a net zero for the economy as a whole (debt = wealth), there are reasons why too high a level of debt leads to trouble in the end:

- Although research is divided on the exact level at which the difficulties begin, there is a limit to the amount of productive investment an economy can generate at a given time.³ Pushing debt beyond that point, means that it is no longer used productively and that debt repayment will become problematic at some point.
- Although we stated above that net debt can be a more informative figure in assessing the overall debt situation, there is also a clear risk involved when more debt leads to inflated prices (in real estate, for example). As we have seen in the recent past, real estate booms can last for quite some time, but can have a very nasty effect if prices take a turn for the worst: the value of the underlying asset declines, the debt does not. The fact that debt is permanent and stable and the underlying asset is not, creates problems.
- Debts need a financial industry to administer them. The higher the level of debt, the bigger this financial sector will be, reducing the resources available for the rest of the economy. Although this may sound like a theoretical and second-order effect, the fact that a fair share of the 'brain power' in various countries has been employed by the financial sector, shows that the effect can be more than just theoretical.
- A rise in debt can be a sensible thing if a country is in a rapid expansion phase, as nominal growth will reduce the future debt burden. As such, high debt in a rapidly expanding emerging economy is far more manageable than it is in a developed, aging economy. But it is clear that at least part of the debt buildup seen in the last decade has taken place in this last group of countries.

2. See for example Schularick and Taylor (2009).

3. See Reinhart and Rogoff (2009) and Cecchetti and Zampolli (2011).

- The numbers presented in Figure 1 are numbers that exclude the financial sector. The deleveraging of US household debt has at least partly been achieved by ‘handing in the keys and walking away’, or in other words, transferring the debt problem to the financial sector. But as a result, the reduction of debt in the US private sector is probably too positive a representation to be applied to the US economy as a whole.

A final point to explain why the trend evident in various market segments could be a threat after all, is the fact that debt cycles tend to spill over into other segments or countries. This has been true, for example, for emerging markets in the past (the collapse of Thailand triggering the Asian crisis), but was clearly also the case with the subprime crisis in the US. One default can trigger a liquidity dry-up in other markets, effectively giving ostensibly solvent parties payment troubles.

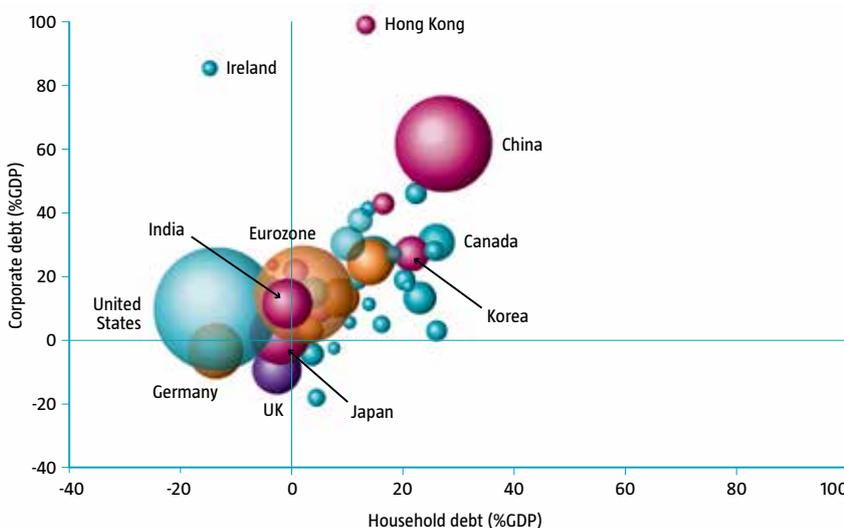
So now what?

So, is the debt supercycle likely to come back to haunt us over the next five years? For this to happen, it looks as if three requirements will need to be met: debt will need to reach a critical level, the economy (or cluster of economies, like emerging markets) in question will need to be big enough to have an impact, and investors around the world will have to have sufficient exposure to the troubled debt in question. Based on these criteria we can identify the biggest risk areas when it comes to debt. We first turn our attention to the private sector, so excluding governments and financials.

In Figure 2 we have plotted the change in debt as a percentage of underlying GDP over the past ten years for the major economies in the world. The horizontal axis shows the change in household debt, the vertical axis the change in corporate debt, while the size of the bubble shows the relative size of the various economies. Whereas Figure 1 shows that overall private sector debt has remained stable at an aggregate level, Figure 2 shows that this has been the result of various different underlying trends. Most countries can be found in the northeast quadrant, with both household and corporate debt rising. The fact that the aggregate debt growth has been more or less neutral nevertheless, is because a number of major economies (the US, Germany, UK) have been deleveraging or keeping their debt levels stable (Japan, India).

‘Deleveraging of US household debt has partly been achieved by handing in the keys and walking away’

Figure 2: Debt has been stable on aggregate, but underlying changes have been substantial



Source: BIS, Robeco

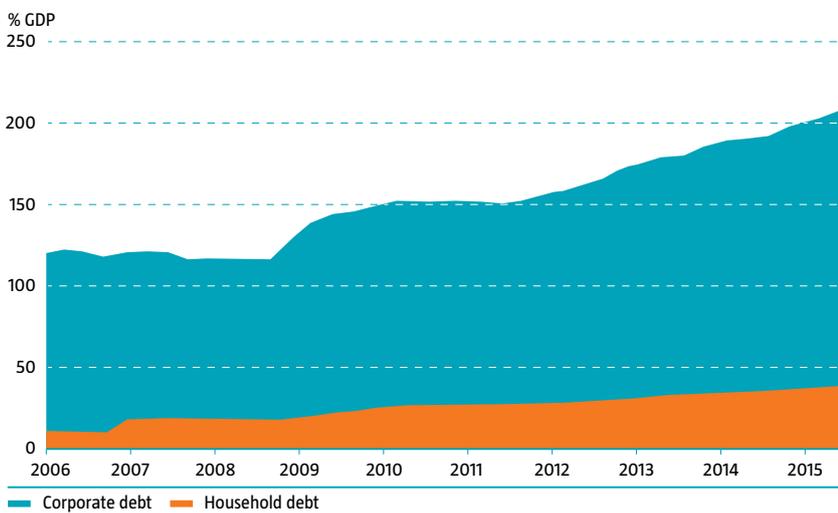
China is the exception

The one obvious exception to this 'big-is-stable' theory is China, with the strong rise reported in private debt there. According to data from the Bank of International Settlements (BIS) private debt had risen from below 120% in 2008 to 205% by 2015, mostly driven by a near stellar increase in corporate debt.⁴ Although not unheard of, a level of private debt in excess of 200% of GDP is high by international standards, and in fact has almost never before been reached by a lower/middle income country in peacetime.

It is easy to find negative examples of what could happen next. Japan reached the 200% mark in around 1989 and is still trying to recover. Spain's private debt reached the same level as where China currently is at the moment when the Eurozone crisis erupted. Both the US (subprime) and Thailand (starting point of the Asian crisis) ran into trouble with a private debt of 'only' 170% of GDP. Although indicative of what may be in store, these examples also have a clear drawback: they do not offer an exact debt level at which things start to go wrong. As indicated before there may be a limit to the amount of productive investments an economy can generate, but this level could be a lot higher in a developing economy such as China. The fact that there has been no emerging economy with a similar private debt burden before may be a reflection of an underdeveloped financial system: perhaps China as a centralized managed economy with a very high savings rate has a much more advanced banking system, enabling it to tap into bigger growth potential. Additionally, with a current nominal growth rate of 8%, it will only take ten years to half the debt to GDP ratio, if the debt level is kept stable. Any debt problem is more manageable if combined with high growth rates.

4. It should be noted that the BIS numbers qualify Local Government Financing Vehicles as non-financial corporations. Roughly 25% of corporate debt could also be classified as (local) government debt.

Figure 3: Extremely strong increase in Chinese debt



Source: BIS, Robeco

This last point introduces a chicken and egg problem: hasn't growth been boosted by the high run-up in debt seen in recent years? If so, it increases the risk of the virtuous cycle becoming vicious: high debt puts a drag on growth, and with lower nominal growth rates, the debt problem becomes less easy to solve. There are indeed a growing number of signals to indicate that debt has exceeded the non-productive level. Official non-performing loans have steadily deteriorated in recent years, while a recent analysis by the IMF put the potential losses linked to corporate debt at 6.9% of GDP.⁵

5 In the latest IMF Stability Report, the fund has calculated that USD 1.3 trillion (15.5% of total corporate loans) is at risk, which could represent a potential net loss of USD 756 billion.

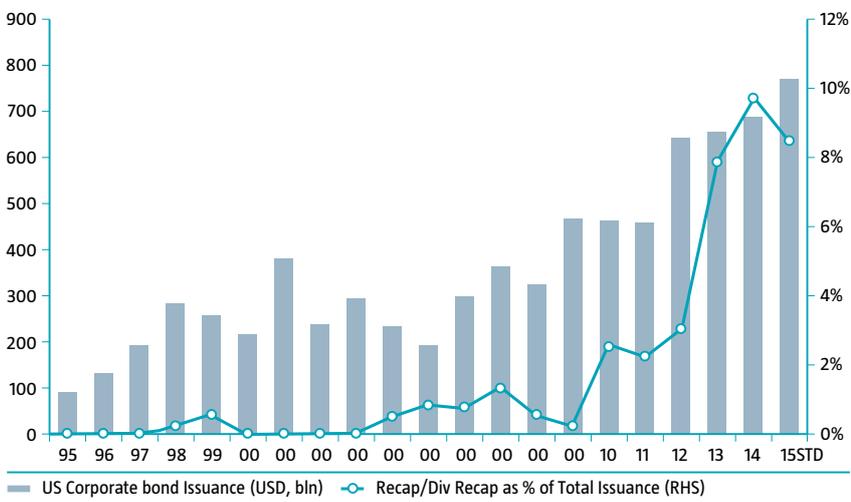
So, we have a sizeable economy (the second largest in the world), which has accumulated a high level of debt and there are some tell-tale signs that the boom is over: will this become the next financial crisis with ramifications for financial markets across the world? Although there are always potential scenarios that end in chaos, it is not the most likely outcome. Unlike the US subprime crisis, where the underlying risks extended worldwide, Chinese debt is mostly in domestic hands and rising bankruptcies will not create havoc in the Western banking sector. Added to this is the fact that China is still a centrally managed economy and the main problem seems to lie with the state-owned enterprises so a coordinated approach is possible. Unlike, for example, US subprime, much of the debt problem seems to be concentrated at an institution with deep pockets. Although this will have an impact on underlying growth, which will become a dominant theme in the financial markets at times, it is difficult to see how it would develop into a crisis similar to the 2008-2009 subprime crisis. In that sense, it looks as if what could happen in China would be much more like a Japan-in-the-early-nineties event: certainly painful, but unlikely to trigger lasting corrections in the financial markets outside the country itself. But it all depends on the policy measures taken by the Chinese authorities, which means that it will be crucial for them to abolish their current overly ambitious growth targets and let bankruptcies happen. The further the can is kicked down the road, the more likely an adverse medium-term scenario becomes.

‘Although some potential scenarios end in chaos, it is not the most likely outcome’

US corporate debt

The second potential threat is posed by the US. It is the biggest economy in the world and – unlike China – its debt is spread around the globe: a debt default cycle could certainly have adverse consequences for the broader financial markets. What’s more, it is easy to find some alarming numbers when it comes to rising bond issuance and bank debt. According to data from the Securities Industry and Financial Markets Association (SIFMA), annual bond issuance had doubled to USD 1.5 trillion between 2008 and 2015, while data from Deutsche Bank shows that the market for high yield bonds and bank loans has increased by 65% over the past five years. Easy credit conditions (even for entities with low credit ratings) have induced companies to tap the market for cheap capital. The worrying part seems to be that this debt issuance has gone hand in hand with a steady erosion in underlying credit quality, while defaults have clearly picked up over the past 12 months. This is also reflected in the increase in debt linked to dividend financing and share buybacks: there is

Figure 4: Bond issuance is linked to dividends and buybacks



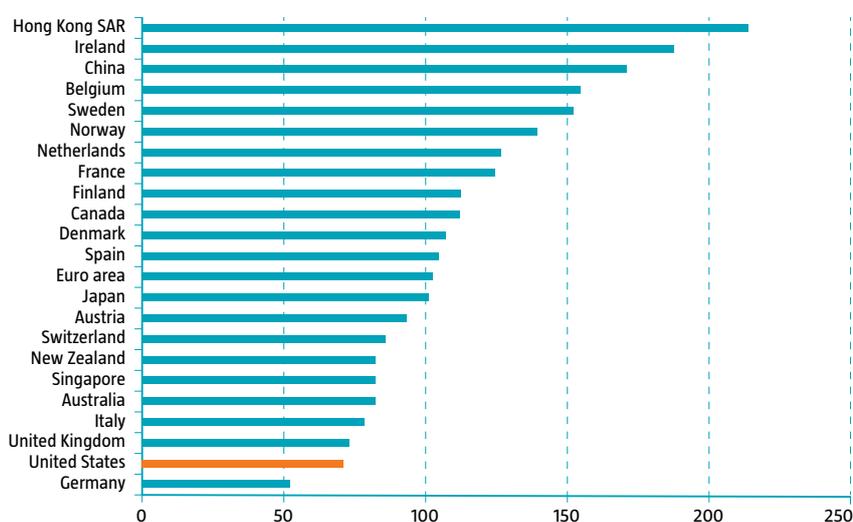
Source: Dealogic, Goldman Sachs Global Investment Research

no earnings potential linked to this increase in debt, but it does raise the risk of necessary refinancing further down the road. Leverage is on the rise, credit quality is weakening and defaults have started to pick up.

Although this does not sound very encouraging, the real question is whether we have already reached the critical levels necessary for the debt cycle to turn negative. Despite the worrying trends mentioned in the previous paragraph, the answer appears to be 'not yet'. For one thing, as alarming as the numbers mentioned may sound, they do not show up if we look at the aggregate numbers for the US corporate sector as a whole. As we have seen in Figure 2, US corporate debt as a percentage of GDP has risen by only 9% since 2005, bringing it to a level of 71%. True, this is an increase, but it's hardly worrying. Compared with its peers internationally, the US has a relatively low level of corporate debt, only 'beaten' by Germany. The high debt growth seen in the high yield markets must have been compensated by low (if not negative) growth elsewhere. What's more, debt has risen strongly, but so have cash holdings. Reported cash holdings have reached the USD 1.7 trillion this year, more than double the level they were at in 2007. This is also reflected in the changes in net debt/EBITDA: this measure of leverage has been on the rise since 2014, but is still below the average level seen in the 1999-2015 period. Elevated, yes, but hardly at the point of no return. Furthermore, debt may have risen, but interest costs have lagged considerably, as both interest and financing costs have declined in recent years.

So, can things go wrong during the next five years? As is more often the case, there are numerous potential scenarios with a negative outcome. A strong rise in interest rates, an ongoing deterioration of underlying earnings, a sudden drying up of demand for bonds or a further significant increase in debt levels during the first half of this timeframe could trigger a negative debt cycle. With the exception of the third of these potential issues, we do not believe these outcomes to be particularly likely at this stage. Much will therefore depend on what happens to debt levels from now on. The main risk appears to be one of fragmentation: certain, weaker parts of the debt market expanding too rapidly, with especially the high yield market at risk: ongoing low bond yields in combination with loose credit standards and ample liquidity will certainly create problems further down the road.

Figure 5: Aggregate US corporate debt is not threatening



Source: BIS, Robeco

Government debt in developed markets

Which brings us to the elephant in the room: governments. The reason why they get this label is simple: the government bond market acts as the benchmark against which all credit spreads are priced, they are the compass for all debt markets. If government yields drop, this almost automatically translates into windfalls for all debtors. As a result, government bonds are probably the main driver behind the whole debt cycle, as low yields act as a potent support for an ongoing debt bubble (which will ultimately burst), while higher yields can trigger payment and refinancing problems, especially if leverage is at an unhealthy level. Much will therefore depend on developments surrounding government debt and the related bond yields.

As for the changes in government debt levels, the picture is pretty clear: the developing world has recorded a substantial increase in debt in recent years. Governments acted as the lender of last resort during the economic collapse of 2007-2009, which led to high deficits across the board. In a four-year period, debt as a percentage of GDP rose by 30% for the advanced economies on aggregate, after which it stabilized at around the 100% of GDP level. From a historical perspective this is already high, but we should remember that this is the average level: Japan's government debt is already at the unlikely level of 220% of GDP. The problem here is that it is hard to see how such a country is still able to escape a debt meltdown. Due to its aging population, the Japanese economy continues to be characterized by low real (and nominal) growth, limiting scope for it to 'grow' out of its debt problems. At the same time, the aging element means that its population will turn from being net buyers of bonds to net sellers, as retirees begin to dissave. This feels like a textbook example of a debt cycle that is about to reach the tipping point.

Based on the significant increase we have seen in government debt, an outsider might conclude that the bond markets are in a state of turmoil. If the supply of debt has risen, debtors should have to offer a premium (=higher yields) to still tempt buyers in the light of worsened credit conditions. Looking at the current state of the worldwide bond markets, however, the exact opposite is true. Across many government bond markets, yields have dropped below zero, meaning that governments can actually get 'paid' to borrow right now. This is not only true for the triple A rated debt of Switzerland and Germany, but it even applies to the single A rated Japanese bond market: Japanese bonds with a maturity in excess of 15 years are trading at negative yields. If we are looking at these markets, the message seems to be pretty clear: there is way too little rather than too much government debt. This does not exactly sound like a debt cycle that is about to reach tipping point.

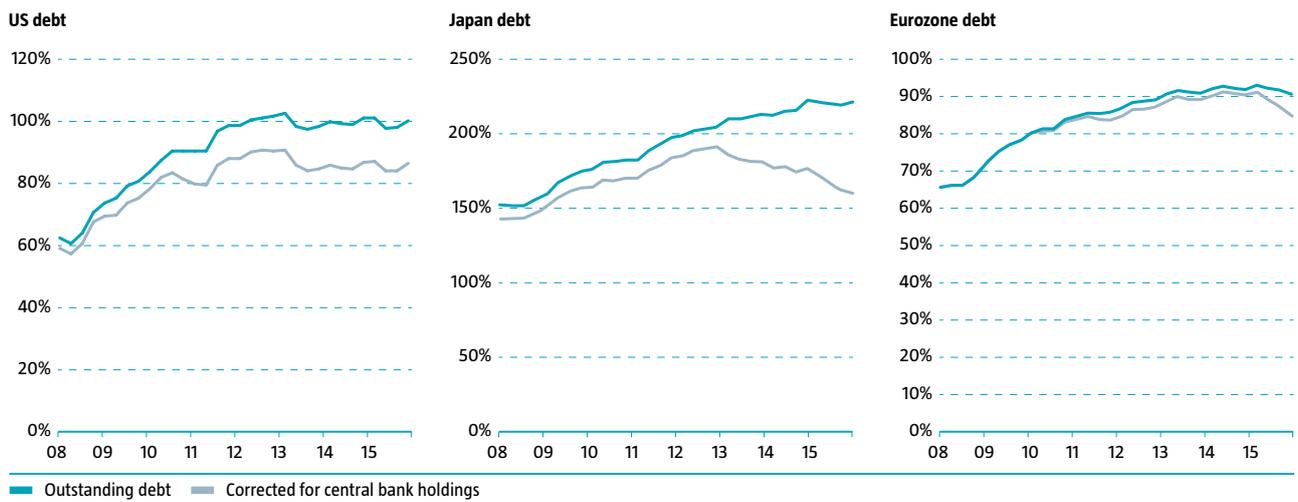
There are numerous structural factors that can potentially explain this demand-supply mismatch for government bonds, including the high level of savings (aging and wealth related), changed legislation in the financial sector (an attempt by authorities to 'de-risk' the banking sector), structurally lower growth and inflation rates as well as lower investment levels, also for governments.

Central banks play key role since 2008

However, there is no denying that a key role is also being played by the central banks of the world. Since 2008 all the central banks of the leading economies in the world have launched quantitative easing (QE) programs, buying substantial amounts of government debt. By the end of this year, over USD 7 trillion in government bonds will be sitting on central bank balance sheets. In fact, thanks to the various QE buying programs the net amount of outstanding government debt has steadily declined since 2013. Growing demand for bonds combined with falling (net) supply explains why bond yields are negative in so many countries around the world.

'The continuation of current central bank policy will pose one of the biggest risks'

Figure 6: Central bank bond buying affects net outstanding government debt



Source: European Commission

There are two ways of looking at this central bank policy action. On the one hand, it is clear that their role means that the risk of a collapsing debt cycle is limited, at least in the traditional sense of the word. To take Japan as an example, the dissaving of retirees is more than compensated for by the central bank, pushing yields into negative territory. In fact, central banks have already shown a willingness to extend their buying activities to include corporate debt as well. However, whether that is to be seen as a longer-term positive, is a different matter. Without prudent risk controls, there is a clear risk that these ultra-low yields could act as a catalyst for corporates and households to issue more debt, worsening the medium-term outlook for private sector debt cycles. From this perspective, it is questionable whether reducing rather than increasing the amount of outstanding government bonds is the right kind of policy to pursue. Furthermore, although the risk of a traditional debt cycle in government bonds is limited, the risk of a non-traditional confidence crisis regarding central banks is not. How will that play out? Flight to digital currency, a sharp yen depreciation-hyperinflation cycle – no one knows, but it is clear that Japan will once again be the place we need to keep an eye on. On balance, we think the continuation of current central bank policy will pose one of the biggest risks to the debt supercycle during the next five years: supply and demand for debt are being distorted, while the low (if not negative) yields act as an incentive to borrow, causing the current debt bubble to expand even further.

Conclusion

So will debt come back to haunt the financial markets over the next five years as the debt supercycle spirals out of control? We don't think so. But there are certainly some risk pockets that have the potential to create havoc. Developments at several governments and in some parts of the US corporate world have the potential to threaten their debt sustainability. Still, we consider there to be limited risk of a traditional debt cycle in government bonds and corporate debt. However, we do regard the risk of a non-traditional confidence crisis in central banks to be more likely. The current easy money policy of many central banks could backfire and cause such a crisis to occur as supply and demand for money are increasingly distorted by QE. China may kick the can further down the road and may run the risk of eventually having too much debt chasing too few investable opportunities. But these are risks, not our baseline scenario. We expect both China and central banks to stay vigilant and to be able to mitigate these risks, preempting the much feared debt supercycle.

2

Expected returns 2017-2021

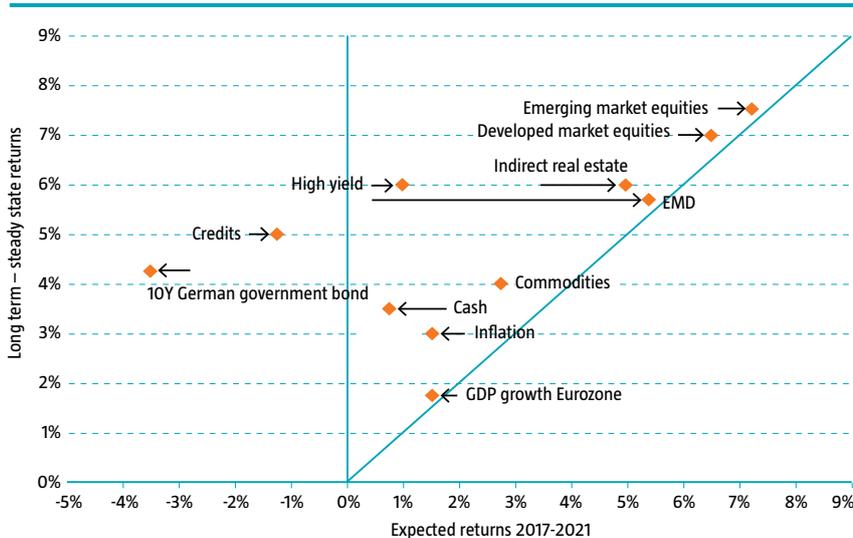
Nobel Prize winner Daniel Kahneman points out our tendency to ignore what he calls ‘base rate’ effects. That is, when predicting the future, we tend to focus primarily on more recent events, while largely overlooking those occurring most frequently in the distant past. It follows then that we can only properly formulate an outlook on five-year expected returns if we understand how various asset classes have behaved previously in economic environments similar to those deemed most likely to unfold in the next five years. However, in the words of Mark Twain, “History doesn’t repeat itself, but it often rhymes”. The comparison with historical situations only provides a basic starting point. The future economic and financial market landscape could very well prove substantially different from that observed in the most representative episodes of economic history.

For this reason, we focus on the factors that could modify this landscape. These factors are captured in our assessments on valuation and the macroeconomic environment for each scenario. Shiller (1988) and many others have stressed the importance of valuations for expected asset returns. Getting the macroeconomic environment right is crucial as well, as Ang and Ulrich (2012) find that macro factors are responsible for very wide variations in expected returns. From the macro viewpoint, the world is (as always) clearly in flux; for instance, the new oil order, the Chinese growth transition, negative bond yields, the waning effectiveness of monetary policy, the unstable catch-up growth of emerging markets, economic inequality, the rise of the anti-establishment vote, migration, terrorism and increasing evidence of climate change have regularly made the headlines this year.

In view of the first component, valuation, the dynamics are clearly diverse as well. We must therefore first take a step back and decide how valuations would look if the world were in a state of equilibrium. This 'steady state' approach is probably what Kahneman meant by the 'base rate'. First, for each asset class we assess whether valuations are currently in or out of line with 'normal' levels. Consequently, we add our valuation tilts, or the specifics that will shape the impact of valuations on returns. Second, we look at the state of the world economy and determine how the economic outlook for the next five years will impact returns. We think current global growth forecasts are too pessimistic as it's always darkest just before dawn. In our central scenario we present a fairly optimistic outcome, with a pivotal role for the consumer, as we expect wage growth to improve, with fiscal policy even transforming from a headwind into a tailwind for global growth.

Expansion phases do not die of old age and although this one has already outlived the average expansion cycle period, we expect it still has room to continue over the next five years. Central banks will retain their asymmetric reaction function, allowing inflation to run its course for some time, rather than choking growth with a linear tightening cycle, especially in a leveraged world. Additionally, we look at two alternative scenarios: stagnation and high growth. We arrive at return estimates for the coming five years based on an approach that combines macro and valuation tilts. This set of expected returns can, in our view, be used for strategic asset allocation decisions.

Figure 2.1: Expected returns 2017-2021 and changes in five-year expected returns (arrows)



Source: Robeco. Arrows show the change in expectations from last year's estimates.

Table 2.1 and the graph above summarize our outlook for 2017-2021 for the main asset classes. The second column shows the steady state, longer-term returns for each asset class, which are discussed in Chapter 3. The next column shows the effects of the current macroeconomic conditions on the returns of each asset class over the next five years, the macro tilt. These are the macro tilts in our base case scenario. The fourth column shows the impact of the valuation on the returns, the valuation tilt. In the remainder of this chapter, we discuss the underlying framework for this table in more detail. The chapter first discusses how valuation reflects the current state of pricing in the market, which is independent of our five-year economic scenarios.

Table 2.1: Expected returns 2017-2021 and changes in five-year expected returns (arrows)

	Returns	Medium-term influences*		Returns	Returns	Risk
	Long term	Macro	Valuation	2017-2021	2016-2020	Volatility
Consumer prices						
Inflation	3%	=		↓ 1.5%	1.75%	
Bonds*						
10y German government bond*	4.25%	-/-	-/-	↓ -3.5%	-3%	5%
Cash or money markets	3.5%	+	=	↓ 0.75%	1.5%	3%
Investment grade credit bonds	5%	-/-	+	↑ -1.25%	-1.75%	6%
Emerging market debt	5.75%	+	+	↑ 5.5%	0.5%	10%
High yield bonds	6%	=	+	↑ 1%	0.5%	12%
Equity-like						
Developed markets*	7%	=	=	↑ 6.5%	5.5%	18%
Emerging markets	7.5%	+	+	↑ 7.25%	6%	25%
Commodities	4%	+	=	= 2.75%	2.75%	25%
Indirect real estate*	6%	-/-	=	↑ 5%	3%	18%

* Bond returns are hedged to euro, while equities are in local currency. The medium-term influences correspond with our qualitative assessment on the valuation and macro influences described in Chapter 2. Medium-term influences on equities are relative to developed equities. Real estate is relative to equities. In line with the recommendations of the Dutch Association of Financial Analysts, the expected returns are geometric returns that are better-suited to long investment horizons. The bond has been derived as follows: starting with a new 10Y bond, we assume the bond is sold each year and that a new 10-year bond is bought with the proceeds. In this way we replicate a strategy in which the investor retains their investment in the 10-year benchmark bond. Note that the return will vary for other strategies such as a buy-and-hold strategy. The value of your investments may fluctuate, and past performance is no guarantee of future results.

Source: Robeco

2.1 Valuation

In this section, we take a look at the valuation of each asset class. Although valuation is not a timing factor for short-term returns, it has shown itself to be a relevant factor for medium- to longer-term returns. However, the sometimes impressive predictive power of valuation for future expected returns should not be overstated. Dimson, Marsh and Staunton (2014) warn that we learn “far less from valuation ratios about how to make profits in the future than about how we might have profited in the past”. Having said that, we think the valuation of assets definitely warrants attention as we are entering a period of monetary policy normalization. In the past, it has been more common to monitor the equity market for possible bubbles, but at this point in time, the bond market looks particularly unusual from a historical perspective, given the record low yields. We will address the valuation of the major asset classes.

2.1.1 Cash

Cash is the central building block of our asset valuation framework, as it is the benchmark you hope to beat by adding risk to an investment portfolio and thus the ultimate reference point for any investment process. At the same time, cash is somewhat elusive when it comes to valuation, as it is, by definition, a component that is not determined by the market, but depends crucially on the policy pursued by central banks. This raises the interesting question of whether central banks are in the business of giving the cash rate a neutral valuation, or whether they sometimes have other motives. This question is currently even more relevant, with interest rates below zero. Based on a tool like the Taylor rule, which captures the reaction function of central banks, it is clear that the European central bank in particular would like to move interest rates further into the negative territory, suggesting that they are actually too high at this point.¹ The other approach would be to look at the growth of the nominal economy, apply a liquidity discount and take that as the neutral valuation level. On the basis of this metric, rates are too low, especially in the US.

1. See our macro tilt section on cash for a more detailed discussion of the Taylor rule.

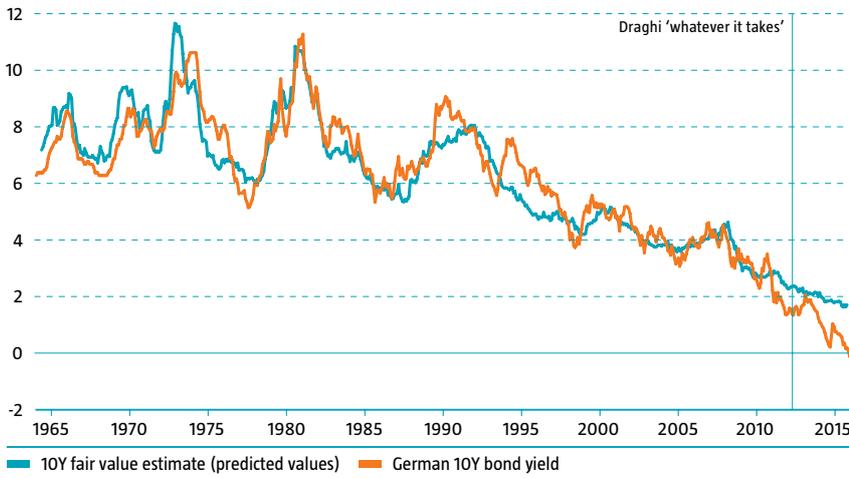
As interesting as this discussion is, making a judgment call on whether rates are too low or too high from a longer-term perspective does not have much of an impact on the expected interest rate trajectory we expect for the next five years. As there is no market force that determines the level of rates, it is up to central banks to determine which path we are going to follow. As such, we prefer to abstain from making a qualitative call and instead will assess the path of rates on the basis of the macro tilt of the three scenarios.

2.1.2 Government bonds

The government bond market is in a historically unprecedented phase, with a steadily growing part of the global bond market experiencing negative yields. Despite blips in the steady decline in bond yields, for instance the 'taper tantrum' in 2013 and more recently the April 2015 sell-off in the European bond market, bullish sentiment in the sovereign bond market has remained intact. Besides a parallel downward shift in yield curves, the curve in developed markets has also flattened further in the last year. As negative yields at the shorter end of the curve make these bonds ineligible for its buying program, the ECB has increasingly been buying up the longer maturities. Curves have also flattened due to expectations of continuing dovish monetary policy in the long term. Developed market central banks have kept excess liquidity in the system, also creating additional demand for bonds. Of course, central bank policies are not the only explanation for the negative yields the market is discounting; weak aggregate demand and a bias towards deflation have also intensified the trend towards ever lower yields.

The big question is whether this trend of negative yields is warranted from a valuation point of view. As a first observation, in recent years the disconnect between actual bond market behavior and traditional fair value models has grown. For the past 50 years, industrial production, short-term money-market rates and CPI inflation numbers have done a decent job of justifying the German Bund market yield moves. But this picture has changed in recent years as the influence of unconventional central bank policy has become increasingly apparent, forcing a wedge between traditional macro factors and bond market behavior.

Figure 2.2: Eurozone fair value proxy versus actual yield

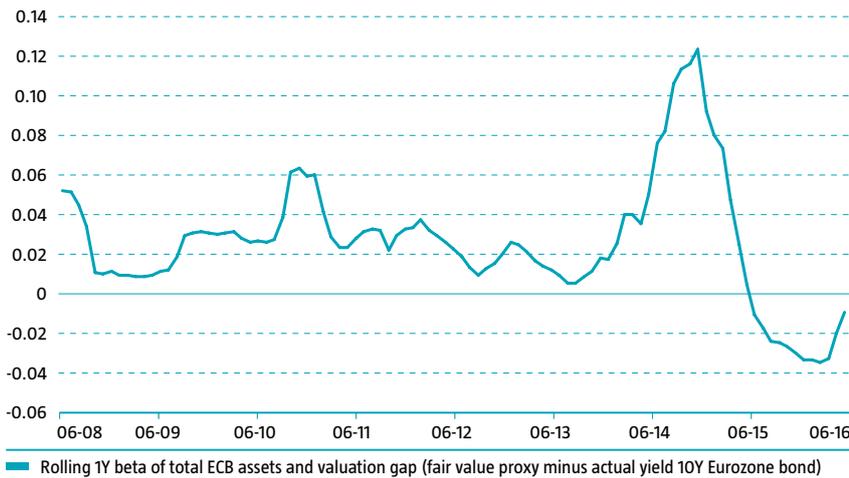


Source: Thomson Reuters Datastream, Robeco

The surge in central bank sovereign bond buying has distorted the signals given by these traditional market factors, leaving German 10-year bond yields 150-160 basis points below their model implied yield. In our opinion, the ECB balance sheet expansion is a pretty valid explanation for this wedge, so in this sense the market is expensive for a reason. However, we think this distortion in market pricing created by central banks is temporary and will gradually disappear in the medium term. We expect the pricing power of traditional factors like inflation and economic activity to regain strength over the next five years as we observe that QE is now already becoming less effective in driving yields further away from their fundamentals.²

2. On a more technical note, we calculated a one-year rolling beta of the wedge (defined as the difference in bps between model-implied and actual yield) versus the ECB balance sheet (y-o-y change) and observed that the beta dropped steeply after the ECB started fully-fledged QE and has remained negative ever since. This negative sensitivity implies that ECB buying is becoming less effective or even ineffective in driving yields further away from fundamentals.

Figure 2.3: Eurozone bond valuation 'wedge' and ECB total balance sheet changes



Source: Thomson Reuters Datastream, Robeco

Another way to look at bond valuations, is to study the methodology used to derive our steady state expectation for bond yields. According to this methodology, steady state yields are calculated by taking real growth and inflation figures and subtracting a 0.25% risk premium for the lower risk profile of bonds compared to risk relating to the growth of the real economy. If we take the long-term consensus growth estimate of 1.5% for the Eurozone and add either the long-term consensus inflation estimate of 1.5%, or the priced in inflation figure of 1.35%, it is clear that current yields are way below what can be considered equilibrium levels.

The main question is of course whether this historical/market approach is still relevant at a time when central banks are buying up and now own a substantial part of the bond market. The answer is: probably not. As long as central banks are willing to buy bonds at all costs, there is no reason why yields should not continue to fall, no matter what. Japan is a clear example of how far this ‘manipulation’ can go: despite a gross debt in excess of 200% of GDP and a population that is starting to dissave as more people retire, the Japanese 10-year yield has continued to trend lower, dipping as low as -25 basis points. In a sense, the question of whether bonds are overvalued or not boils down to whether we believe that central bank involvement in the market is here to stay or not. In the case of Japan, this is easy. The ‘natural’ buyers of the Japanese government bonds are turning into sellers and there is no international interest for these bonds so without the central bank, the

Beyond traditional bond factors

Are bonds expensive or not? Some might argue that ‘overvalued’ is quite a bold statement as classical risk factors like inflation and growth could very well overlook new pricing elements in the bond market, above and beyond the much discussed surge in unconventional monetary policy. Recent literature, for instance Joslin et al. (2014), finds that ‘unspanned’ macro risks beside traditional inflation and growth factors have accounted for much of the variation in forward bond premiums. They suggest that some of these as yet unexplained, ‘unspanned’ macro risks could be related to global imbalances and disruption in financial intermediation. If we incorporate a proxy for the global imbalance between savings and capital demand in our original regression for the 10-year Eurozone bond, we find some confirmation for this theory. But even then a forward-looking market should be discounting yields that are higher rather than lower than those currently implied by our model as the high level of global savings is expected to decline, rather than increase in the next five years, at least according to the IMF. There are also other elements that strengthen our conviction of overvaluation.

A behavioral bias could prove to be a viable explanation for the existing gaps between bond market fundamentals and actual pricing. Due to a short-term bias, as documented in Kahneman and Tversky (1982), it is overreaction that is causing the continuing negative growth surprises (the US has just experienced its longest ever episode of negative macro

Figure 2.4: Fading savings glut – global excess savings (savings minus investments) as % of global GDP



Source: Thomson Reuters Datastream, IMF, Robeco

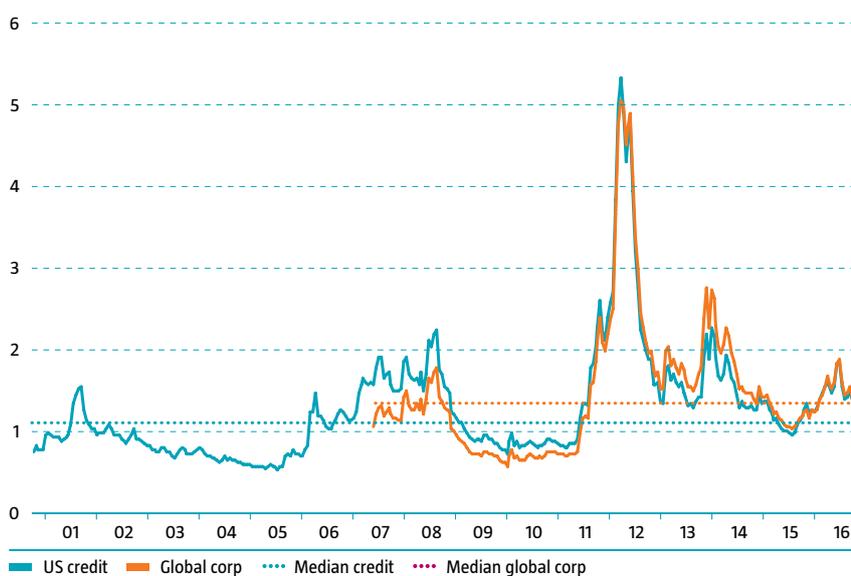
data surprises) and deflation scare to be extrapolated into the future. For inflation, we have recently seen partial evidence of a kind of bounded rationality in the strong co-movement of oil prices and medium- to long-term inflation expectations. Another example may well be the secular stagnation hypothesis itself. Extrapolating the current low productivity growth environment far out into the future is potentially dangerous as the non-overlapping correlation between five-year cohorts of per capita GDP growth is historically very low. Expect the unexpected.

bond market could potentially collapse, with dire consequences for the broader economy. In this case, the central bank has few other options. We believe that the situation for the European and US bond markets is a lot less threatening (lower overall debt, better growth perspectives). For example, we do not think that the European bond markets have yet reached the level of no return. So even though central bank policy will continue to play an important role in the first part of this five-year period, we expect fundamentals to gradually return to the forefront.

2.1.3 Investment grade credits and high yield

For the valuation of investment grade (IG) credits and high yield (HY) we concentrate on the evolution of the credit spread. We use global credit spread data to determine the valuation of these asset classes. HY spreads at a top-line level are more or less neutral compared with the historical median spread. However, IG valuations have improved further, with current spread 30 basis points above the historical median spread as measured versus the longer dated US data.

Figure 2.5: Investment grade spread over government bonds (in %)



Source: Bloomberg, Robeco

Purely from a historical spread comparison, global IG seems attractively valued. All in all, we think that the valuation of investment grade has improved compared to government bonds, which is why the valuation tilt is now a plus from neutral last year. As for high yield, current global spreads are now around 530 bps, just below the median spread of 550 bps observed since 2000, but clearly above the median spread of 470 bps observed in the US since 1994. The HY market has seen significant spread widening as a result of the continuing slump in oil prices last year, which mainly affected the US HY oil & gas issuers. As the oil market started to rally in spring 2016, global spreads compressed more than 300 basis points.

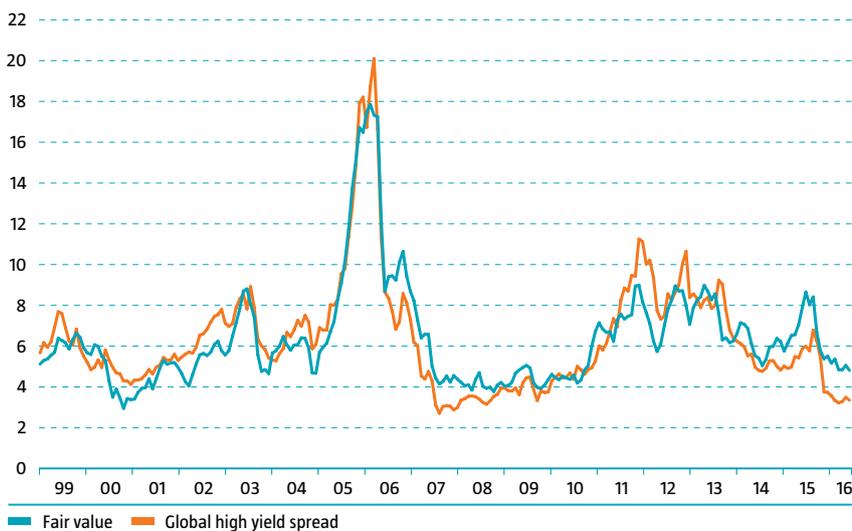
Figure 2.6: High yield spread over government bonds (in %)



Source: Bloomberg, Robeco

Furthermore, we look at the HY spreads from a top-down macro fundamentals view. For this we used a simple regression, of the global HY spread against the US Kansas financial conditions index, the realized sovereign bond volatility and the ISM manufacturing index. All variables are significant on a 2% significance level. Based on this macro top-down model, HY spreads are somewhat cheap as of the end of Q2 2016, with model implied spreads 65 basis points below actual spreads as of June 30.

Figure 2.7: Macro fundamentals (in %)



Source: Thomson Reuters Datastream, Robeco

Next, we look at HY spreads from a more bottom up corporate fundamentals view. For this we used a monthly regression of the global HY spread against the global interest rate coverage, net profit margin and net debt/equity as a leverage proxy. Only the net interest coverage turns out to be (very) significant on a 1% significance level. Using this restricted model we find that based on interest coverage ratios, the global HY spread is around fair value. We can draw two observations from this. First, the market worries about deteriorating interest coverage ratios are somewhat overdone as spreads are compensating for this, although a further deterioration in interest coverage is benefitting IG compared to HY (see Figure 2.30). Second, the macro fundamental model explains a lot more of the historical variation in spreads. In summary, from a standalone point of view, high yield is not expensive as such, we now value it neutral. We remain positive on high yield valuations compared to government bonds.

2.1.4 Emerging market debt

In this section, we concentrate on the valuation of unhedged emerging market debt (EMD) in local currency. This asset class offers higher yields together with higher credit ratings than high yield. But, in contrast to high yield and developed market government bonds, it is exposed to considerable emerging market currency volatility and a higher duration risk. A basket of emerging currencies (JP Morgan EM Currency Index) indicates a 60-month rolling correlation of 0.84, with monthly EMD unhedged in local currency returns, while the duration is around 7 for EMD and only 4.5 for HY. So, valuation of this asset class implicitly requires a valuation of both the yield component and an emerging market currency valuation versus the US dollar.

First, we look at the yield component. The difficulty here is the lack of historical data: for the JP Morgan EM Debt Index we only have data from 2003. But for the BofA Merrill Lynch Emerging Markets External Sovereign Debt Index (in local currency) we have data running back to 1992. Compared with this longer period, which includes several EM crisis episodes in the 1990s, we find that the EM yield is 90 basis points below the average yield. As the average yield is heavily skewed due to the EM crisis episodes, a comparison against a more recent 10-year average shows there is now some value in EMD, as spreads are 35 basis points above the average yield. This conclusion holds when we look at real yields on a currency risk adjusted basis³.

3. Dividing the real yield by the JP Morgan EM FX volatility index.

Figure 2.8: Real yield EMD issuers

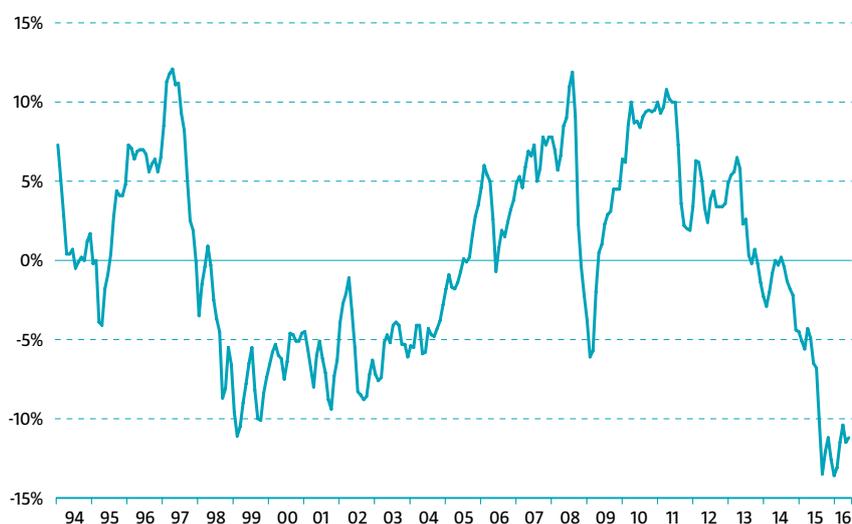


Source: Thomson Reuters Datastream, Robeco

Second, we investigate currency movements in purchasing-power-parity terms compared to their trading partners. We look at the average deviation from trend in the BIS real exchange rates for the top 10 EMD issuing countries. This valuation metric for long-term currency valuations shows that the ten major emerging market debt issuing countries are currently 9% below their long-term real exchange rates, which means emerging currencies are cheap. Although EM currencies have recently rallied, the current degree of undervaluation has only been seen since the aftermath of the Russian ruble crisis.

Looking at the yield component and the EM currencies, we find local currency EMD to be cheap relative to the steady state, but would like to once again stress that the overall return is tightly linked to the exchange rate component and volatility is therefore also a lot higher.

Figure 2.9: Deviation from FX fair value of EMD top 10 issuers

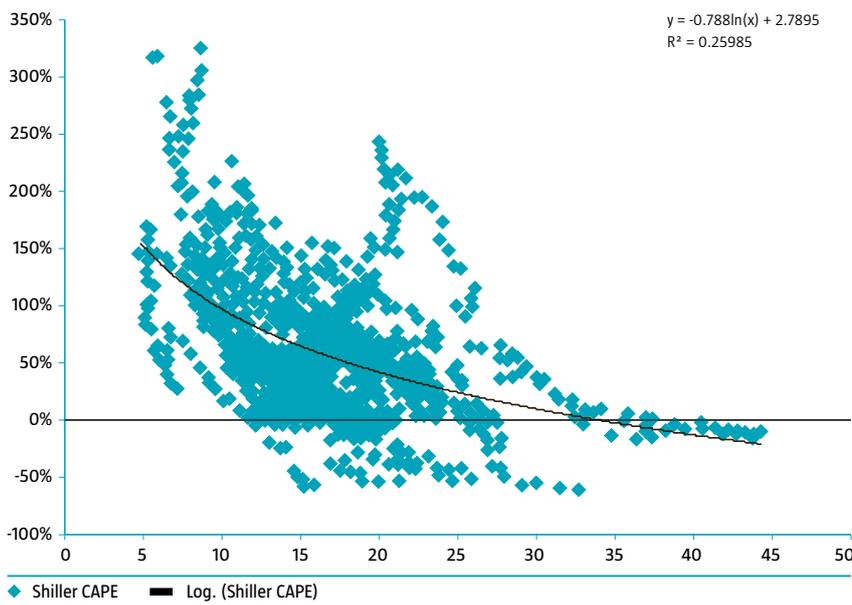


Source: Thomson Reuters Datastream, Robeco

2.1.5 Global stocks

Our preferred approach to determine the valuation of stocks is the well-known Shiller measure, or cyclically adjusted price earnings ratio (CAPE). This measure can be considered a relatively conservative way of looking at stock market pricing, as it takes the 10-year average of earnings as the basis for looking at current pricing levels. The underlying idea of this method is to filter out the volatility of the business cycle, creating much more stable earnings projections. The main drawback is that it is retrospective: in a scenario of rapid earnings growth, this measure will lag considerably. Despite this, the track record of the Shiller PE as a predictive tool has remained very competent compared to other valuation measures like Tobin's Q or the equity risk premium (ERP).

Figure 2.10: Shiller CAPE versus subsequent five-year returns

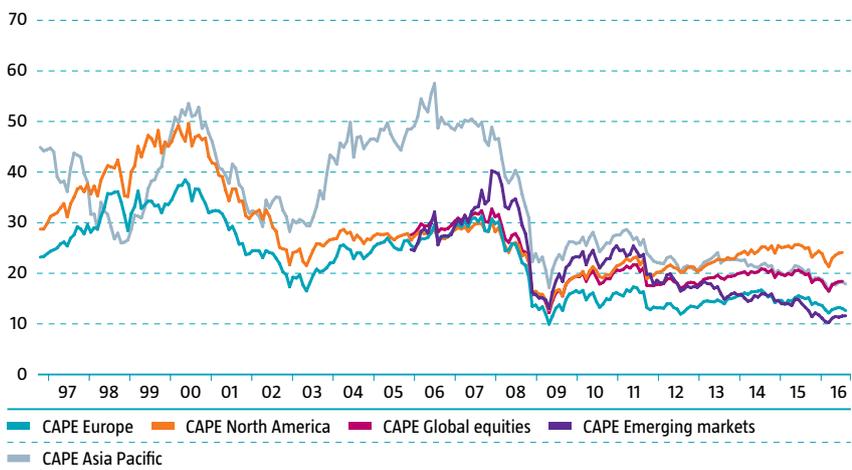


Source: Shiller database, Robeco

The chart shows the level of the CAPE for the S&P 500 and the subsequent five-year total stock returns. This analysis shows that as multiples expand and stocks get more expensive, the historical average future return on a five-year horizon declines. The current CAPE of 26.2 is currently 58% above the average CAPE of 16.5 observed since 1881 and suggests below historical average returns in the next five years. These returns are also typically accompanied by higher volatility. As shown in a previous edition of Expected Returns, the volatility of five-year future S&P 500 returns is notably higher when the Shiller CAPE exceeds the threshold of 25.

Rather than restricting ourselves to the original Shiller CAPE, which is US specific, we have constructed a worldwide measure as well as other regional proxies based on the Shiller methodology.

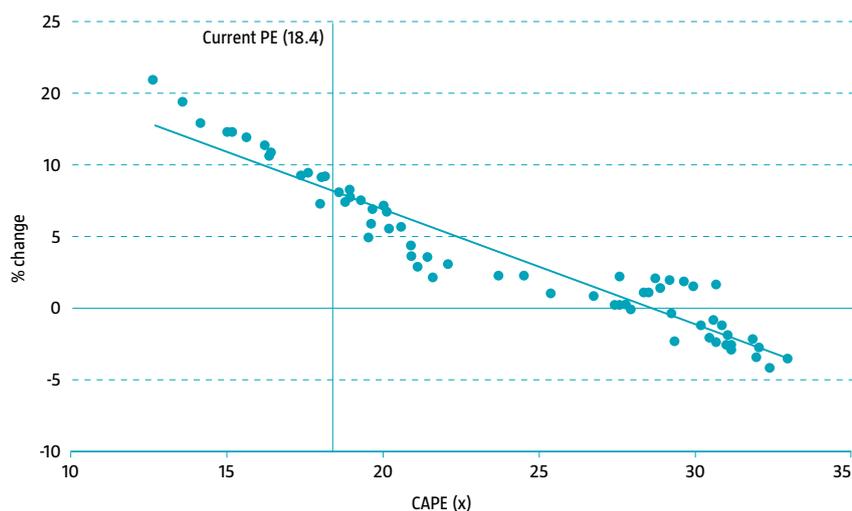
Figure 2.11: Regional CAPE



Source: Thomson Reuters Datastream, Robeco

Looking at these measures, we find that global stocks are currently roughly 10% overvalued, a lower premium than we saw last year. This implies that prospects for global stock returns have brightened up, as can be seen from the slightly above average implied five-year subsequent return at the current global CAPE level of 18.4.

Figure 2.12: Global CAPE and subsequent five-year returns



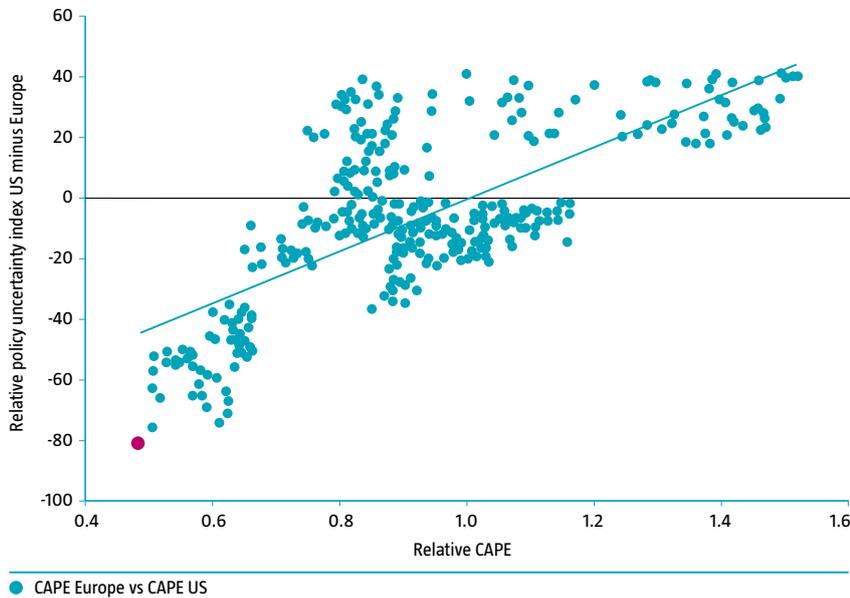
Source: Thomson Reuters Datastream, Robeco

Looking at the CAPE from a regional perspective, emerging market equity valuations have become more attractive since last year and we have seen the first signs of a market rotation towards emerging market stocks in 2016 after years of underperformance, which has lifted valuations somewhat. However, our special topic on emerging markets addresses the issue of the relative slowdown of growth in China compared to developed markets and how this indicates that investors should perhaps require an even greater valuation discount in the years ahead.

European equity performance has been struggling despite below average absolute and relative CAPE valuations in the past five years. The caveat for European equities is that, after the Greek saga, political risk has become even more pronounced with a widespread increase in anti-establishment sentiment, the migrant crisis and Brexit, and investors subsequently demanding a higher risk premium. The relative Policy Uncertainty Index shows that political uncertainty in Europe has not been as elevated as it now is compared to the US for 30 years. Caution is needed as the European valuation discount will not simply mean revert until the continent convincingly starts to repair confidence in its institutions.

For the Asia-Pacific region, multiples have also contracted on the back of a stronger yen, faltering Abenomics and the Bank of Japan's increasing hesitancy to pursue additional QE.

Figure 2.13: Relative policy uncertainty and relative valuation



Source: Thomson Reuters Datastream, Robeco

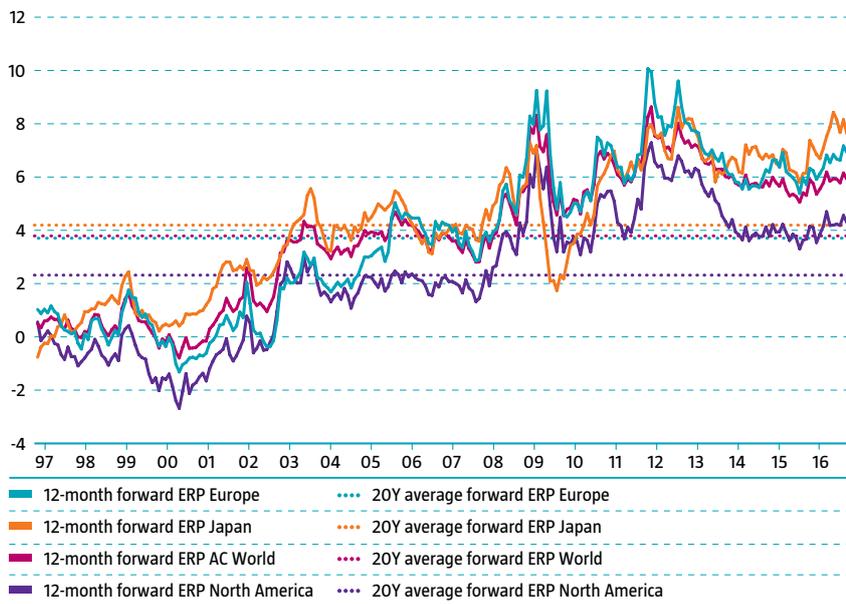
Equity risk premium

We also look at the equity risk premium (ERP) as an alternative valuation measure. This measure looks at the so-called earnings yields, (the inverse of the PE) compared to the yield of the other alternative, the yield in bond markets. Apart from the fact that current earnings do not provide the same kind of certainty as a coupon on a bond (which is normally fixed until maturity), and that there is no certainty that an investor can lay claim to those earnings (dividends can be reduced to zero), its main drawback is that it is a relative measure. A high ERP can be a sign that stocks are indeed cheap, but it could just as easily indicate that bonds are very expensive, or a combination of the two. Therefore, one should discount our view that sovereign bonds are overvalued when looking at the equity risk premium.

Nevertheless, also from this relative valuation angle, perspectives have improved for equities. We use the ERP to look at the regional split. US equities now show an equity risk premium of 4.2% over bonds, exactly the level of the historical average equity risk premium since 1900. The European equity risk premium is 6.7%, compared with the average historical equity risk premium in Germany (the closest proxy) of 4.8% since 1900. Note that Japan is looking particularly cheap on this metric, with the ERP a full 3% above its long-term ERP of 4.8%.

Combining these two measures we conclude that equity valuations are on average neutral (compared to negative last year), although there are some clear regional differences.

Figure 2.14: Regional equity risk premiums (in %)



Source: Thomson Reuters Datastream, Robeco

2.1.6 Listed real estate

We primarily compare real estate to equities as this asset class tends to have equity-like volatility. For this purpose, we have also developed a CAPE-like valuation metric for listed real estate to compare valuation levels with those of global equities.

Figure 2.15: CAPE real estate

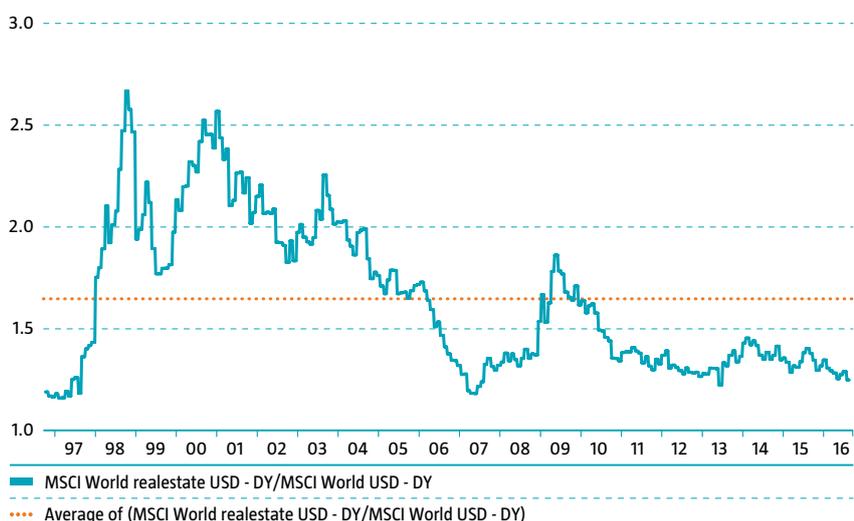


Source: Thomson Reuters Datastream, Robeco

From a CAPE metric perspective, real estate is currently less expensive than global equities as a whole, but more expensive than European and emerging market equities. Valuation ratios compared to global equities have improved somewhat since last year as capital market rates have declined further.

The relative dividend yield is now roughly 1.3x above that of stocks, which is 20% below the average level observed in the past 20 years (Figure 2.16). This seems to suggest that in terms of the dividend yield metric, real estate is overvalued compared to equities, partly as some of the capital searching for additional income in this negative yield environment has ended up in real estate. With relative dividend yields at almost their lowest levels for a decade and the Fed expecting to continue further tightening, the strongest part of the real estate performance recovery is probably behind us. Nevertheless, combining the dividend with the CAPE measure, we believe global real estate to be neutrally valued compared to stocks.

Figure 2.16: Relative dividend yield real estate versus equities (in %)



Source: Thomson Reuters Datastream, Robeco

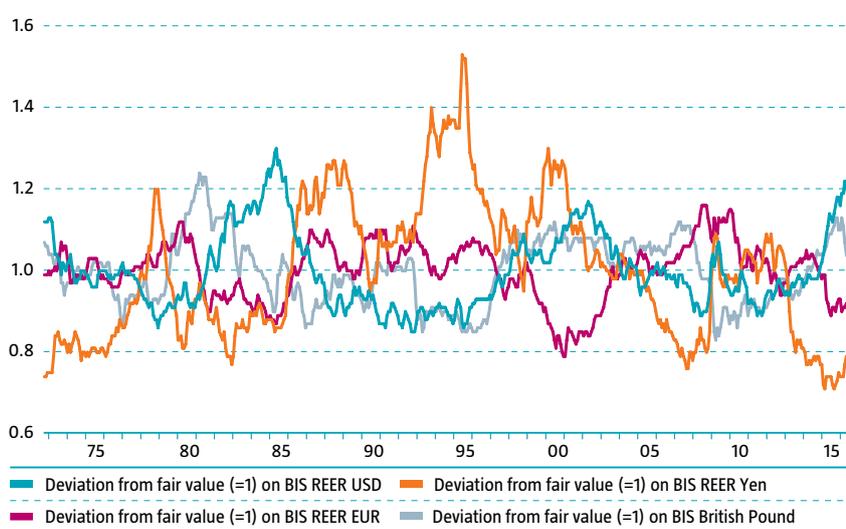
Valuation of currencies

In the 2016-2020 edition of Expected Returns, we developed a framework for valuing developed market currencies based on the concept of purchasing power parity (real exchange rate). In this section we apply this framework to update the five-year directional expectations for the major currencies. Institutions like the BIS and OECD compile CPI-based real exchange rates. To investigate the expected change in the real exchange rate, we calculated the deviations in the BIS real effective exchange rate (REER) from its long-term trend. In the long run, relative PPP holds and the expected real exchange rate should be equal to its steady state value ($Q_e \text{ USD/EUR} = Q \text{ USD/EUR}$ or '1' in figure 2.17). This figure illustrates the deviations from 1 for the major currency pairs. The current deviation from fair value is expected to mean revert, so we assume that it is equal to the expected change in the real exchange rate over a five-year horizon. There is ample literature confirming the real exchange rate's tendency to revert to the mean (Rogoff 1996, Frankel, Rose 1996, Hegwood, Papell 1998, Lothian and Taylor 2004).

Based on this framework, in last year's publication, we wrote that the dollar and pound would depreciate against the euro and the yen would strengthen in the next five years.

Now one year later, we are already starting to see the EUR/GBP and the EUR/JPY crosses moving in this direction. The overvaluation of the pound against its trading partners has almost disappeared since Brexit, while the yen has appreciated 13.2% against the euro in nominal terms. Looking at the current deviation from fair value (graph below) the dollar is still 18% overvalued on this metric. Since Brexit, the pound has depreciated to more neutral territory, while the yen still looks cheap, now 16.5% below fair value. From a valuation point of view, we expect the yen to appreciate further against the euro in the next five years and the dollar to depreciate against the euro. The pound is now more neutrally valued against the euro.

Figure 2.17: Deviation from trend PPP major currencies



Source: Thomson Reuters Datastream, Robeco

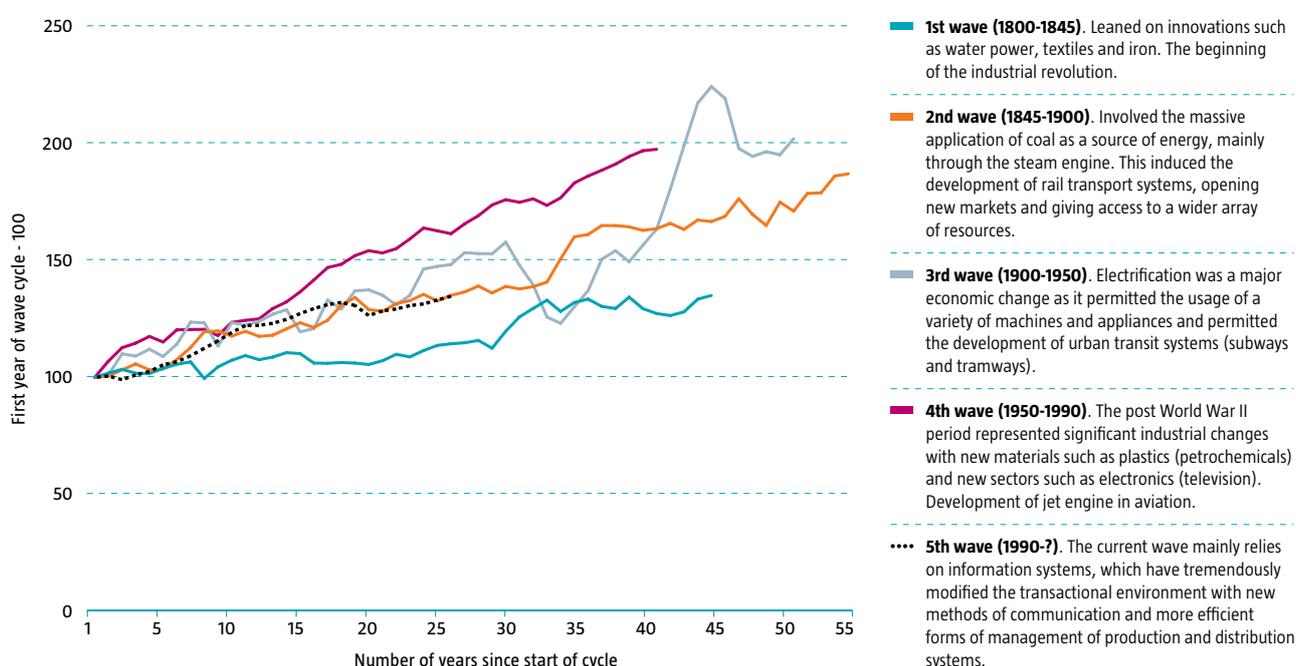
2.2 Macro tilts in financial markets for 2017-2021

In some ways it looks as if 2016 is turning out to be yet another rather disappointing year from an economic point of view. At the beginning of the year, the Eurozone finally seemed to have reached escape velocity, breaking out of its longer-term trend growth. Sentiment was however hit by the outcome of the Brexit vote, which led to increased uncertainty on the future of the Eurozone, as well as new concerns surrounding the banking sector in its southern countries. On the other side of the ocean, the US appeared to be gearing up for a series of rate hikes and a gradual normalization of the bond market. Sadly, this failed to materialize. The significant decline in oil prices was the disruptive force, curbing the positive investment process in one of the more dynamic parts of the US economy (shale) and raising uncertainty for the growth outlook for the economy as a whole.

The fact that this decline in oil prices had a negative rather than positive effect on consumers, is another sign that the world economy is still fragile at best, and unable to move much beyond second gear. There are also numerous potential risks – or should we say challenges? – that we might be facing over the next five years. These range from further disintegration in the European economy (Brexit, the rise of populist parties, Italian banks), a Chinese hard landing (unsuccessful rebalancing of the Chinese economy), a rise in protectionism (the Trump factor), the loss of credibility of central banks (Japan), as well as the onset of an adverse debt cycle (see our special topic).

Faced with this environment, it is both easy and tempting to use the current situation to extrapolate what will happen in the future. In fact, talking with our clients and looking at the expectations priced into the markets, the broad consensus appears to be disappointing: subpar growth from here to eternity. But we do not think this is very likely. And history is on our side in this: historical correlations between non-overlapping five-year per capita GDP growth are close to zero according to Blanchard (2016). Looking at previous innovation cycles since the Industrial Revolution, it would be premature to conclude that we are permanently stuck in a secular stagnation scenario. GDP per capita growth in the US is still tracking the average cycle.

Figure 2.18: US productivity growth during long-wave innovation cycles



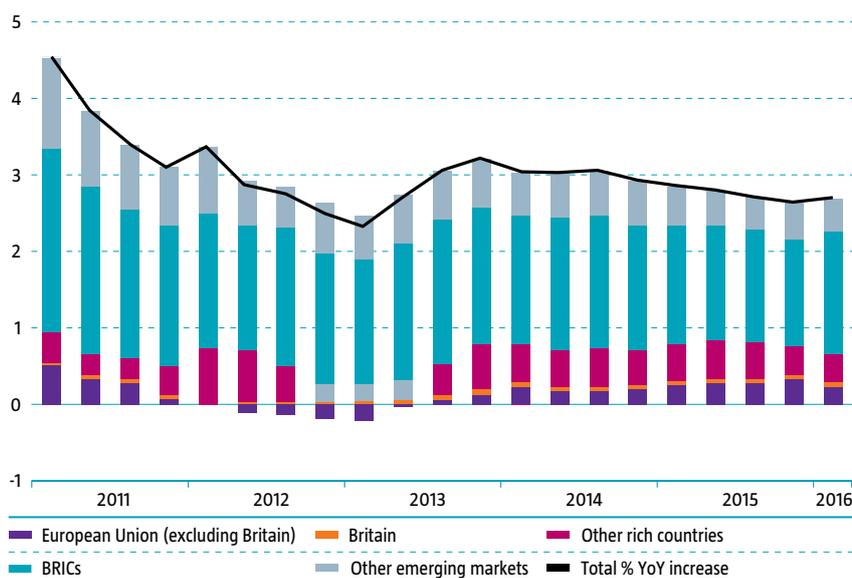
Source: Angus Madisson database, Fed data, Robeco

But more importantly, we don't think the current status quo is sustainable. One fact overlooked by many is that despite the very weak numbers, employment growth has been rather strong. Unemployment rates in all of the leading economies are currently below their longer-term averages, which means that using the last five years as a basis to predict future developments is simply not feasible. Add the effect of the aging population and it is clear that – even with the lower growth rates we have seen over the past five years – tightness in the labor market will pose a serious threat to any status-quo scenario. So either tight labor markets will lead to the return of wage inflation and stronger consumer spending, or growth will succumb to one of the many risks we have just mentioned. But we do not believe the middle route is plausible.

Much like last year, we believe we can make a good case for a scenario where the current period of weakness is about to end, opting for continued normalization as our baseline outcome. Perhaps we are optimists, but looking at underlying growth and inflation assumptions, we are not really predicting anything out of the ordinary: the world economy, including the emerging markets, will grow by roughly 3%, global inflation will reach

an average of 2.5% and 2% for the developed world. At the same time, we are not blind to the risks prevalent in the current environment. To reflect the increased risk relating to issues like the wave of populism and the China's possible hard landing, we have lowered the likelihood we attach to our baseline scenario, from 70% to 60%. The odds of an adverse stagnation scenario developing have increased and we now put this at 30%. In this scenario, growth will halve compared to the last five years (1.5%), while deflation will become a recurrent phenomenon. The third scenario, one of high growth (10%), is the one in which the world economy will accelerate, with inflation as the main risk. We will next discuss these three scenarios and the implications for asset allocation.

Figure 2.19: World GDP (in %)

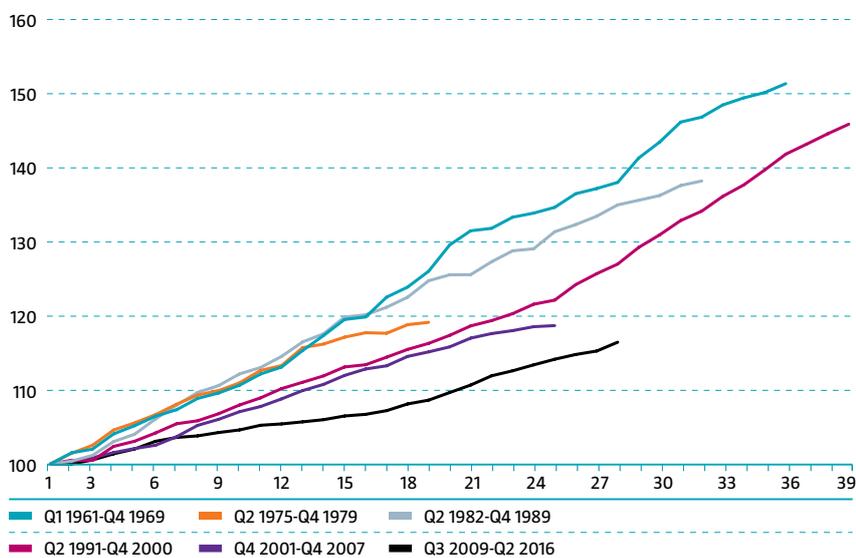


Source: Haver Analytics, IMF, *The Economist*

2.3 Baseline scenario (60%)

Why do we continue to be optimistic? One reason is the aforementioned developments in the labor market, unemployment rates in the leading economies are now increasingly close to reflecting full employment levels. So far, wages may not have picked up, but there are increasing signs that this might just be a matter of time. Disposable income has been boosted by the drop in oil prices, while household balance sheets have generally improved. The upside is clearly evident, also if we compare the changes in US consumer spending in the current upcycle compared to previous cycles: we are witnessing the weakest consumer rebound on record.

Figure 2.20: US consumption expenditure paths during a NBER expansion phase
(start of each NBER expansion phase = 100)



Source: Thomson Reuters Datastream, Robeco

We should also take into account the shift in stimulus we expect to see – from central banks to governments. In the Eurozone and the US, governments are no longer a drag on economic growth. There is growing consensus that an overreliance on monetary policy will not be enough to propel the world economy into a higher gear. A stronger Japanese government, new US and French presidents and a new German government all installed before the end of 2017, may well result in a more effective macroeconomic policy mix. One of the factors behind the current unsatisfactory growth rates is the lack of public fixed capital investment. This could all change in the course of 2017. With an uptick in growth rates, it is also likely that the so far disappointing wage growth will improve and inflation will finally increase over a five-year horizon. Helped by the improved global economic outlook, the Chinese authorities have succeeded in gradually rebalancing their economy by reducing the emphasis on investments and exports and allowing more room for domestic consumption. They have accepted a gradual reduction in the structural growth rate and have succeeded in reducing the extent to which the Chinese economy is leveraged.

Although this may sound like a pretty optimistic view of the world, we would like to stress that growth estimates are still pretty muted for two reasons. On the one hand, the lower labor force growth rates (aging) will exert downward pressure on growth in both Japan and Europe. While we also expect Chinese growth rates to continue to move to lower (and more realistic) levels, as the combination of high debt and the transition from investment- to consumer-driven growth takes its toll. On balance, we expect global economic growth of around 3%. As we have already said, in this scenario we expect tightness in labor markets to become more apparent, which is also reflected in the uptick in inflation we forecast over this timeframe. But our prediction of 2% inflation in Europe and 3% in the US by the end of this five-year period is hardly shocking.

2.3.1 Cash

Cash used to be king. Now, with cash and bond rates negative in various parts in the world, it has become a headache: low risk comes at an ever increasing price. The prevailing view in the market is that lower trend growth and a higher propensity to save have brought down real rates. Some, like Piketty and Gordon, have argued that rising income equality has

aggravated the propensity to save as richer people save more. Lower investment demand has also contributed (Rachel and Smith, 2015), as has greater demand for safe assets (Broadbent 2014). Although this may be true for the longer-dated bond market, there is no denying that the cash market is dominated by the response function of central banks.

Looking specifically at the European situation and ECB monetary policy for the next five years, there are a couple of points to be made. For one, those factors that caused lower rates after the financial crisis are already diminishing. In our baseline scenario, there is more willingness and capacity for fiscal stimulus in the Eurozone which could reinvigorate growth and raise capital investment demand. The strong rise in populist political movements will push governments into fiscal expansion. Second, as the European bank deleveraging process moves into a mature phase, stronger lending to the private sector in the next few years could have a powerful positive knock-on effect on the real economy. We expect the Eurozone to show average growth of 1.5% in the next five years.

And then there is fading deflation. Deflation is the canary in the coalmine when it comes to warning us of slack in the economy. In our base case scenario, we expect this slack to gradually disappear, creating inflationary pressures instead. First, unemployment has been on a steady downward path since 2013, indicating a further tightening of the Eurozone labor market and creating wage pressures around 2020. Unlike the Japanese experience of the last few decades, core inflation in the Eurozone has not drifted to zero. The same holds for the GDP deflator, a broader measure of price movements in the economy. This suggests deflation in the Eurozone has not become entrenched, which can also be seen in the inflation bond market. The absence of anchored deflation expectations in the Eurozone also implies inflation could, as we expect, return to ECB target levels as aggregate demand picks up. Headline inflation will pick up earlier as the commodity (notably oil) market rebalances in the next few years after the recent supply shock.

In short, and if our baseline scenario plays out, we can expect an ECB policy shift away from the current dovish stance in the next five years. If we incorporate the forecasts for growth and inflation that correspond with our base case in a so-called Taylor rule, we can spell out in more detail how the ECB is likely to react.

Shift to hawkish stance will not come overnight

The Taylor rule is a simple, but relatively robust rule that quantifies how much central banks should adjust policy rates as a result of changes in inflation and output to balance the aggregate demand for money with the aggregate supply. As American economist John Taylor suggested in a 1993 paper, central banks should target a rule to achieve a policy rate that matches the two main goals of monetary policy: a) price stability and b) stable real economy running at full employment. Our version of the Taylor rule assumes that the ECB changes interest rates in response to two deviations:

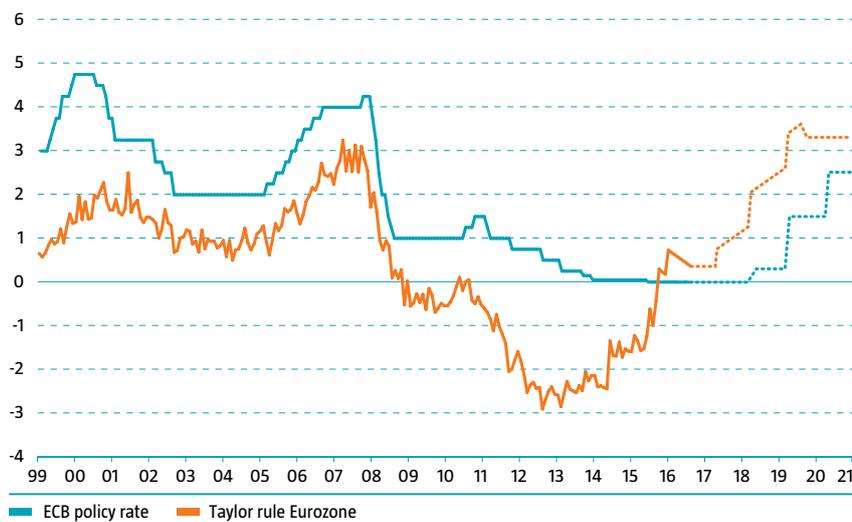
- Deviations between forecast inflation and the ECB's target; and
- Deviations between forecast unemployment growth and estimated non-accelerating rate of unemployment (NAIRU).

Historically this rule has been able to explain the past policy rate trajectory of major central banks.¹ It gives us an insight into the path that central banks, given their policy targets, should be following to normalize policy rates after the financial crisis, which erupted eight years ago. In its aftermath, policy rates have effectively reached the zero lower bound², so central banks have resorted to using other tools (such as quantitative easing and negative deposit rates) to try to reach their goals.

1. See for instance Clarida, Richard; Gali, Jordi; Gertler, Mark (2000). "Monetary Policy Rules and Macroeconomic Stability: Theory and Some Evidence". *Quarterly Journal of Economics* 115 (1): 147–180. Note however that the BIS (2016) recently made a plea for an augmented Taylor rule, incorporating financial factors as well. They conclude that the inclusion of financial factors warrants a higher neutral real rate than secular stagnation proponents suggest.

2. Note that the zero lower bound is somewhat below zero as one accounts for storage and transportation costs of physical currency, as Cœuré (2015) mentioned. Central banks are experimenting with negative deposit rates for banks depositing money at the central bank. The ECB deposit rate is now -40 bps.

Figure 2.21: Taylor rule and expected policy rate path ECB base case scenario (in %)



Source: Thomson Reuters Datastream, Robeco

The graph shows our projections for the Eurozone cash rate, following our Taylor rule projections. It is clear that the shift towards a more conventional interest rate policy will not come overnight, but will occur very gradually in the next few years. Consistent with the right skewed inflation distribution that has been the case in the past, the ECB will likely err on the side of caution and let inflation run up rather than derailing any recovery with a preemptive strike. It also has to address how to unwind unconventional policies to pave the way for rate hikes. Having witnessed the ‘taper tantrum’ Bernanke caused in 2013, the ECB will tread carefully and it will be well into 2018 before they start tapering bond purchases. The Taylor rule confirms the ECB’s forward guidance of not intending to raise the policy rate “for an extended period of time”. The first rate hike we expect will come in 2019 and will be just 25 bps, but once inflation returns to target and full employment approaches, we expect more decisive hikes in subsequent years. We envisage the average nominal return on cash to be 0.75% for a Eurozone based investor for the next five years.

2.3.2 Government bonds

The global bond market generated strong returns last year as yields continued their downward trend, venturing further into negative territory. The Eurozone yield curve has shown a further downward shift and has flattened too. This flattening has partly been induced by the ECB through its forward guidance, reaffirming expectations for ongoing low short-term interest rates, and its QE purchases at the longer end of the curve which are compressing the term premium. As discussed in our valuation chapter, we find the Eurozone sovereign bond market overvalued considering its non-alignment with its fair value proxied by short term rates, current inflation and economic activity indicators. Looking ahead, we have outlined in our cash outlook the arguments why the ECB will gradually shift its forward guidance towards a more hawkish stance. Having said that, it is pretty clear to us that the search for safe havens is not likely to disappear overnight. Although negative yielding government bonds can hardly be considered safe havens, their traditional appeal will linger as Brexit and concerns about European cohesion are likely to stay with us for the time being.

Declining issuance volumes and the relative lack of elasticity in bond demand (partly institutional, but also central bank) have reinforced the strength of the current rally. At this point in time it is obvious that ECB demand is inelastic as a result of its efforts to reach its inflation target by buying EUR 80 billion of bonds each month at least until March 2017. As we already have shown in our valuation chapter, since the ECB started unconventional monetary policy, the bond market has increasingly deviated from fundamentals.

Three reasons why buying pressure should dissipate

Looking ahead, we expect macro developments to alleviate this ‘technical’ buying pressure for three reasons. First, we expect the ECB to start tapering around 2018, when it will disappear from the scene as a major buyer. Second, we think fiscal stimulus will set in and government bond supply will increase as well. Third, judging from the diminishing sensitivity of bond yields to additional QE (see valuation part), it will probably be increasingly difficult for the ECB to dictate bond prices.

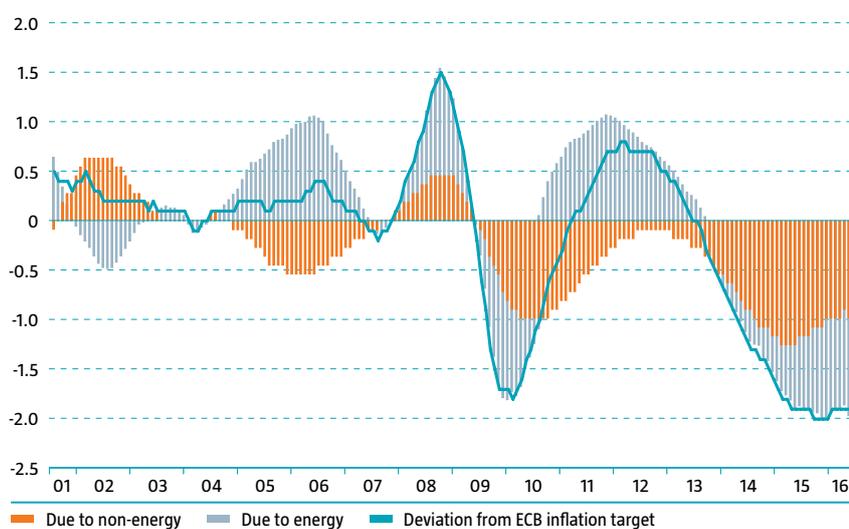
Macro factors come to the fore

This tendency for higher bond yields is expected to broaden as macro factors like a shrinking output gap and ebbing deflationary pressure start to be discounted by the bond market. We expect this to happen around 2018-2019, leading to a temporary steepening of the curve as the long end is repriced. As the ECB will probably react later in 2019 by starting a tightening cycle, Eurozone yield curves will flatten again as short-term rates catch up.

One aspect underpinning our view of a shrinking output gap is that governments will step in and increase expenditure. But the European consumer is also likely to contribute more in the later phase of our five-year outlook as labor markets tighten further and real household income growth starts to pick-up more significantly. As both governments and the private sector start to show a higher propensity to spend, the savings glut will stabilize, followed by a bottoming out of capital demand that will eventually push up longer-term yields.

We expect deflationary pressures to ebb. Roughly half of the current deviation of inflation from the ECB target of ‘below, but close to 2%’ can be attributed to energy (see Figure 2.22). Since 2014, oil prices have started to recover from the supply glut and we agree with the IEA that this process is set to continue as supply from the US declines and oil demand starts to pick up, partly helped by increased emerging market demand. The projections of the IEA suggest the negative y-o-y oil price effect on inflation will have completely disappeared by early 2017. Core inflation, as discussed in the cash rate section, will pick up as consumers start frontloading consumption. Eventually, the market will be forced to price out the secular stagnation bias which is currently priced into the market.

Figure 2.22: Decomposing deviations from Eurozone inflation target



Source: Thomson Reuters Datastream, Robeco

In summary, we expect the movement towards a bottoming out of bond yields to be a slow process over the next few years, with a more pronounced acceleration towards yield levels of 3.0% for 10-year Eurozone bonds in 2021. As the bulk of this increase in yields occurs at the end of our projection period, in our baseline scenario, bond returns are expected to generate geometric average annual returns of around -3.5% in the next five years for 10-year German government bonds. This return prediction is not exceptional. It is a mere mathematical reflection of negative yielding 10-year bonds with constant maturity confronted with a positive rate shock of +300 bps within a five-year window.

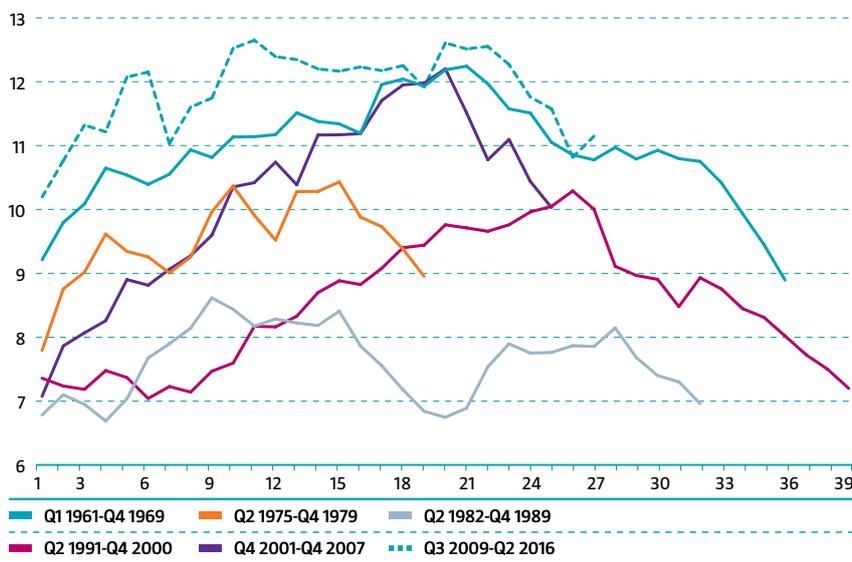
Equities

Seven and a half years ago, stocks reached their credit-crisis low point and started what is now known as the most unloved equity rally in financial market history. One frequently used expression to describe equity markets during this era was ‘climbing the wall of worry’; with equities repeatedly managing to move higher, drawing reluctant investors back in. There are numerous reasons for this, including strong corporate buybacks, ample liquidity from central banks and the search for returns in (defensive) equities as return prospects in other asset classes dwindle. On balance, we expect below historical average returns from the global stock market in the next five years.

Very low interest rates, severe costs cuts, increased corporate leverage and the rise of firms with high pricing power have all contributed to the strong increase in earnings since the financial crisis. From a global earnings perspective, our baseline scenario of strengthening GDP growth and higher inflation, is not a negative one. Real global economic growth is projected to reach around 3% with inflation increasing to a peak level of 2.9% by the end of the five-year period. In such an inflation scenario, since 1900, equity markets in 21 countries have generated average real returns of an above average 4.7%. If we add our own inflation expectations, a simple approach would result in a 7.5% nominal annual return in the next five years in our baseline scenario. However, we take a more cautious stance than the equity-return estimates given by the unconditional macro view, and expect a somewhat lower return of 6.5%, taking specific factors into account.

First, profit margins in the US have already declined but still look stretched from a historical perspective, with the corporate profit share of US GDP now at 10.6% compared to the historical median of 9.5%. As we expect wage growth to pick up, unit labor costs in the US (which constitute 59% of the MSCI World Index) will rise as well. In an expansion phase, wage growth eventually outpaces productivity, lowering corporate profitability. Also, some rebalancing in terms of the share that profits and wages make up in GDP is likely, although this will be a slow and moderate process. The US could regain some of its lost external pricing power as we expect the dollar (which is still 20% overvalued on a PPP basis) to depreciate in the next five years (around 30% of US corporate earnings are generated overseas). It should be noted however that the margin outlook is more benign if we look at the other regions. In Europe for example, the labor market still has a fair degree of slack, while profit margins have remained subdued and still have upside with the current low corporate lending rates.

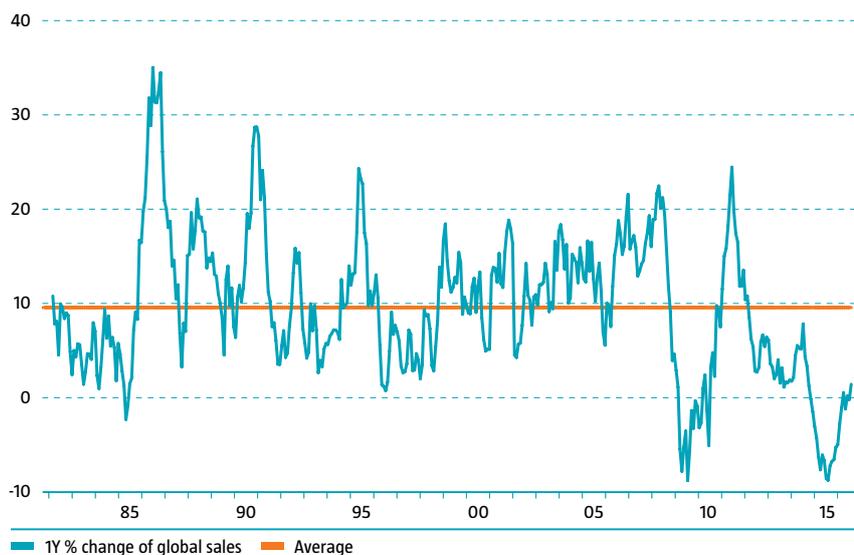
Figure 2.23: US corporate profit margin (as % of US GDP) paths during NBER expansion phases



Source: Thomson Reuters Datastream, Robeco

Second, sales growth has experienced a slump recently, with some commentators like the Economist, even regarding this as evidence of secular stagnation. US consumption growth has remained significantly below the average consumption path during NBER expansion phases and should revert to its average path if (as we expect) the recovery continues. This subdued consumption path is partly the result of the drawn out deleveraging in the private sector since the financial crisis.

Figure 2.24: Global sales growth



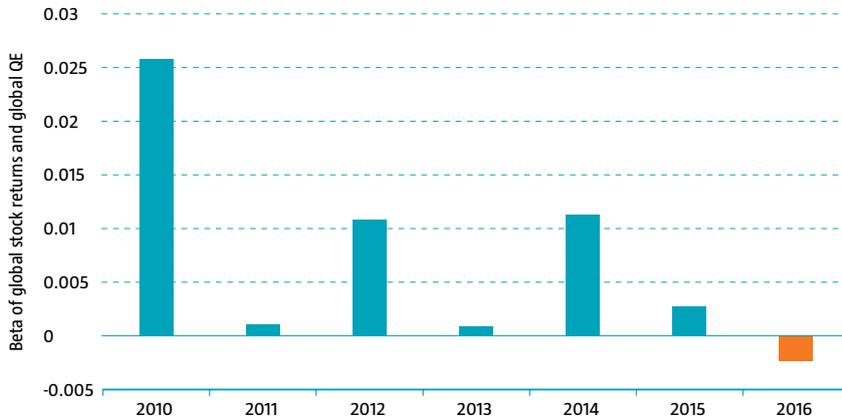
Source: Thomson Reuters Datastream

Third, global corporate leverage has increased in response to the very easy monetary policy and funds raised have been partly used to finance share buybacks. These buybacks have been responsible to a large extent for the multiple expansion seen in recent years. As the projected rise in interest rates will make financing buybacks more expensive, this additional boost to returns will diminish. We also expect firms to increase capex spending as corporate growth opportunities brighten and replacement investment is required as the average age of US capital stock has increased steadily in recent decades.

Fourth, both the extent and effectiveness of central bank easy money policy is expected to decline, making the multiple expansion of recent years less likely. After seven years of global quantitative easing (QE), it is doubtful how effective cheap money really is as a tool to boost aggregate demand (and thereby corporate earnings growth).

The first signs of diminishing returns from additional QE are evident if we examine the one-year rolling beta of quarterly rolling MSCI World stock returns and the quarterly change in the cumulative balance sheets of the ECB, Fed and the Bank of Japan (BoJ). After six years of positive sensitivity to additional QE, the stock market beta with respect to QE has turned negative this year.

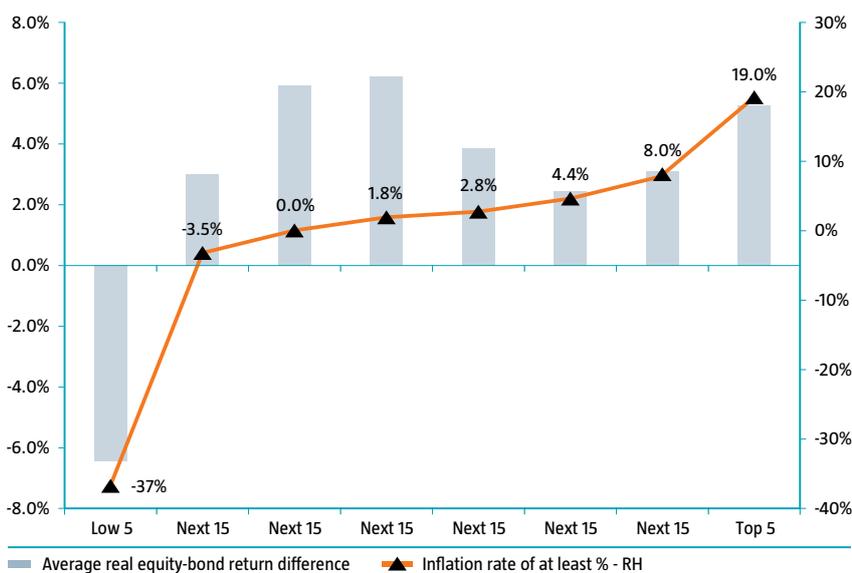
Figure 2.25: Diminishing sensitivity to QE



Source: Thomson Reuters Datastream, Robeco

Now the effects of the QE medicine are wearing off, market sentiment will focus more on fundamentals for equity returns, creating higher stock market volatility. On balance, we attach a neutral macro tilt. Adding this macro tilt to our more constructive view on stock valuations levels, we expect to see a geometric annual return of 6.5%. As valuations have improved compared to last year, we have raised our return forecast for developed market equities by 1% from our previous outlook. From a relative perspective, equities have more to offer than sovereign bonds, especially as bond markets will be challenged more by the return of inflation. As equities are a better inflation hedge (see Figure 2.26), equities will remain attractive in the next five years.

Figure 2.26: Real equity versus bond returns in different inflation regimes since 1900



Source: Dimson-Marsh-Staunton database (2015), Robeco

2.3.3 Investment grade and high yield

If we currently had to characterize the overall sentiment among corporate bond investors, it would be one of pessimism, whether they are cautious or not. Many fear we are entering a bear phase in the credit cycle after a relatively long expansion phase. Companies have found it easy to raise capital in the debt market, helped by the ultra-low interest rates and government bond yields, and the ample liquidity which has induced the ‘search for yield’ environment. Leverage has increased and credit quality has decreased: so the general consensus seems to be that it is just a question of time before the debt cycle turns negative. Although we acknowledge the underlying trend of eroding credit quality, we do not share the concerns that this is bound to end in an adverse credit cycle. For one, developments in the energy sector have pushed yields and defaults in the US high yield markets higher for more than a year now, which has made investors aware of the underlying risks. As a result, there are no exuberant expectations, no buying frenzy. The fear that a bubble is about to pop, is not correct in our view. What’s more, low rates are not necessarily only negative: they have a positive side too. The low interest rate environment is the reason why debt servicing has remained high and defaults so far remained at remarkably low levels. Assuming that firms are able to match GDP growth in their earnings, the gap between GDP and real interest rates creates a nice buffer for debt servicing.

This does not mean that we are bullish on the corporate bond markets: the goldilocks scenario we have seen over the past five years is not going to be repeated. The frequency of investment grade defaults will increase (although from a low level) and we expect spreads to widen as the interest rate normalization takes hold. On balance, we expect global investment grade credits to yield an excess return of 75 basis point over the underlying blended benchmark (60/40 US/EU), well below the current spread of 130 basis points. We are more optimistic on high yield, where we expect an excess return of 225 basis points over the blended benchmark (80/20 US/EU). We will take a more detailed look at these returns below, by looking at the two main elements that drive returns: spreads and defaults.

Spreads are expected to widen

The prominent market fear is that the current benign interest rate and ample liquidity scenario has led to capital misallocation. Following the financial crisis, firms deleveraged and cut back on shareholder payments. As the echoes of the crisis fade, we see that the focus on the shareholder has come back. For example, Figure 2.27 shows the ratio between share buybacks and dividend payments versus EBITDA for the Russell 1000 Index. Clearly, a larger share of the earnings has been finding its way to the shareholder lately.

Figure 2.27: Share buyback + dividend as a ratio of EBITDA for Russell 1000 companies



Source: Bloomberg

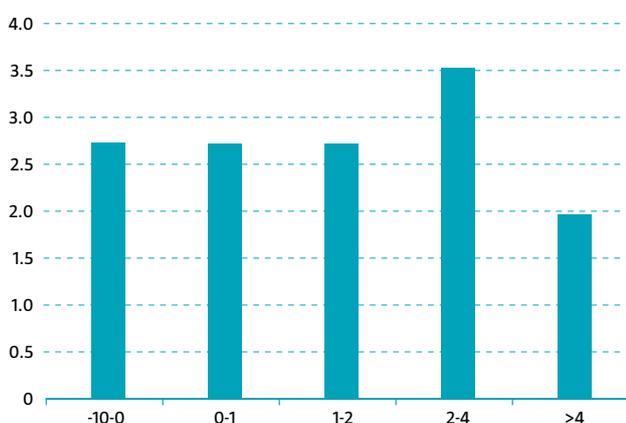
As shareholders are receiving a larger share of the earnings, the question is who has to give in? The answer is the same from both a direct and indirect perspective: the bondholder. The direct impact can clearly be seen in Figure 4 of the debt special, which shows how increased bond issuance is directly linked to dividend and share buybacks. Even if this is not financed by running up more debt, the cash outlay still has a negative impact on the underlying credit profile.

In our baseline scenario we expect the expansion phase to continue and firms to retain a shareholder-friendly attitude. Firms are likely to want to maintain a healthy payout to shareholders if a further uptick is to be expected. We think there are two possible ways of financing this payout. Either the pace of earnings growth will increase, or firms will draw down further on their cash reserves or issue new debt. In the US, we expect the emphasis to be on the latter, as we expect margins there to come under pressure. For other markets the picture looks more benign as there is still room for stronger earnings growth. The overall picture is one of slowly deteriorating fundamentals (i.e. more leverage) which is typical for an expansion phase. We expect central banks to end their QE support, which we believe will cause credit spreads to normalize to historically observed levels. We expect spreads in the global high yield market to remain above 470 (the median level since 1994) and forecast an average spread of 500. We expect global credit spreads to rise from the current level of 130 bps to 150 bps, which is above the historical average.

What to expect in terms of defaults?

The nature of the high yield market means that defaults play a much more prominent role in determining overall returns than they do for credits. As the US dominates this part of the corporate bond market, we restrict our analyses to US defaults. Given that we expect growth to pick up, a fair starting point for default rates is the average 3.2% seen during US expansion phases. This is somewhat too optimistic though. For one, we expect inflation to pick up and rise to 3% at the end of the period. Historically, the average default rate in an environment of moderate inflation (2%-4%) has been 3.5%. Based on the underlying deterioration in credit quality and the rise in the underlying government bond yield curve, we prefer to be somewhat more cautious and forecast an average default rate of 3.8%. If we take a conservative recovery rate of 30%, and assume high yield spreads will converge to 500 bps, this leaves us with an excess return of 2.25% over sovereign bonds in the next five years.

Figure 2.28: Inflation regimes versus speculative grade defaults

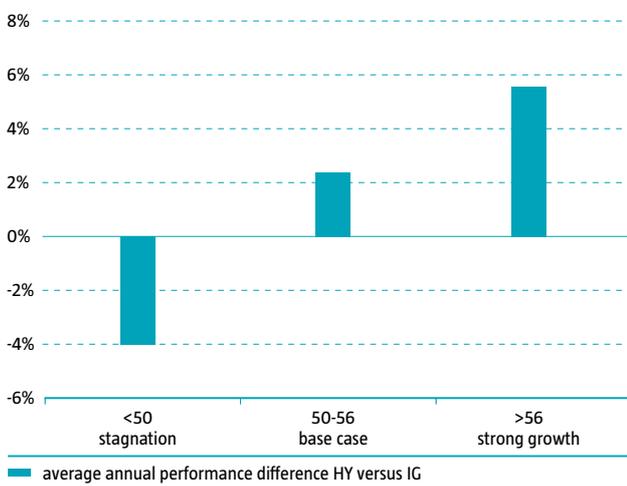


Source: Moody's, Bank of America Merrill Lynch, Robeco, Dimson-Marsh-Staunton database (2014)

Credits have less to offer

For investment grade (IG) credits, we expect only 75 bps of excess return compared to sovereign bonds in the next five years. This is clearly below the returns we have seen over the past five years for the Eurozone. There are two reasons why IG is expected to underperform high yield. The first is that the buffer for IG is a lot lower, leaving the asset class relatively sensitive to movements in spreads and yields. However, the policy change we expect from the European central bank is more important: European spreads are currently below average levels, due to the QE programs that also include corporate bonds. As we expect the ECB (and Bank of England) to start tapering from 2018 onward, spreads are forecast to also rise to historical median levels of 130 bps. We expect spreads in the US to overshoot this median level, as we believe earnings growth will not be enough to compensate for the shareholder friendly attitude typically seen in an expansion phase.

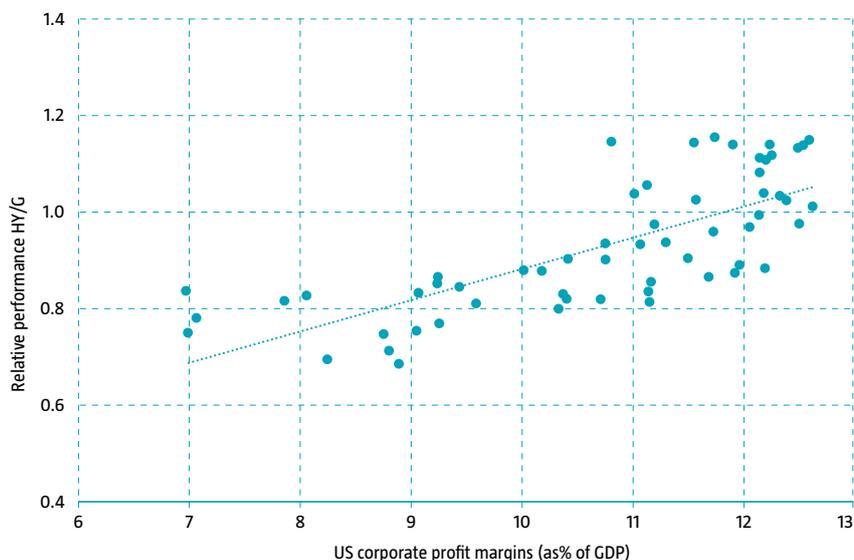
Figure 2.29: Performance HY versus IG in various economic cycles
(as proxied by ISM: <50 contraction, >50 expansion)



Source: Thomson Reuters Datastream, Robeco

Historical data also supports the underperformance of credit versus high yield we predict in our baseline scenario. Our GDP growth rate estimate of 3% corresponds with the leading producer confidence index in the upper bandwidth of the 50-56 bracket. This bracket corresponds with a 2% return difference in favor of high yield and confirms the direction of the excess return differential we established earlier. It should also be noted, however, that, despite this positive excess return, historically volatility has been higher for high yield bonds as well. Also, a steeper than expected drop in (US) profit margins will benefit investment grade performance relative to high yield.

Figure 2.30: US profit margins and relative performance high yield versus investment grade bonds



Source: Thomson Reuters Datastream, Robeco

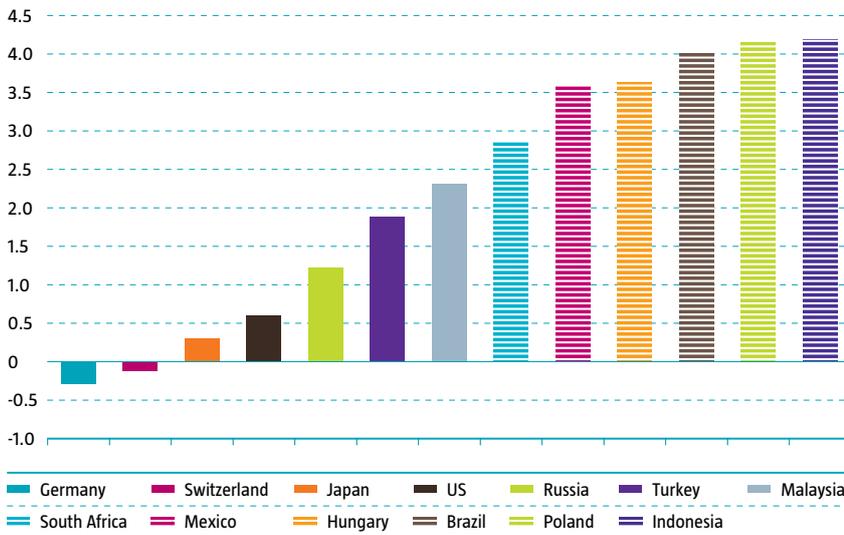
To derive a return estimate for global IG and high yield we add the excess return to a blended US/EU government benchmark. As the maturity profile of credits and especially high yield are typically shorter than the 10 years we use for our government bond returns, we also take maturity differences into account. Using these settings, we end up with a total return (hedged to euro) for global IG of around -1.25% and for global high yield of 1%.

2.3.4 Emerging market debt outlook: headwinds become tailwinds

Last year, we listed five headwinds for emerging market debt (EMD): a strong dollar, subdued global trade, weak political institutions and reforms, declining commodity prices and slowing US economic activity. The dollar rally has slowed because the Fed remained on hold for longer than the market initially expected, the oil market has shown signs of rebalancing and US manufacturing activity has improved following extreme weakness in the US energy sector. But geopolitical risk remains a threat (evidenced by the recent failed coup in Turkey) and global trade activity is significantly below trend.

Within our baseline scenario, we think some of these former headwinds could become tailwinds in the next five years and investors with a horizon of five years or longer should join the current positive sentiment shift towards EMD, despite the fact that return volatility will remain high. While real yields in developed markets are being increasingly compressed into negative territory, the positive real yields in emerging markets look attractive.

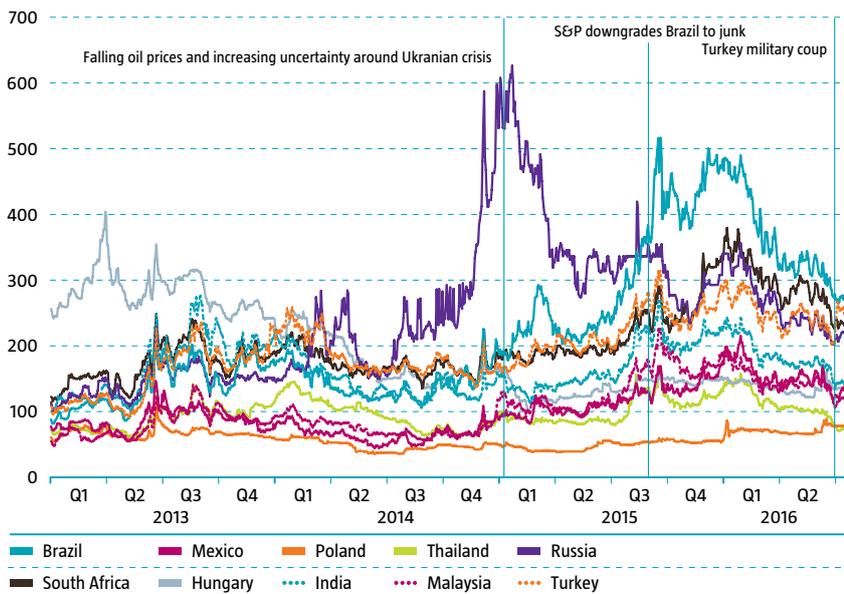
Figure 2.31: Real 10Y bond yields (CPI based)



Source: Thomson Reuters Datastream, Robeco

However, what matters is whether investors are really able to fully capture these high real rates. The perceived ability and the willingness of sovereigns to pay up is crucial here. Baldacci, Gupta and Mati (2008) suggest political factors determine a significant part of the emerging market debt credit spreads. As the graph shows, this is certainly a factor that has also moved EMD credit spreads in recent years and is likely to continue to do so in the next five years.

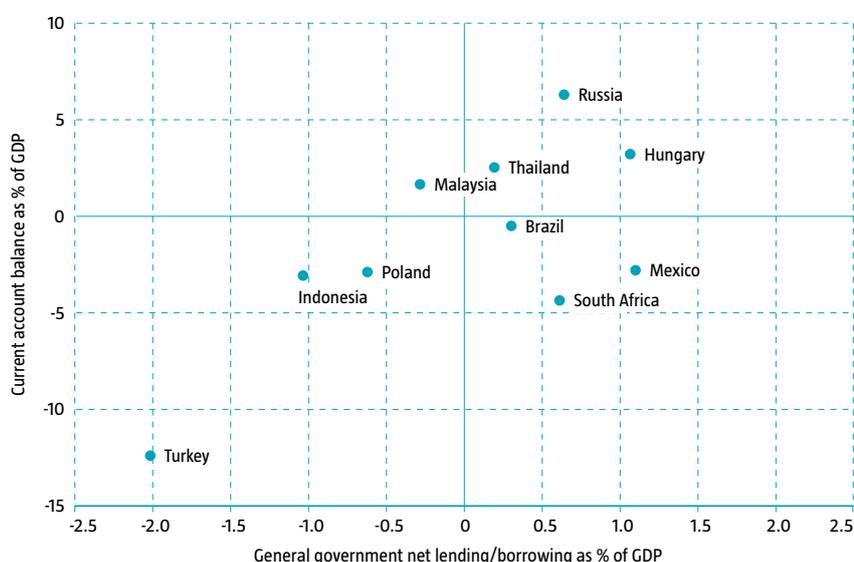
Figure 2.32: EMD issuers credit default swaps in basis points



Source: Thomson Reuters Datastream, Robeco

While the political landscape will remain a significant risk factor affecting the potential willingness to pay, we think the improving ability to pay will compensate for this in the next five years. The graph below shows IMF projections for the average primary budget balance and current account in the next five years, both as percentages of GDP. As an investor, one would typically like to see both an improvement in the internal and external ability to pay debt in the next five years, with all EMD issuers showing up in the right hand upper quadrant. Although not all EMD issuers have this potential, the overall picture suggests that EMD issuing economies are heading in the right direction. Only Turkey and to a lesser extent Indonesia and Poland are lagging with forecast current account deficits.

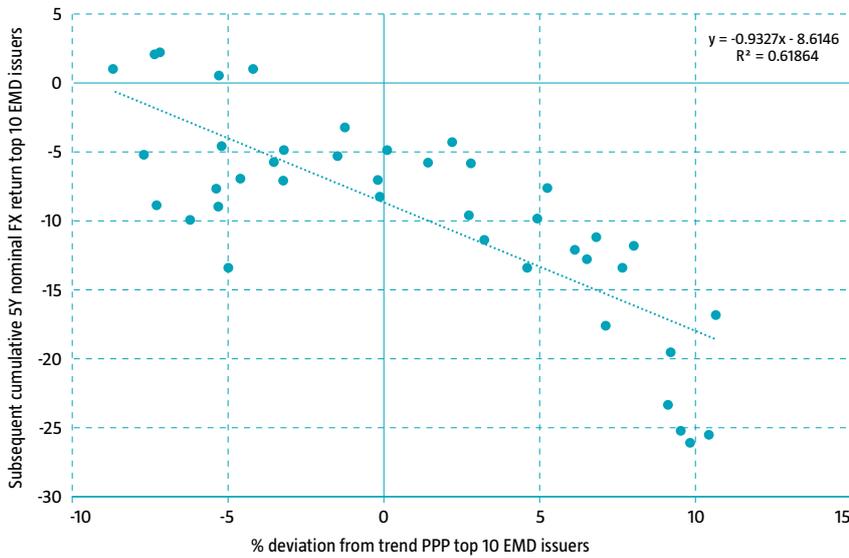
Figure 2.33: Ability to pay – internal versus external balance, 5Y averages of 2017-2021 IMF projections



Source: Thomson Reuters Datastream, IMF, Robeco

From an internal balance perspective, economic growth in emerging markets will remain high enough to cushion disappointments resulting from budget policies, leaving debt sustainability intact. This also offers emerging markets the option of using fiscal policy to stimulate economies if necessary. The actual average debt level for EMD issuing countries is now 48% of GDP, far below that of developed countries. From an external balance perspective, we are becoming outright optimistic as emerging market currencies have depreciated enough to restore the external balance in our view, now trading around 9% below fair value on a PPP-based valuation metric. Research shows that deviations from fair value mean revert over a five-year horizon. Even when we take a conservative view, given the intrinsic volatility risk (think of the Russian ruble crisis, for example), a 1% annual FX appreciation for the next five years is not unreasonable.

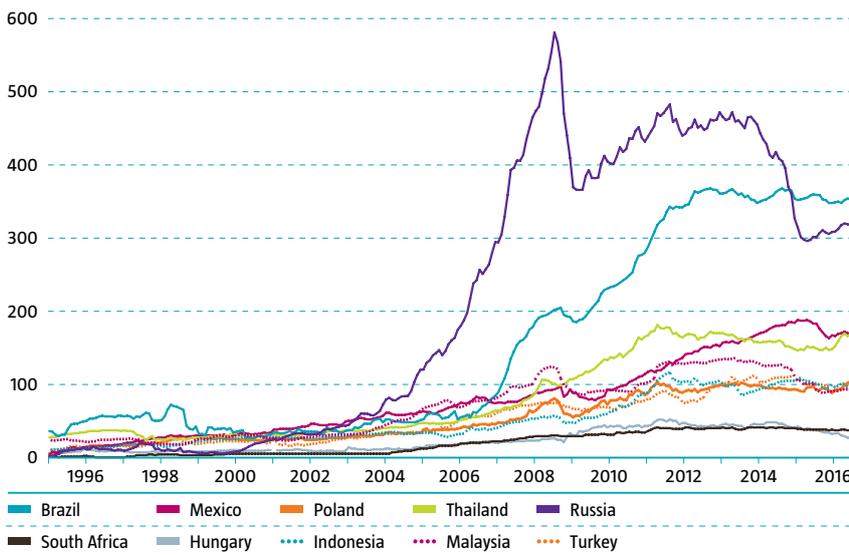
Figure 2.34: Deviation from fair value emerging debt currencies and subsequent 5Y returns from 2001-2011



Source: Thomson Reuters Datastream, Robeco

Improved external competitiveness resulting from the cheap currencies will improve productivity growth and current accounts, improving EMD issuers' ability to pay their sovereign debt. Stronger currencies will also lower inflationary pressures, giving central banks room to cut rates, as Russia has already shown. Also, the power of EM central banks to intervene has been strengthened over the past decade as demonstrated by the steady buildup in FX reserves.

Figure 2.35: FX reserves of top 10 EMD Local currency



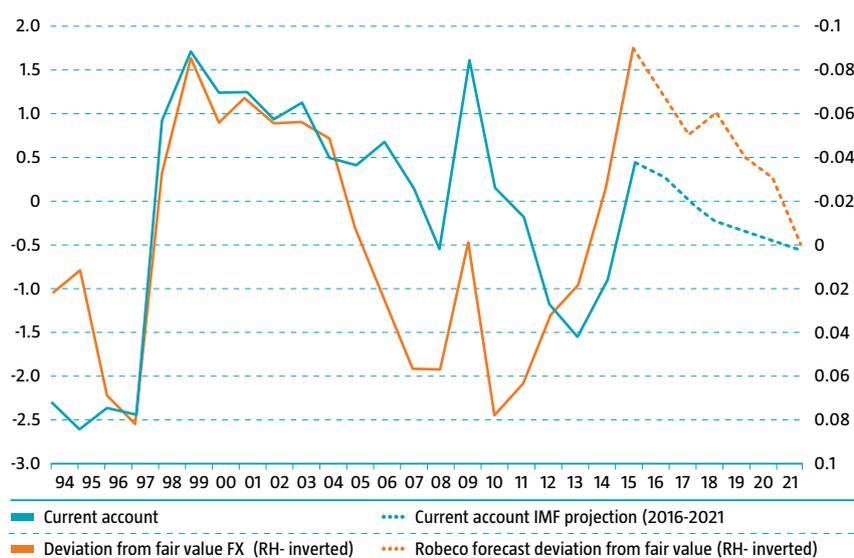
Source: Thomson Reuters Datastream, IMF

The IMF expects the average current account of EMD issuers to remain in deficit as a percentage of GDP over the next five years. We are more optimistic than the IMF on this and expect to see a moderate overall current account surplus. Vital elements for this are that oil prices remain in the USD 40-USD 70 bracket, higher US growth expectations and more upside from improving terms of trade. But at the same time we see sources of volatility in the next five years that investors should be aware of.

First, currencies could experience new bouts of volatility as the Fed starts to tighten more decisively, something we expect to happen in the second part of our five-year outlook period. Monetary tightening in developed markets will impact emerging countries despite sometimes out of sync inflation-output cycles. Second, a shift towards consumption growth in China, which we expect in our baseline scenario, would also result in lower (commodity-related) import demand and thus lower export volumes from other emerging markets to China, preventing a decent rise in current accounts. An additional risk here is a sudden devaluation of the yuan, which would push other emerging economies into a round of competitive devaluation. Third, we expect continuing divergence within emerging market external balances according to differences in their export orientation, fiscal and monetary policies and political stability.

With a coupon of 6%, and an expected currency appreciation of 1% per annum, return prospects in euro terms are appealing. However, returns will be accompanied by considerable volatility and, taking the overall expected rate rise in global bond markets into account, we expect a more moderate annualized return of 5.5% in euro terms. This translates into an excess return of 9% over Eurozone government bonds. This is significantly higher than the result we would expect in the steady state outcome, which is a reflection of the exceptional valuation differential compared to developed market government bonds and the more benign macroeconomic environment.

Figure 2.36: Evolution of current account versus EMD currency valuation

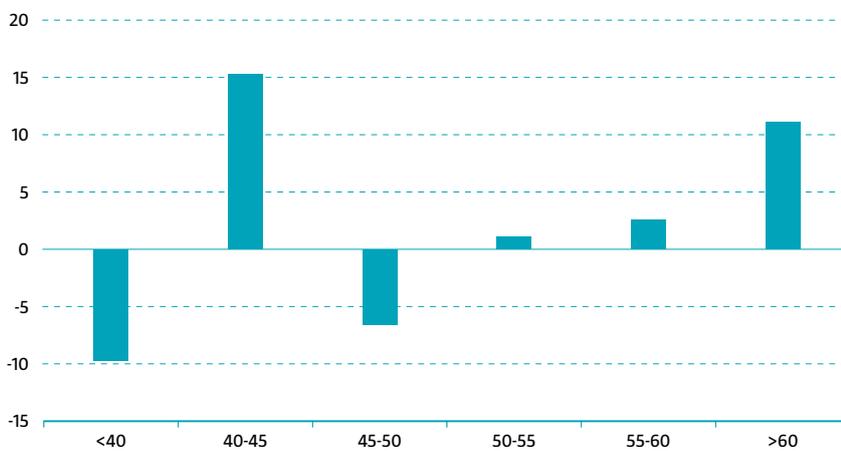


Source: Thomson Reuters Datastream, IMF, BIS, Robeco

2.3.5 Real estate likely to give up some ground to equities

Over the past five years, we have seen real estate strongly outperform equities which begs the question whether this will continue in the next five years. We think real estate will fall somewhat behind global equity performance for two reasons. First, real estate generally performs best compared to equity in an environment of either very strong economic expansion or one in which recession risk is increasing, as the bar chart below shows. In our baseline scenario we do not think ISM producer confidence numbers are likely to drop below 45 or to surge above 60. We think that the return of US growth to 2.8% probably corresponds more with an ISM of between 50 and 55, which only suggests very modest upside for real estate in the remainder of this expansion phase.

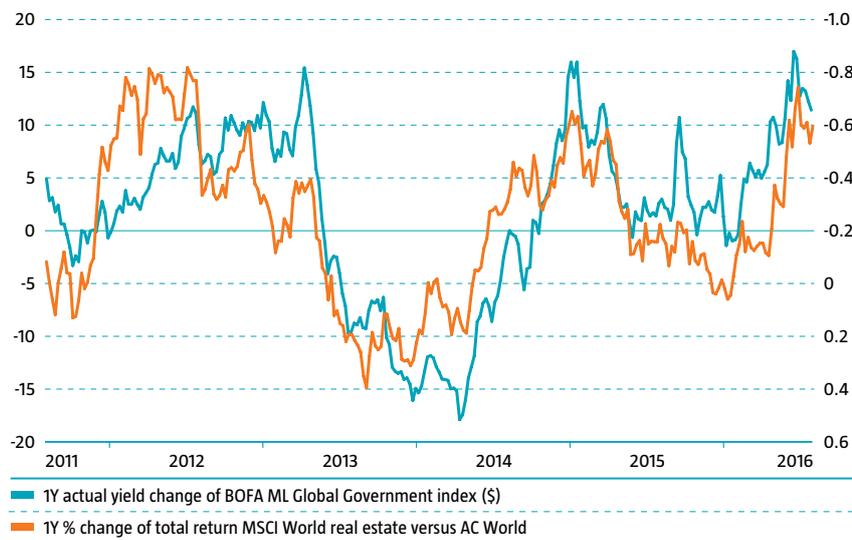
Figure 2.37: Relative performance real estate compared to global equities during different phases of US economic cycle



Source: Thomson Reuters Datastream, Robeco

Second, real estate is likely to struggle towards the end of our projection period as the Fed starts to hike more aggressively to tame inflation. In past years, real estate’s relative performance has moved inversely to nominal global bond yields (see Figure 2.38). As we expect global bond yields to rise more than 2% in the course of the next five years, real estate will likely give some up ground to global equities.

Figure 2.38: Relative performance real estate versus equities and global bond yields (in %)



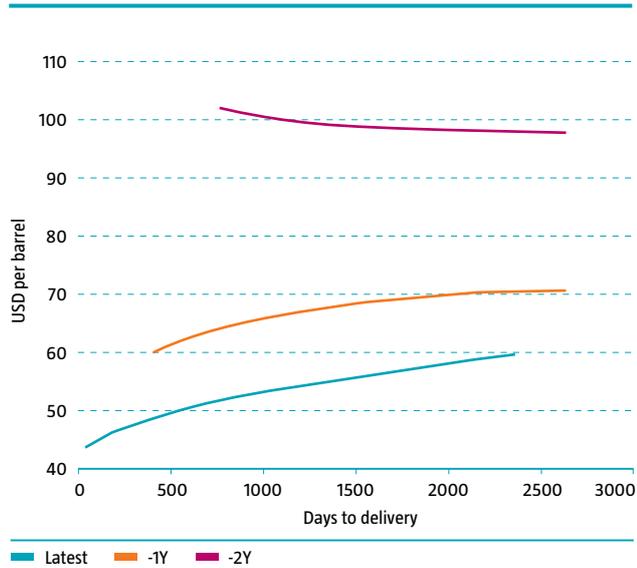
Source: Thomson Reuters Datastream, Robeco

That is not to say our baseline scenario is negative for real estate, as the asset class offers some protection against inflation, something we expect to return. Real estate will also retain its appeal in any surprise episodes of negative growth, which may encourage a flight to conservative equities and bond proxies like real estate. Global rent levels will also pick up as labor markets in developed markets tighten and rising labor mobility sustains house prices.

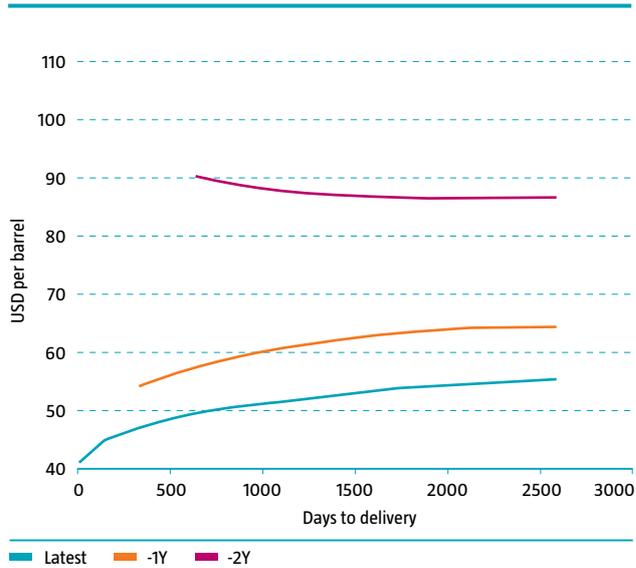
2.3.6 Commodities

Three factors drive commodity returns; the risk-free rate, the spot return and the roll return. The academic literature points out just how important roll returns are for commodities, but as we said in our previous edition of Expected Returns, it is nearly impossible to determine in advance what future roll returns will be. For example, few analysts anticipated the rapidly shrinking contango in the oil curve this spring. For our return estimates we focus on the spot return. We expect commodity markets to enter an exploitation phase once the supply glut caused by heavy investment has been fully unwound. Capex spending in resources has slumped. This environment could be positive for spot returns, as the continued expansion in the manufacturing sector in our baseline scenario will boost demand for commodities. However, given the remaining supply glut, very high US oil inventories, the flexible cost structure of US oil producers and the shift in economic structure taking place in China in the medium term, there are still powerful countervailing forces at work. For oil, we estimate a price between USD 40 and USD 70. This is somewhat above the market expectations priced into oil futures curves, but our baseline scenario expects stronger oil demand due to above consensus growth in major oil consumers like US and India. Also, we think the current market is overestimating the global impact of future US oil supply, which will become less price sensitive when the leveraged US energy sector starts to face rising borrowing costs when refinancing.

Figure 2.39: Crude oil futures curves: ICE Brent (LLC)



Crude oil futures curves: Nymex (NCL)



Source: Thomson Reuters Datastream, Robeco

We expect a return of 2.75% for commodities in the next five years. This might seem low compared to the expected spot return one would achieve if the oil price were to be USD 70 p/b in 2021 (up from the current price of around USD 40), but we should be aware that the futures curve is already discounting prices of around USD 55 in 2021, limiting the potential return upside.

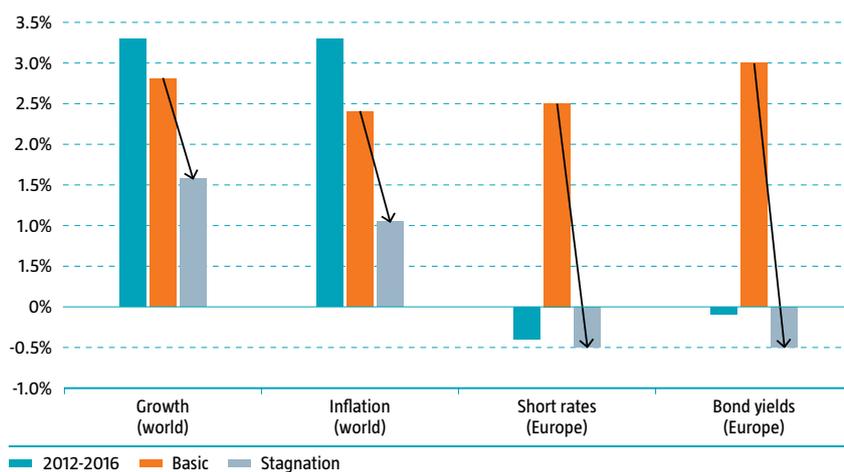
2.4 Stagnation scenario (30%)

This year it is hard to escape the feeling that it has never been easier to come up with a credible downturn scenario. Pessimism on potential economic growth is pretty widespread and this can easily become self-fulfilling: uncertainty puts a drag on consumer spending and investment, lowering growth and feeding the pessimism further. The fact that monetary policy seems to have lost the ability to move the needle with respect to growth and inflation adds to the uncertainty, while there are serious concerns that the shift to negative rates might actually have a counterproductive effect. It has been four years since Robert Gordon identified six headwinds that would drag growth lower and so far the low-growth statistics are on his side. Reduced labor force participation, inequality, debt, the environment and flattening out of educational achievement are certainly factors that play a role and could – as Gordon predicted – be here to stay. Add to this a China debt meltdown scenario, the negative consequences of the return of protectionism, or a further unraveling of the European economic union and it is clear that we are spoilt for choice, when it comes to negative outlooks.

At the same time, we should not let ourselves get carried away. If we exclude an extreme episode like that of 2008-2009, even the Japanese economy – one that has been struggling to escape from deflation for over 25 years – has seldom experienced a period of five years with no net growth. What is exceptional for one country, is close to unheard of for the world economy as a whole: weakness in one region is normally compensated by strong growth elsewhere. As such, even in an adverse scenario, we do not think it is very realistic to forecast an economic depression, but rather a continued decline in global economic growth. On average, we expect this growth to decline to 1.6%, half the level seen over the past five years. Parts of the world economy will be hit by recession, China will hit

zero growth, from which a subdued recovery will take place, which should on balance be sufficient to keep its average growth in positive territory. Inflation will drop to an average of 1%, but will reach deflationary average levels without the contribution of the emerging markets. The Western world will sink into a Japan-like scenario, with aggregate price levels remaining unchanged for prolonged periods.

Figure 2.40: Stagnation – growth and inflation will become scarce commodities



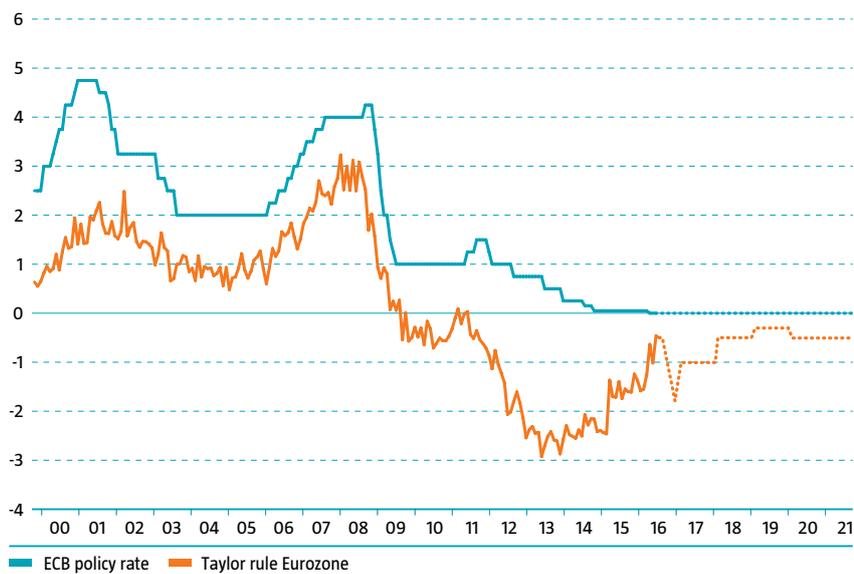
Source: Robeco

Not surprisingly, this is not a very positive environment for the returns of the major asset classes. We go on to discuss the various broader asset classes below.

2.4.1 Cash

Declining growth, zero if not negative inflation: it is clear that central banks will retain their bias to keep short-term rates low in this scenario. This can be easily shown by plotting our expectations for inflation and unemployment in our Taylor rule framework, which depicts the so-called ‘equilibrium’ rate central banks aim for. For the Eurozone, the Taylor rule remains negative for the whole timeframe, and is in fact (far) below the current deposit rate of -0.4%. Despite this gap, we expect the ECB to put more emphasis on QE measures rather than to aggressively lower interest rates further. Lower rates come at a cost: there are negative consequences for bank profits and it causes a loss of control over physical cash. These are the reasons why we do not expect further aggressive rate cuts, but we do expect the returns on cash to decline across the globe. So far, most commercial banks have shied away from introducing negative rates for their clients, but as time progresses, we expect negative deposit rates to feed through to the whole spectrum of investors: negative will become the standard reality. The US may be the exception in the developed world – the only place where short-term rates may just stay above zero, but the margin will be slim. From the perspective of a European institutional investor, nominal and even real returns on cash will on average be negative for the whole period.

Figure 2.41: Taylor rule projection



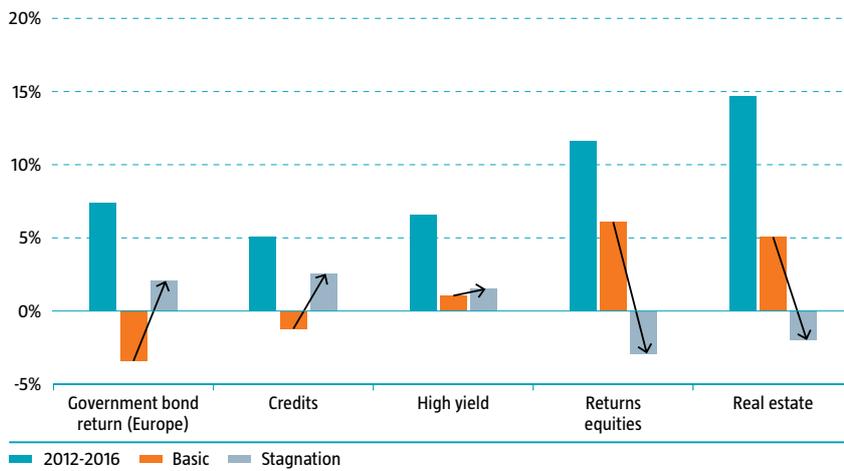
Source: Thomson Reuters Datastream, Robeco

2.4.2 Government bonds

Historically, the best returns in the bond market are booked in periods of disinflation or deflation, so in itself the stagnation environment is not necessarily negative from a bond investor’s perspective. There is one factor that can potentially spoil the bond party however: defaults. Declining growth can have a negative impact on the financial position of governments, as tax income declines, while unemployment-related spending rises. More often than not, governments have stepped in as the spender of last resort during recessions even though this causes their financial position to deteriorate. In the absence of a credible central bank with ample reserves, in the past this has led to defaults, which has a negative impact on returns. Although this could still happen in the case of smaller – fragile – emerging markets, it is difficult to see this happening for the bigger developed economies or even the weaker Eurozone economies. As we have seen in recent years, central banks have stepped in as major buyers of bonds, reducing the risk of a classic default scenario. A classic default scenario typically leads to an increase in yields and pushing government debt servicing to unsustainable levels. If the Japanese government can lend at a negative rate despite a 230% debt-to-GDP ratio, it is difficult to see how the Eurozone (with an average debt of 93% of GDP) will get into trouble. As long as the ECB is willing to do whatever it takes, it is unlikely we will see classic defaults in the Eurozone.

Given that we do not think defaults will play an important role, what is the return that investors can expect in this scenario? As indicated we expect central banks to remain accommodative throughout the whole period in this scenario, trying to kick-start the economy with negative deposit rates and ongoing QE programs. In this scenario, we expect bond curves to flatten across the globe. For the European bond markets, we expect the yield curve at the end of the five-year period to be completely flat at the level of the deposit rate (-0.5%). In this scenario, average returns are expected to be around 1.5% for European bonds (German 10-year Bunds) and 2.0% for US 10-year Treasuries (hedged).

Figure 2.42: Stagnation – bonds are the only option



Source: Robeco

2.4.3 Equities

Looking at the past five years, one could be tempted to conclude that equities are not a bad place to be, even if growth is disappointing. That would be a wrong conclusion though. For one, the stagnation scenario is clearly a lot more bearish than what we have experienced in recent years: we forecast global economic growth to be half of what we have seen over the past five years, while there will be virtually no inflation. This low nominal growth will cause the debt burden of consumers, governments and corporates to remain stubbornly high, with real spending cuts the only means of bringing them under control. Added to this is the fact that corporate balance sheets have deteriorated in recent years, a factor which is bound to come back and have a negative impact on the markets. Defaults are set to rise, which will not only affect the individual companies involved, but will also lead to investors requiring a higher risk premium to hold stocks.

Neither should we forget that the respectable performance of worldwide stocks has clearly been boosted by the performance of the world’s heavyweight market, the US. A fair part of this solid performance is linked to a multiple expansion. Taking the Shiller PE as a proxy, US stocks traded at a PE of 20x back in 2011, while we are currently at a level of 26x. Given the higher level of risk awareness in this stagnation scenario, we expect this overvaluation to be priced out of the market. Although this does not apply to the European and Asian stock markets, the overall weight of US stocks and the leading character of the US market mean this will clearly drag down results everywhere. One could argue that central banks will continue to intervene whenever stocks decline too much, but even here we question whether recent developments have offered much support for the stock market moving forward and we expect to see diminishing returns on QE. Combining the starting dividend yield of 2.6% (which you can see as the ‘coupon’ you receive by investing in equities), a world economy growing by less than 3% in nominal terms, and a rerating of US stocks, we estimate an overall negative return of 2% in this scenario.

2.4.4 Corporate bonds

Turning our attention to corporate bonds, the underlying return dynamics will deviate strongly according to the issuer’s credit profile. At the high end of the credit quality spectrum, corporate bonds look a lot like government bonds, with the Japanese and European central banks lending direct buying support. At the other, there is no such direct support, with the main help coming from the lower debt service costs which are the result

of pushing interest rates to ultra-low levels. Although this can be seen as a positive, the drawback of this policy is that absolute returns in overall bond markets are depressed compared to their historical averages. And although low interest rates help, they certainly do not shield corporates (irrespective of their credit rating) from underlying economic developments. Corporate debt has risen in recent years, leverage has increased, lowering the overall quality of outstanding debt. It is clear that in our stagnation scenario with limited nominal growth, defaults will rise, even in the higher rated credit space. In order to determine returns, we take the government bond return as a starting point, and add the excess return for the underlying credit bucket, taking into account downgrades, defaults, recovery rates and the spread movements through time.

We would like to stress, that the results presented are quite sensitive to the spread/default path chosen: the earlier and the faster spreads and defaults rise, the more favorable the five-year return outcome will be. The logic is simple: if spreads rise early in the forecast period, the investor reaps the benefits of higher coupons for longer. It should also be pointed out that even though excess returns for the three scenarios look broadly the same, the volatility of the returns will be a lot higher in our two alternative scenarios than it will for our baseline scenario.

For credits, we expect yearly default rates to rise in this scenario to an average of 50 bps, which is clearly in excess of the historical average of only 20 bps, based on data from Moody's since 1920, taking into account the current rating profile. Assuming a conservative recovery rate of 30%, this means that the cost of defaults will rise to an average of around 35 bps in this scenario. Additionally, we take into account trading costs linked to downgrades from investment grade to high yield. This will eat into returns as we expect credit quality to deteriorate, which will lead to a relatively high migration from IG to high yield. As for spreads, normally it would be logical to see spreads rise in the face of increased defaults. They probably will at times, but there is one factor that makes us think the overall spread increase could be limited: QE. Combining all these factors, we end up with an excess return of around 0.5% for both Eurozone and US credits. Without further QE this number will be negative. If we add this excess return of 0.5% to the blended US/EU government benchmark (60%/40%) taking into account the differences in maturity profile, we end up with a total return for global IG credits of around 2.5%.

For high yield we expect spreads to widen more aggressively: we do not think the central banks will start buying bonds with a rating below BBB. Based on the starting spread of around 500 bps, we forecast the spread to increase to a high of 900 bps somewhere in the middle of the five-year period, after which yields will start decline again. At the same time, we expect the cost of defaults to rise to 800 bps, again assuming a recovery rate of 30%. Over the whole period we end up with an average default cost component of around 500 bps. On balance this means that we expect a high yield excess return of around 0 bps. The one positive element here is that the reference government bond return is not the European one, but a return that is much more skewed towards the US Treasury market, which we expect to outperform Euro Treasuries in this scenario. As with credits, we add the excess return to a blended US/EU government benchmark and end up with an expected absolute return of 1.5%. Of course, given the much higher volatility, it is clear where our preferences lie in such a scenario.

We would once again like to stress that this calculation suggests an accuracy which in the real world does not apply: if spreads and defaults were to peak at the end of the five-year period, the excess negative return would be as high as 2.5%.

2.5 High growth scenario (10%)

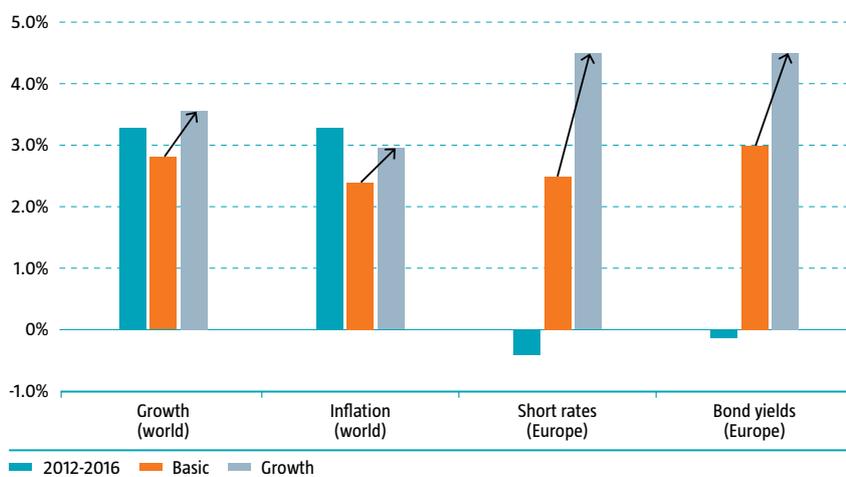
If it is so easy to come up with a stagnation scenario, does that mean that it is getting more difficult to still believe in a strong growth scenario? No, not exactly. There is a plenty of self-reinforcing momentum embedded in the way economies work, which means that a move in one direction is not easily reversed. Once growth weakens, producers and consumers become more cautious, investment, employment and consumption levels all contract, reinforcing the downward trend. The reverse also applies: once the clouds lift, people are willing to take more risk, they spend more and this leads to an improved outlook, lower unemployment rates and more growth down the line. You just need the spark to get the ball rolling.

So is there something that can act as a spark? We think there is: the consumer looks like a plausible candidate to turn the tide. For one, consumers have reduced debt over the past years, with balance sheets in the key economies like the US, Germany and even Japan improving. Unemployment rates in these countries are below their long-term averages and arguably even close to full employment. This paves the way to higher wages, boosting disposable income. Central banks also initially prefer to err on the side of caution, giving implicit preference to stronger growth and inflation, which is also helpful when it comes to reducing the real load of debt.

In this scenario, the US and the Eurozone economies expand rapidly, initially boosted by consumption, but eventually strengthened by investment too. The world economy enters a virtuous circle. Debt ratios come down. China succeeds in transforming its economy into one more driven by domestic consumption and less by investment. In the slipstream of the stronger economies, Japan accelerates as well. On average, real global economic growth will reach 3.5%. This may not sound like high growth if we compare it to the average of 3.25% seen over the past five years, but if we take aging and the lower (and more realistic) growth rate of the Chinese economy into account (average growth of 6% compared to 8.5% in 2010-2015), it means that growth will actually rise above its underlying potential.

The main risk in this scenario is the one of overheating. Often proclaimed to be a thing of the past, inflation reappears, catching many off guard. Central banks respond, but this is a delayed reaction, happy to finally escape the deflation vortex. Inflation reaches an average level of 3% for the world as a whole, with developing economies experiencing price rises in excess of what central banks consider neutral (2.5%). Central banks will eventually react, with real short-term interest rates rising into positive territory for the first time in years.

Figure 2.43: High growth and the comeback of inflation



Source: Robeco

2.5.1 Cash

Of the three scenarios, this is clearly the one that will yield the highest returns for a cash investor. As indicated, we expect central banks to eventually react to the rising inflation, pushing real short-term rates into positive territory. The US will take the lead, with inflation forecasted to peak at 3.5%. In order to get this inflation under control, the Fed will push short-term rates to a level of 5.5%. This may sound unrealistically high in the current environment, but in fact is close to the level seen in 2006 and 2007. At this level, the real cash rate (cash adjusted for inflation) will be around 2%, which puts it above the average of the pre-Great Recession period, but still well below the peak level of 4% we have seen over the last 35 years.

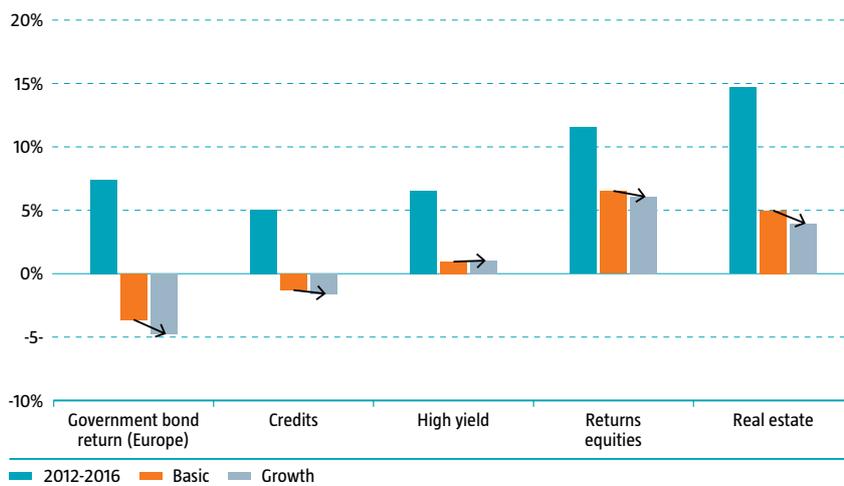
As inflation is expected to peak at lower levels in Europe (3%) short-term rates there will also be hiked less aggressively in this scenario. In the case of Europe, there is far more slack in the economy at the starting point, especially in the labor market, so inflation will start to rise later. We also expect the ECB to be somewhat more prudent with respect to inflation, in line with the historical differences observed between the US and Eurozone. Based on these observations, we expect Eurozone rates to rise to a level of 4.5%. On a five-year basis, this will result in an average return of around 2.25%.

2.5.2 Government bonds

Growth moving above trend levels and inflation acting as the comeback kid: this scenario is not going to be very supportive for the average government bond investor. Higher bond yields will ultimately mean that we are moving to a point where bonds offer value in both absolute and relative terms, but it is the transition phase before we reach that point that will be painful. Rising bond yields represent falling bond prices, which will erode returns. This is true under all circumstances, but will be more painful the lower the starting yield is, as this represents the buffer the bond investor can fall back upon. The starting yield has never been as low as this. As we have stated previously, the exact returns you will receive are path-dependent: if yields rise sharply in the earlier part of the period, it means that the coupon buffer will be bigger for the remaining part of the period. Compared to the main scenario, there will be more compensation in the form of improved coupons, but given that we expect a gradual, steady rise in yields, this scenario presents the worst of all worlds for a bond investor.

We forecast bond yields to rise steadily to 4.5% and 5.5% for Europe and the US respectively. These levels imply that by the end of the period we have a flat yield curve, indicative of a typical late cycle environment, which means that the odds of a subsequent recession are on the rise. Based on these trajectories, we end up with a -4.75% annual average return for European governments bonds and of -3.25% for US Treasuries (hedged). These numbers are grim – especially so for Europe – but it should be stressed that this is also the end of the transition period: with bond yields at the end of the period around 4.5%, subsequent returns should be much more in line with the historic long-term average of 4.5%.

Figure 2.44: High growth – not all plain sailing



Source: Robeco

2.5.3 Equities

A world economy that is growing by 7.5% in nominal terms at the end of the forecast period: what more could you want as an equity investor? It is certainly positive, but there are a number of drawbacks as well. The most obvious one is that this scenario will mark the end of the steady decline in the labor share as a percentage of national income, at the expense of the capital share. Due to the high growth, unemployment will decline steadily and it won't be long before employee bargaining power starts to push wages up. Although increased productivity will to some extent help to mitigate this, unit labor costs will nevertheless start to rise, eroding profit margins. Given the different regional stages of labor-market recovery, it should come as no surprise that the US is leading Europe in this process. Added to this is the rise in the cost of capital. This deterioration is expected to hit margins, albeit with some delay, as many companies have secured financing with a longer time horizon. A third factor that will eat into earnings margins are price increases for raw materials. The combination of abundant growth on the one hand and the current under-investment in exploration on the other will trigger a substantial rebound in the prices of various core commodities like energy and copper.

The actual level of price erosion will of course depend on corporate pricing power and the ability to pass on these costs to end clients. Given that the ongoing rise in international competition and the shift to online consumption is still in full swing, we feel that most companies will be restricted in the extent to which they can aggressively offload these cost increases. All in all, it is too simple to assume that the 7.5% nominal growth will also translate into 7.5% earnings growth.

As a final point, the increase in interest rates and bond yields will mean that the search-for-yield force impetus that has strongly supported stock markets in recent years will dissipate. Simply put, from an investor's perspective, there will be more return alternatives to choose from, especially at the end of the forecasting period. On balance, we expect that visibility of expected equity returns will be lower in this scenario, compared to our baseline scenario. Higher inflation will create more uncertainty with respect to monetary policy, especially if markets are speculating that inflation will overshoot its mark. Added to this is the fact that we expect the odds of a recession to rise towards the end of the forecast period, as underscored by our flat yield curve assumption. As we have seen in our special topic on recessions in the 2016-2020 edition, timing is everything, but it can have a significant impact on overall equity results. On balance we expect average returns to stay below those in our baseline scenario (6% versus 6.5%), which reflects solid results in the first half of the five-year period and more muted developments in the second half.

2.5.4 Corporate bonds

Although high growth sounds like a positive scenario for default rates, it is not as simple as that. Although the real growth component is certainly a positive factor, inflation – and linked to that – rising refinancing rates are not. Corporates have increased leverage in recent years, and although debt has been financed at favorable rates and at relatively long duration, things can go wrong once refinancing is required at substantially higher rates. Unlike the current situation, government bonds will become a more interesting investment alternative as time goes on, which means that the current low cost easy financing may come to an end. The spread compression seen in the recent search for yield phase will to a certain extent reverse. Added to this is the fact that the current direct support given by central banks (ECB and BoJ) will cease, also resulting in spread widening.

We expect IG credit spreads to steadily widen to a maximum of 160 bps, to be reached somewhere at the end of the five-year period. The loss of direct support from central banks and the increased competition from government bonds with lower risk profiles, will take their toll. Default costs are also set to rise, even though we do not expect the refinancing pressure to be felt so sharply in the credit space. With defaults rising to a peak of 30 bps at the end of the timeframe and applying a recovery rate of 30%, this means that default costs will be 20 bps on average. Adding the impact of downgrade-related trading costs, we end up with a 50 bps excess return for this asset class. If we add the blended 60-40 return for government bonds and correct for maturity differences, you are faced with a total return of -1.5%. It should be noted that this is much better than the return on the 10-year government bond. The reason for this is that euro corporate bonds in particular have shorter maturities, which will dampen the impact of a rate rise.

As for high yield, the picture is more mixed. Initially we expect spreads and defaults to respond positively to the underlying increase in growth. Once inflation starts to rise and central banks respond to this by raising rates, the refinancing pain will start to be felt. On average we expect defaults to reach 350 basis points, with most of the pain expected in the second half of the period. Applying a recovery rate of 30%, we forecast default costs to rise to an annual average of 250 bps. Spreads will also widen and steadily move above the longer-term average of 500 bps, but again, not as aggressively as in the stagnation scenario. Debt refinancing is a risk factor, but it should be stressed that high nominal growth also opens the opportunity for companies to grow out of their existing debt positions. Spreads are expected to peak at a level of around 600 bps and then decline again. The average spread earned will be around 525 bps, which will result in an excess return of around 225 bps taking into account trading costs to rebalance benchmarks. Based on the blended 80/20 base return for government bonds and the shorter maturity profile

of high yield, the net return will be roughly 1%, the best performance within the bond space. Again, we would like to stress that this outcome is very sensitive to the assumed path in our prognoses. What's more, of the three scenarios this is by far the most volatile when looking at annual price returns.



SPECIAL TOPIC

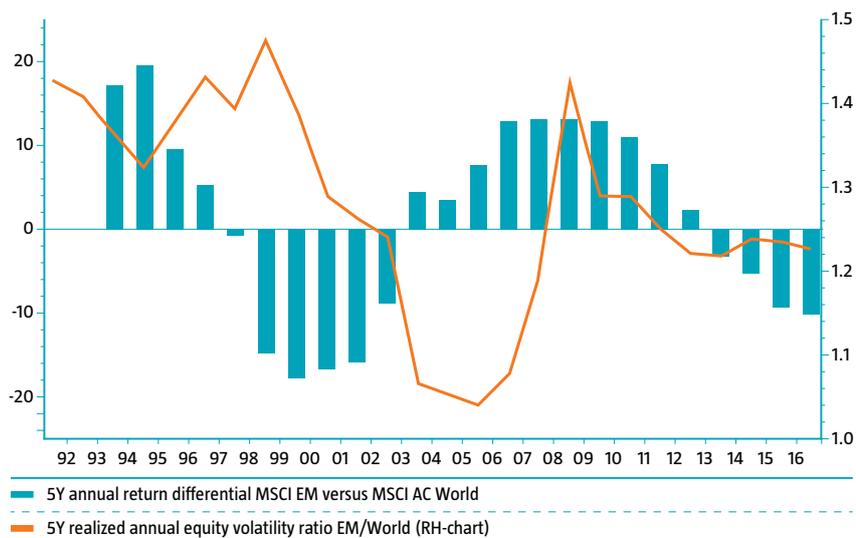
Emerging markets: The grain that will grow?

“If you can look into the seeds of time, and say which grain will grow and which will not, speak then unto me.”

Since the time when Shakespeare wrote Macbeth all those centuries ago, people have always wanted to be able to make accurate predictions. And the focus on this has only increased with the years. The future course of emerging markets has never been easy to predict and things are no different this time round. High historical returns in emerging markets have fascinated investors, but these have also been accompanied by much higher volatility than in developed equity markets. A succession of crises like the Mexican Tequila Crisis (1994), the Asian Tiger Crisis (1997-1998), the Argentinian Debt Crisis (2001) and more recently the great recession in Russia (2008) have left their marks on this asset class. In the past two decades, emerging markets have experienced bust, boom and lately a more stable phase. After the turbulent 1990s, the speed at which emerging markets started to catch up with their developed counterparts was spurred by the economic boom in China from 2002-2010. This was followed by a deceleration from 2011 onwards when the external environment worsened and the productivity growth catch-up stalled.

Not surprisingly, investors now wonder whether it is still worth investing in the region. High expectations in terms of returns have not been met recently, while volatility has remained elevated. This poor relative performance has led to significant outflows, causing emerging equities to become unloved, under-owned and cheap. Have we reached the end of this period of poor performance, or is there a good argument to part with emerging equities altogether?

Figure 1: Emerging markets – relative performance and volatility – a bad run



Source: Thomson Reuters Datastream, Robeco

Decomposition emerging market equity returns unveils high intrinsic volatility

A logical starting point in our assessment is to take a look at the decomposition of the equity returns we have seen over the past few years. The return of a share over a single period (R) can be decomposed into income return, nominal earnings growth and repricing.¹

$$R = D/P + G + \%PE$$

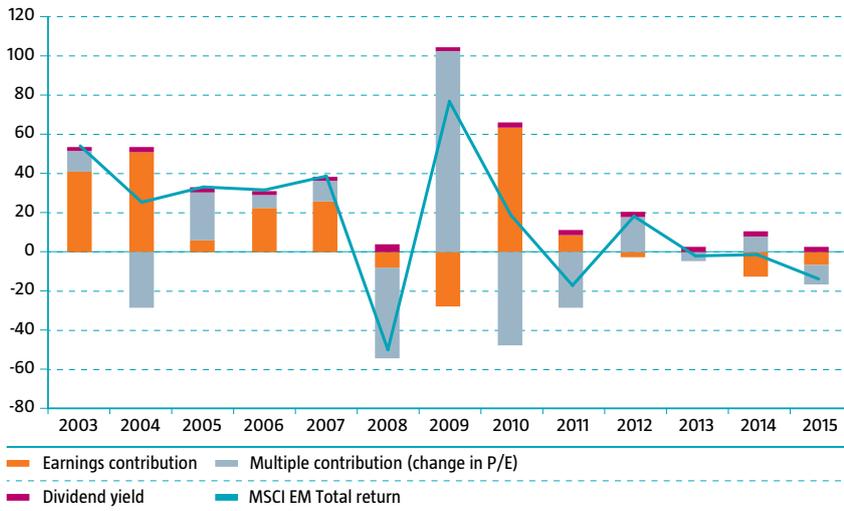
The first term, D/P, is the dividend yield or the income return. The second term, G, is the nominal earnings growth (real earnings growth + inflation). The last term, %PE, is the repricing factor, illustrating the percentage change in the P/E multiple.²

Figure 2 illustrates how these components have contributed to total returns in emerging markets over the past 12 years. The components are dynamic and so this contribution changes dramatically over time, causing emerging market total returns to be quite volatile; their historical volatility is 25%. The only seemingly stable component is the dividend yield, but this is often overshadowed by the large swings in year-on-year earnings growth and investor repricing. We will use this composition breakdown into earnings growth, dividends and repricing to try to make projections for the years to come.

1. Net share issuance plays a role as well; its dilutive effect is incorporated in our earnings growth estimate.

2. In our steady state equity return composition, the repricing factor is not mentioned specifically. This is because if we assume markets to be efficient, equity prices in the steady state reflect their fair value and the repricing element is therefore zero.

Figure 2: Emerging markets return decomposition – many moving parts



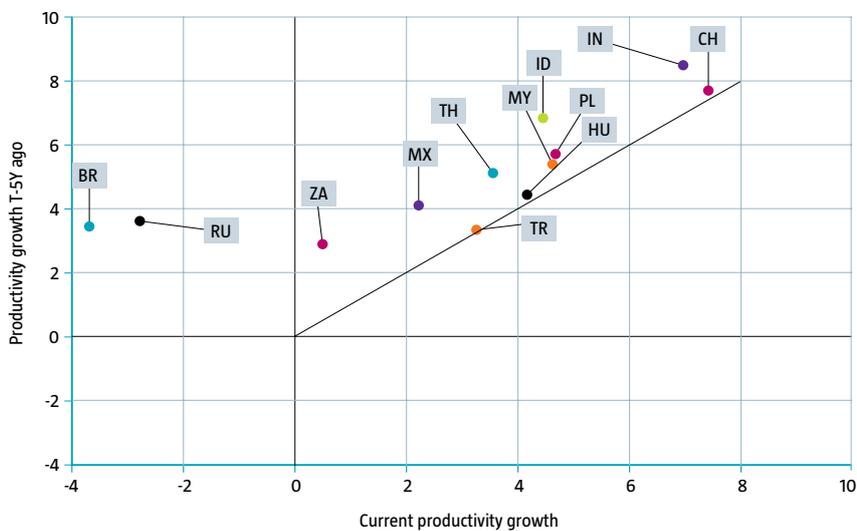
Source: Thomson Reuters Datastream, Robeco

Earnings growth will contribute again

A starting point in assessing earnings growth is to look at broader economic growth expectations. Although there are numerous reasons why GDP growth and earnings growth may deviate (margins, dilution, exports), there should be a link between the two. Ideally this link should be measured using an extensive multi-period framework. Unfortunately there is limited data available to do this, so we look at annual data from 1996. As can be seen in Figure 4, there seems to be a relationship between productivity growth and earnings per share growth.

One of the striking trends in emerging markets has been the broad and time-consistent decline in productivity growth since the financial crisis, which has resulted in a narrowing of the productivity growth gap with developed markets. Figure 3 shows that the per capita GDP in terms of purchasing power parity (PPP) is currently lower for many emerging countries than it was five years ago, with the exception of Turkey.

Figure 3: Productivity growth slowdown emerging markets (in %)



Source: Thomson Reuters Datastream, Robeco

Developments in China are all important

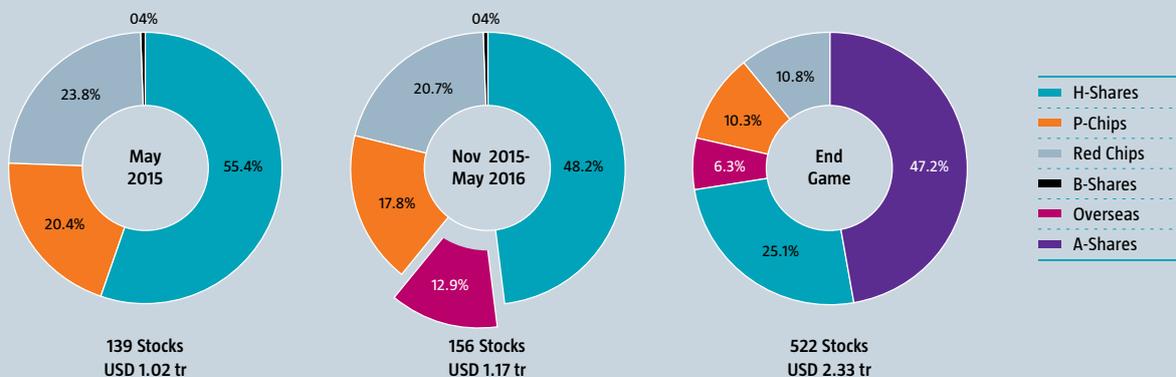
Based on the purchasing power parity valuation of economies' GDP, China has become the largest economy in the world. In 2015 China accounted for 17.1% of the world economy, compared to 15.8% for the US and 11.9% for the Eurozone. Global economic growth was 3.1% in 2015, which means that China alone accounted for roughly a third of the growth of the world economy. Developments in China are therefore of crucial importance for the global growth picture. The Chinese growth rate has declined in the last couple of years and once again suspicions have risen that the 'true' level of growth is lower than the official one. This gradual slowdown can be considered beneficial, given the Chinese government's self-declared strategy to redirect the economy away from export-led growth towards a more domestic growth model, increasingly based on domestic consumption instead of investment. However, in the interests of social stability, growth cannot be allowed to slow too much. Recently, the Chinese authorities have stepped up fiscal and monetary stimulus to address this problem. Moreover, in its newly approved Five-Year Plan, the Chinese government stubbornly sticks to a relatively high target level of growth: at least 6.5% over the next five years (2017-2021).

This paves the way for sufficient short-term monetary and fiscal stimulus to keep the economic growth rate at the desired level for the next two or three years. But given the rising debt ratios in the Chinese economy, this push for growth is generally considered to be unsustainable. We therefore think that an average growth rate of 6.5% for the whole of the next five years is unlikely. The unsustainable leverage in China increases the risk of capital flight and will make it difficult for the Chinese authorities to open up the capital account in a meaningful way. As funding the financial system is guaranteed by the government at all times, a systemic financial crisis is unlikely. On balance, we expect to see a gradually slower growth rate for the Chinese economy and a general lack of liberalization as the stimulus of short-term demand takes priority over desired structural adjustments.

Another important development for asset managers in the next few years is the possible full inclusion of China's A-shares in the MSCI EM Index. This will lead to an increased country weight for China from the current 24% to 43.6%.

MSCI roadmap for MSCI CHINA Index – gaining weight

Prior to Inclusion of China ADRs		➔	Full Inclusion of China ADRs		➔	Initial 5% Inclusion of A-shares		➔	Potential Full Inclusion of A-shares	
COUNTRY	WEIGHT (%)		COUNTRY	WEIGHT (%)		COUNTRY	WEIGHT (%)		COUNTRY	WEIGHT (%)
China	24.0		China	27.5		China	28.8		China	43.6
South Korea	16.2		South Korea	15.5		South Korea	15.2		South Korea	12.0
Taiwan	12.4		Taiwan	11.8		Taiwan	11.6		Taiwan	9.2
India	8.4		India	8.0		India	7.9		India	6.2
South Africa	7.8		South Africa	7.4		South Africa	7.3		South Africa	5.8
Other	31.2		Other	29.8		Other	29.2		Other	23.2



Sources: Bloomberg, www.msci.com

So what will happen in terms of productivity during the next five years? First, on the positive side, we think there will be a number of factors to support growth in the emerging economies:

- We expect the commodity markets to enter a new phase following the rout in commodity prices of the past two years. After a significant investment phase, which has eventually led to excess supply, the market will rebalance and shift into an exploitation phase. Historically such phases have offered better growth prospects for commodity suppliers.
- Global aggregate demand is expected to increase in our base scenario and the pickup from current subdued global trade levels should benefit emerging markets.³ Domestic consumption in emerging markets will contribute. The growth in global aggregate demand is likely to have a service-oriented bias as the marginal contributor to global growth in the next five years, China, is making a transition from an export-led economy to a more service-oriented one.
- Emerging market currencies are significantly undervalued, especially compared to the US dollar. We conclude that MSCI EM constituents are, on average, currently 6% cheaper than their long-term trend. A recent ECB study (2016) confirms that real depreciation has a strong positive effect on real per capita GDP in emerging markets over a five-year period and we expect this to feed into stronger earnings.

3. The relative performance of emerging market equities shows a high historical correlation with global trade. The weakness of global trade is quite puzzling. For an excellent analysis on this see Bank of England blog (2015), <https://bankunderground.co.uk/2015/10/28/why-has-world-trade-been-so-weak-in-recent-years/>.

So much for the good news though, as there are also a number of serious headwinds:

- South Korea and China are the economic heavyweights in the emerging equity markets. Both countries are maturing and are entering a phase of diminishing returns following earlier economic reform activities and capital accumulation. They now need to ensure a dramatic change in their economic structure from export led to consumption driven. We expect China’s growth to slow in our base case scenario to 4% real GDP growth in around 2021 and this country plays a pivotal role in the MSCI emerging market GDP growth forecast. Correlations (10Y rolling) currently show that the market-cap weighted per capita GDP of MSCI EM (ex-China) constituents has a 90% correlation with Chinese per capita GDP growth.

Figure 4: 10-year rolling correlation GDP per capita MSCI EM (EX China) – it’s all about China



Source: IMF, Robeco

- Commodity exports are expected to remain a dominant driver behind economic activity in emerging markets and a decline in the impact of commodities on global growth will also cap the upside for emerging market productivity gains, all the more so as the US becomes the new, flexible marginal supplier of oil.
- Third, innovation is the force behind per capita GDP growth, and this is often spurred by government stimulus⁴ and structural reform. Although ‘structural reform’ has become a buzzword, there is a clear need for it. Emerging economies are lagging behind developed markets when it comes to rule of law, regulatory efficiency, fiscal freedom and market transparency. Using data from The Heritage Foundation (2016), the average MSCI EM constituent country score is a meager 77th place. As McKinsey (2015) argued, there is a lot of potential to improve productivity, but ‘all levers need to be fully deployed’, something we think is unlikely to happen in the next five years. As Subramanian and Kessler (2013) showed, developing countries need policy space to restructure their economies and this is exactly where the shoe pinches.

4. See for instance Mazzucato (2013) *The Entrepreneurial State*.

In summary, although we do expect a stabilization in (cyclical) productivity growth, it is unlikely that growth will return to pre-financial crisis levels. This implies less upside for earnings from a productivity perspective.

Cyclical sources brighten earnings growth prospects

As productivity is unlikely to rebound to previous levels, what can we expect for earnings from a cyclical perspective? Although we are somewhat more positive here, one hurdle is the oil price. Clearly the dynamics of this market have changed with the US now a shale oil producer and marginal supplier, and China making a shift towards becoming a more service-oriented economy. This means we don’t expect the windfall for emerging market commodity exports which we have seen in the past. Additionally, IMF data show that labor markets are already tight, which is in sharp contrast to the episode preceding the last boom phase. Further tightening (as we and the IMF expect) will push costs up, which means that any pickup in earnings will become very dependent on the pricing power of emerging market producers.

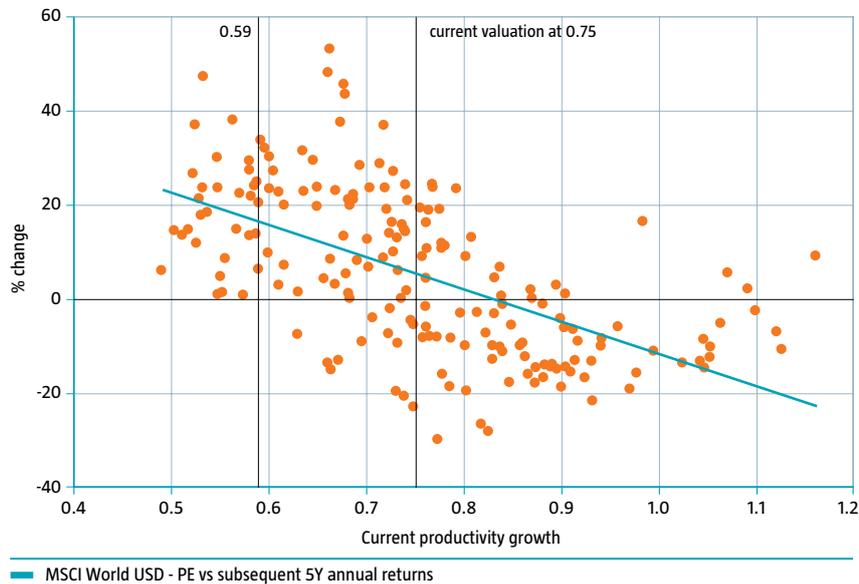
Having said that, margins are not particularly high in emerging markets. As Figure 5 shows, the profit cycle has room to improve significantly as emerging markets start to benefit from the improved competitiveness resulting from the strong depreciation of most of their currencies. An expected weakening of the US dollar could lower funding costs and lure external capital flows into these markets as profitability improves, creating a virtuous cycle. All in all, we expect earnings per share growth in emerging markets to edge up to 4.5%. This figure already takes into account the fact that not all earnings growth will be returned to existing shareholders, as a result of the dilution resulting from heavy net share issuance to finance new activities.

Repricing – reviewing the valuation argument for emerging markets

As Figure 2 clearly showed, repricing is a large swing factor affecting how stock prices move above and below the earnings per share growth. One of the main reasons for optimism in the case for investing in emerging markets today is that they are cheap. On the face of it, the MSCI Emerging Markets Index shows a discount of 25% on a standard price to earnings (P/E) basis compared to the global benchmark, while the cyclical corrected price to earnings (CAPE) which now stands at 10 is at an even larger discount when compared to historical averages. This observation is a powerful plus point for emerging markets, as low valuations bode well for outperformance relative to developed markets in the next five years, as Figure 5 shows (or see for instance Shiller 1988).

‘Although we expect productivity growth to stabilize, growth is unlikely to return to pre-financial crisis levels’

Figure 5: Current relative multiple and 5Y subsequent relative annual performance – high discount, high subsequent excess returns

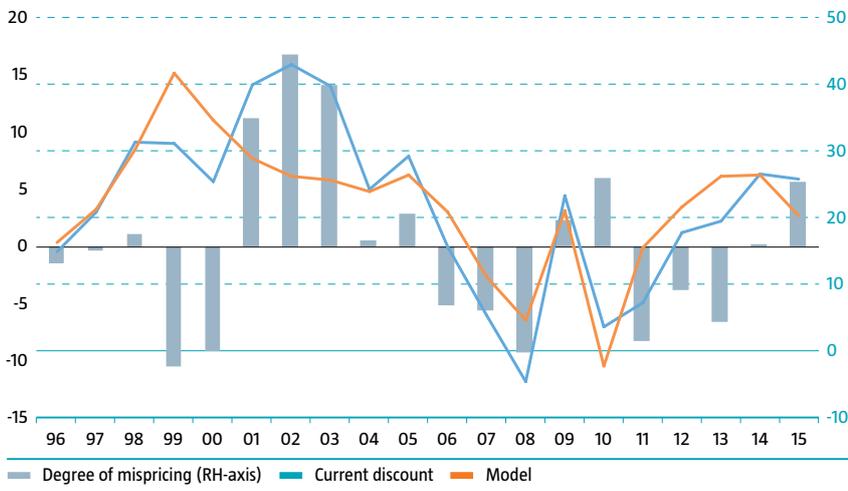


Source: Datastream, Robeco

Based on the historical relationship between the standard relative price earnings ratio and subsequent five-year annual returns as shown above, the current emerging market valuation discount indicates an annual excess performance for emerging market versus their developed peers of 4.5% over the next five years. But historical volatility of these excess returns is high: there is considerable variation in subsequent five-year excess returns given the current discount, ranging from -20% to +20%! However, despite this optimism on valuations, we must examine whether the current deep discount in emerging markets is largely due to excessive investor pessimism or whether stocks are cheap for a reason with the discount merely reflecting underlying macro risks. In order to answer this question, we have tried to explain historical relative valuation levels by regressing the macro risk factors in the earnings section.

Recently observed macro risks such as the rout in the commodity markets, strong US dollar appreciation and slowing Chinese growth relative to the US could all be viable explanations for this significant discount. In fact, regressions show that historical variations in the relative valuations of the MSCI EM and the MSCI AC World since 1996 can be explained by all these independent macro factors, i.e. the expected China-US growth differential one year ahead, the one-year change in commodity prices and the one-year change in the trade-weighted dollar. In a joint regression, the US dollar and commodity prices lose explanatory power at a 5% significance level when corrected for the expected China-US growth differential one year ahead. This is not surprising given the strong economic interlinkage between the global commodity market, the dollar and China in the past.

Figure 6: Emerging market valuation discount and degree of mispricing – predominantly cheap for a reason



Source: Datastream, Robeco

So it seems as if the market has priced in the ‘China factor’ as a systematic risk and this has, in part, shaped the valuation discount since 2011, when the landing phase in emerging markets became apparent. The current fair value level based on the regression equation suggests the emerging market discount should be as much as 20% instead of the actual 25%. But the degree of mispricing has been far larger in history. It should be noted that during the years 2001-2003, our simple model suggested the discount was overshooting by almost 20%, creating the potential for future stock prices to appreciate more than earnings as, we can now conclude with hindsight, investors underestimated the power of the Chinese growth engine.

In years that followed, a steady multiple expansion followed as investors repriced emerging market equity risks, eventually eroding the entire valuation discount versus developed markets by around the start of 2008. Given the absence of such mispricing today in our view, we think a repeat of this episode is less likely to occur in the next five years.

From a fundamental perspective, the central story is that China will deliver below consensus growth rates. The ensuing uncertainty surrounding the economic transition China faces, will leave investors demanding an even higher discount in the coming years. The discount of 40% we expect to see in around 2021, has historically always delivered positive excess returns in the subsequent five years. Also, in this sense it’s darkest just before dawn.

‘So it seems as if the market has priced in the China factor as a systematic risk’

Figure 7: EM valuation discount scenarios – up in next five years, not down



Source: Thomson Reuters Datastream, Robeco

Dividend yield remains stable factor

The return component that has become increasingly attractive during the landing phase is the dividend yield. This is 3.0% for the MSCI EM Index, 20 basis points above the current dividend yield of the MSCI AC World Index. This dividend yield differential corresponds with the average seen over the past 20 years. The dividend yield depends on earnings (which we do expect to pick up from current levels), payout ratios and stock prices. Payout ratios are not fixed and are largely a function of corporate capital expenditure. We think overall capex in emerging markets is lower when commodity markets enter an exploitation phase. This raises the payout ratio in conjunction with a somewhat higher expected earnings yield.⁵ Adding both these forces together, we expect slightly higher dividend yields of around 3.25% in the next five years.

5. Earnings yield (Earnings/Price) rises as we expect the absolute earnings multiple (Earnings/Price) to decline somewhat in the next five years.

Emerging markets relatively attractive compared to developed markets

Are emerging markets the ‘grain which will grow’ in the next five years? Our analyses suggest that a cautious stance is warranted. We do not expect multiple expansion over the next five years and expect the discount of emerging markets relative to developed markets to increase further as uncertainty about China sets in. We do expect an improvement in corporate profitability compared to developed markets, but with the emphasis on earnings growth, returns will probably be highly volatile. However, we also observe that the return prospects for developed market investors are brighter as emerging market currencies are expected to appreciate against developed market currencies. Overall, we prefer a cautious overweight for emerging market stocks relative to their developed market counterparts.

The following expected five-year return decomposition for emerging market equities in local currency follows on from our analysis above.

In local currency		In euro	
		FX return in euro	1.25%
Repricing	-0.50%	Repricing	-0.50%
Earnings-per-share growth	4.50%	Earnings-per-share growth	4.50%
Dividend yield	3.25%	Dividend yield	3.25%
Total expected return	7.25%	Total expected return	8.25%

3

Long-term expected returns

In this section we build on the methodology from previous editions to derive the expected long-term returns on a wide set of asset classes, in a similar fashion to Bekkers, Doeswijk and Lam (2009). We take an unconditional long-term view, which means that the current economic environment is not relevant. These long-term expected returns can be used as the equilibrium returns for asset-liability management (ALM) studies for long-term investors such as pension or endowment funds.

We realize that there is much uncertainty about our estimates. Nevertheless, we attempt to derive these estimates by using thorough empirical and theoretical research methods. We round expected returns to the nearest quarter, i.e. 0.25% precision, and volatilities to the nearest 1%. The estimates should reflect net returns for investors that want to gain exposure to each asset class. For liquid assets, transaction costs and management fees are low, and only play a marginal role when rounding expected returns to the nearest 0.25% precision. We also discuss those occasions when costs actually play a larger role. The impact of investment fees is largest for alternative assets such as private equity and hedge funds that cannot be tracked at low cost.¹

In addition to estimates for asset classes we provide estimates for factor premiums within credits, equities and commodities. Most factors we discuss have been documented extensively in academic literature. We do believe it is sensible for investors to consciously decide on their level of exposure to these factors. There are two reasons why we take a conservative approach on the excess returns for these factors. Firstly, Chordia, Subrahmanyam and Tong (2013) and more recently McLean and Pontiff (2016), argue that many popular equity return anomalies have experienced declining excess returns due to anomaly-based trading. Secondly, trading costs might reduce the real-life profitability of these return factors.

In line with the recommendations of the Dutch Association of Investment Professionals (VBA), the expected returns are geometric returns that are better suited to long investment horizons.² Since we also estimate the volatility risk of each asset class, interested readers can convert the geometric return to an arithmetic expected return if they wish to do so.³ Our estimates are based on the worldwide market capitalization-weighted asset class. We also compare our estimate with the maximum allowed expected return according to the Dutch Pension Law and the volatility risk that is published by the Financial Services Authority in the Netherlands.^{4, 5}

3.1 Inflation, cash and bonds

We start by investigating the 2015 database compiled by Dimson, Marsh and Staunton. For each of the 21 countries in their database we calculate the compounded rate of inflation, the compounded real rates of return for cash, bonds and equities, and the excess returns over the 115-year period 1900-2014. Table 3.1 shows the results. We also calculate the average and a median over the 21 countries.

Inflation

In the long term, inflation around the globe has been significantly higher than we have seen over the past two decades. Germany is an outlier with its hyperinflation period in the early part of the sample period, resulting in an average inflation rate of 30.6% per year. The median compounded inflation rate equals 4.1%. Although central banks in developed markets target inflation at 2%, we doubt whether they will succeed in the long run.⁶ It would be lower than historically observed in any country. Moreover, inflation in emerging markets is somewhat higher than in developed markets. In other words, from an inflationary perspective, the last two decades have been exceptional. Globalization and the opening up of the former USSR, Latin America, China and India have also played a role, as this has increased the potential labor force by more than two billion workers.

Another way of describing the history of inflation is to map all 2,415 inflation figures that we have for 21 countries over 115 years – see Figure 3.1. Using this method, as illustrated in the distribution frequency, it appears that inflation most often falls in the range of 2-3%, with 334 observations, and the median of these individual observations together comes in at 2.6%. Next, it clearly shows an asymmetric distribution: there are far more years in

1. We also tried to address Environmental, Social, and Governance-related risk factors such as climate change, but given the limited research available we do not explicitly take this into account to determine the long-term asset returns. See, for an elaborate overview of the impact of climate change on returns of asset classes, Mercer (2011) and our special topic in this edition of Expected Returns.

2. VBA (2010) Het toezicht op pensioenbeleggingen: Aanbevelingen van het VBA voor het FTK.

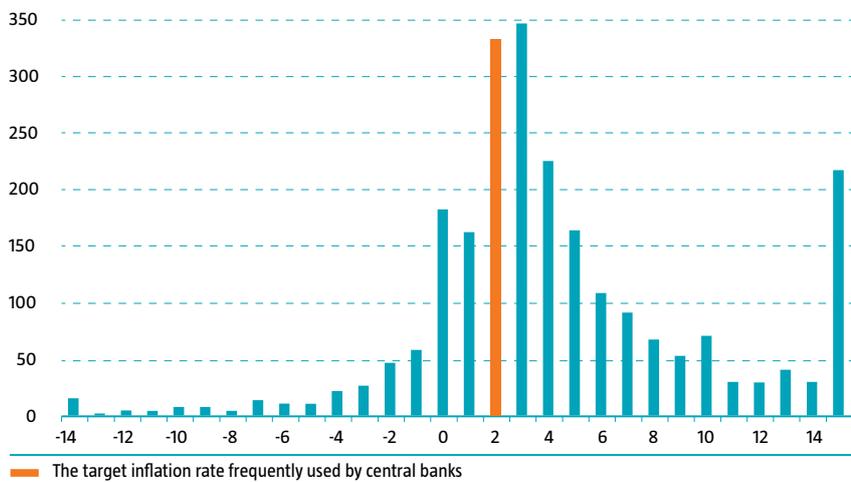
3. Under the assumption of log-normally distributed returns the arithmetic average is the geometric average plus half of the variance of the returns; see Campbell, Lo, and MacKinlay (1997, p. 15).

4. Article 1 published in the Staatsblad van het Koninkrijk der Nederlanden on 24 July 2010 extends the Besluit financieel toetsingskader with two additional articles, 23b and 23c.

5. The Financial Services Authority in the Netherlands is called the Autoriteit Financiële Markten (AFM).

6. Please note that inflation targeting usually takes place without exactly specifying what the central banks are targeting. So while central bankers might be interested in the number of years the inflation was close to 2%, a typical investor would also experience inflation spikes that results in an average inflation rate of 4.0%.

Figure 3.1: Distribution frequency of 2,415 annual inflation data (1900-2014, 21 countries, in %)



Source: Dimson-Marsh-Staunton database (2015), Robeco

which inflation is above 2% than below 2%. A future distribution is likely to show the same asymmetry, as we have yet to meet a central bank that argues in favor of targeting a period of deflation after a period of overshooting the target inflation rate, as this would detract from its ability to achieve its target rate.

Our view is that when making long-term predictions about inflation, investors should consider both past and present inflation targets. We believe long-term inflation to be around 3% as a compounded average. That is right between the central banks’ inflation target of 2% and the empirical reality of the 4.1% median compounded inflation over the period 1900 to 2015. It therefore seems to be a conservative estimate, being below the 4.1% median and the 6.3% average of the 21 individual compounded inflation rates. Note that the median is less sensitive to outliers (such as Germany) than the average of the data series. We do not make a distinction between the different inflation expectations of regions or countries, as it is hard to find strong arguments for this. Finally, we would like to point out that our long-term estimate is one for an average compounded inflation rate. As we envisage, this results from lengthy periods with inflation of around 2%, and some periods with inflation spikes above 2%.

3.1.1 Cash

For cash we suppose the real rate of return to be 0.5%, roughly in line with the historical median of 0.7%. Note that the average of -0.3% is heavily impacted by some cases of hyperinflation. There is a wide dispersion in real cash returns. No less than seven out of 21 countries in our sample experienced negative real returns on cash.

Table 3.1: Historical returns for several markets over the period 1900-2014

	Inflation	Real returns			Excess returns over cash	
		Cash	Bonds	Equities	Bonds	Equities
Australia	3.8%	0.7%	1.7%	7.3%	1.0%	6.6%
Austria	12.8%	-8.1%	-3.8%	0.6%	4.7%	9.4%
Belgium	5.1%	-0.3%	0.4%	2.7%	0.7%	3.0%
Canada	3.0%	1.5%	2.2%	5.8%	0.7%	4.2%
Denmark	3.8%	2.1%	3.3%	5.3%	1.1%	3.1%
Finland	7.1%	-0.5%	0.2%	5.3%	0.7%	5.9%
France	7.0%	-2.8%	0.2%	3.2%	3.0%	6.1%
Germany	30.0%	-2.3%	-1.4%	3.2%	1.0%	5.7%
Ireland	4.1%	0.7%	1.6%	4.2%	0.9%	3.5%
Italy	8.2%	-3.5%	-1.2%	1.9%	2.5%	5.7%
Japan	6.8%	-1.9%	-0.9%	4.1%	1.0%	6.1%
Netherlands	2.9%	0.6%	1.7%	5.0%	1.1%	4.4%
New Zealand	3.7%	1.7%	2.1%	6.1%	0.4%	4.4%
Norway	3.7%	1.1%	1.9%	4.2%	0.7%	3.1%
Portugal	7.4%	-1.1%	0.8%	3.4%	1.9%	4.6%
South Africa	4.9%	1.0%	1.9%	3.5%	0.9%	2.5%
Spain	5.7%	0.3%	1.8%	6.1%	1.5%	5.8%
Sweden	3.4%	1.9%	2.8%	4.5%	0.9%	2.6%
Switzerland	2.2%	0.8%	2.3%	5.3%	1.5%	4.4%
United Kingdom	3.9%	0.9%	1.6%	6.3%	0.7%	5.3%
United States	2.9%	0.9%	2.0%	5.3%	1.2%	4.4%
World	2.9%	0.9%	1.9%	5.2%	1.0%	4.3%
Average	6.3%	-0.3%	1.0%	4.4%	1.3%	4.8%

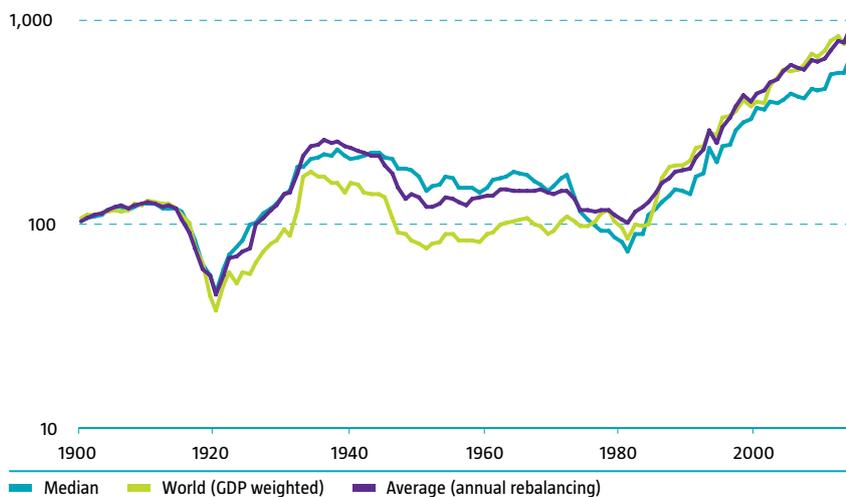
Source: Dimson-Marsh-Staunton database (2015), Robeco

3.1.2 Government bonds

We suppose the real return on bonds to be 1.25%, which is the sum of a 0.5% real return on cash and a 0.75% term premium on bonds. This real-return estimate is significantly below the historical median of 1.68% and the 1.9% for the GDP-weighted global bond index. Due to the strong recent performance of bonds, this figure has gradually moved higher, making a 1.25% real return estimate look very conservative compared to long-term history. Still, we refrain from a further upward adjustment of the real return as we believe that real returns in the near future will be negative, which will bring down the real return on the global bond index. Our total expected nominal return on bonds is 4.25%, as our expected long-term inflation rate is 3%.⁷ The estimate for the long-term return on bonds is 0.25% lower than our estimate of long-term economic growth. This discount is validated by our observation that the median capture of real GDP growth by real bond returns over the past 114 years for the 20 countries in the DMS database is only 91%, and the average capture a mere 58%. This suggests bond investors are not fully compensated for economic growth risks in the long run.

7. The European Commission has suggested an Ultimate Forward Rate of 4.2%, which is close to our long-term return estimate on high-quality government bonds of 4.5%. The arguments used by the European Commission are very different to ours. They expect a 2% inflation rate and a 2.2%(!) real interest rate in the long run.

We would like to point out that, unlike in the case of equities (which we will discuss later), the real returns generated on bonds have not risen gradually over time. As Figure 3.2 shows, real bond returns were roughly flat in the period 1900-1980. Since then the real annual compounded return has been in excess of 6%. This dynamic historical pattern suggests that our real return estimate for bonds is more uncertain than it is for equities.

Figure 3.2: Real return index for global bonds with different weighting methods

Source: Dimson-Marsh-Staunton database (2015), Robeco

3.1.3 Credits

For high yield, investment grade credits and inflation-linked bonds, we use estimates for risk premiums versus government bonds as calculated by Bekkers, Doeswijk and Lam (2009). Below, we expand on the reasoning behind this. We discuss the categories in order of historical data availability. Table 3.2 shows historical excess returns for investment grade credits, high yield and inflation-linked bonds. According to Elton, Gruber, Agrawal and Mann (2001), the credit spread comprises the following three components: default risk compensation, the tax premium and systematic default risk premium. Additionally, Bongaerts, De Jong and Driessen (2011) also find a liquidity premium in credit spreads. Houweling, Mentink and Vorst (2005) estimate the liquidity premium to be between 13 and 23 basis points.

We estimate the total risk premium of credits over government bonds at 0.75% as we think the findings of Altman (1998) and Giesecke, Longstaff, Schaefer and Strebulaev (2011) are far closer to the true credit premium than the historical excess return in the corporate bond indices calculated and published by Barclays Capital.⁸ Over the period 1973 to 2013 the excess return for the Barclays Capital Aggregate Bond Index amounts to 0.4%. Over the period 1983 to 2013 the average excess return equals 0.9%, close to our long-term expected return. For this sub-period, we also have high yield data available which shows that the return difference between credits and high yield was 1.3% during this period.

We note that the Barclays Capital Aggregate Bond Index does not contain bonds with less than one year to maturity and investors are forced to sell bonds when they are rated below investment grade. Ng and Phelps (2011) find that relaxing these constraints leads to approximately a 0.4% additional return compared to constrained indices. This is a substantial increase and investors should be aware of this benchmark issue when investing in credit bonds.

Low-volatility credits

In addition to the low-risk effect that is present in equity markets, recent research also indicates a similar phenomenon in credit bonds. This implies that credits with low distress risk and a short time to maturity achieve the same returns as the credit bond market as a whole. Illmanen, Byrne, Gunasekera and Minikin (2004) focus on short-dated credits.

8. We might be tempted to use Ibbotson's longer data series instead of those of Barclays. However, Hallerbach and Houweling (2011) argue that the Ibbotson's long-term credit series is an unreliable source from which to calculate excess returns, as most credits are of extremely high credit quality and the series is not appropriately duration-matched with the long-term government bond series.

Moreover, several recent literature studies, like Houweling and Van Zundert (2015) and Frazzini and Pedersen (2014) show higher risk-adjusted returns for investors in low-risk credits than for the credit market as a whole. Our conservative assumption is that the expected return on the low-risk credit bond asset class is 50 bps above the credit market as a whole.

3.1.4 High yield

High yield bonds require a higher default premium than corporate bonds due to the lower creditworthiness of the issuers and hence their higher risk profile. Altman (1998) also examines the return on US high yield bonds compared to US Treasuries over the period 1978-1997. The excess return of high yield over Treasuries during this 20-year period is 2.5%. We believe that this figure significantly overstates the risk premium of high yield. At the start of the sample period the high yield market was still immature with the associated liquidity problems and biases. Our sample period from 1983 to 2013 has a risk premium for high yield bonds of 1.7% over government bonds. We proceed with a 1.75% premium over government bonds, assigning more weight to our sample than Altman's older sample.

We still want to discuss the possible negative impact of transaction costs on investors' ability to achieve our estimated returns for corporate bonds. We believe that a buy and hold investor should easily be able to achieve the returns that we project. To illustrate this, the median spread on US investment grade corporate bonds has been 1.2% since 1983 (average 1.4%), and 5.1% for US high yield since 1987 (average 5.5%). After applying a typical default rate of 0.2% and recovery rate of 60% for investment grade, and 3-5% and 40% respectively for high yield, this should bring our estimated returns within reach. This results in a typical credit loss for investment grade of 0.1% and close to 3% for high yield. However, we note the argument of Houweling (2011) that the returns for corporate bond indices are difficult to replicate as transaction costs for corporate bonds are higher than for government bonds which are more liquid and cheaper to trade. For government bonds he reports an underperformance of 16 basis points for the average Exchange Traded Fund in his study, while for investment

Table 3.2: Estimated excess returns for investment grade credits, high yield bonds and inflation-linked bonds

	Excess returns		Volatility	Period
	over cash	over bonds		
Investment grade credits				
Robeco (using Barclays data on US credits)	2.6%	0.4%	5.3%	1973-2013
Robeco (using Barclays data on US credits)	4.2%	0.9%	5.6%	1983-2013
Altman (1998)		0.8%	5.4%	1985-1997
Giesecke, Longstaff, Schaefer, Strebulaev (2011)		0.8%		1866-2008
Ng and Phelps (2011)		0.3%		
High yield bonds				
Robeco (using Barclays data on US high yield)	5.0%	1.7%	8.6%	1983-2013
Altman (1998)		2.5%	5.2%	1978-1997
Ng and Phelps (2011)		3.1%		
Inflation-linked bonds				
Robeco (using Barclays data on US IL bonds)	4.2%	1.0%	5.8%	1998-2013
Hammond, Fairbanks, and Durham (1999)		0.5%		-
Grishchenko and Huang (2008)		0.1%		2004-2006

Source: Robeco

grade bonds he reports an underperformance of 56 basis points, and for high yield funds the average underperformance amounts to as much as 384 basis points. Obviously, the liquidity or lack of it for these asset classes requires extra attention in terms of portfolio implementation. Passive index investing is likely to disappoint investors.

3.1.5 Inflation-linked bonds

The return to maturity on (default-free) inflation-linked bonds comprises the real interest rate and the realized inflation rate. Intermediate returns depend on changes in expected inflation. This differs from the return on default-free nominal bonds which consists of a real interest rate, expected inflation and an inflation-risk premium. The cost of insurance for inflation shocks should be reflected in a discount in the risk premium for inflation-linked bonds relative to nominal bonds. Theoretically, the inflation risk premium should be positive. In the period 1998-2013 the inflation risk premium in the US has been negative, as shown in Table 3.2, as inflation-linked bonds earned a 1.0% higher return than nominal bonds.⁹ When the inflation-risk premium is positive, we expect inflation-linked bonds to underperform nominal bonds of the same maturity. Instead, nominal government bonds lagged inflation-linked government bonds. Grishchenko and Huang (2012) point to liquidity problems in the Treasury Inflation-Protected Securities (TIPS) market as the reason for the low inflation risk premium that they document. After adjusting for liquidity in TIPS they find an inflation risk premium of between -0.09% and 0.04% over the period 2000-2008, depending on the proxy used for expected inflation. They estimate the liquidity premium to be around 0.13%. Hammond, Fairbanks, and Durham (1999) estimate the risk premium at 0.5%.¹⁰ On the basis of these findings we estimate the premium of nominal bonds over inflation-linked bonds to be 0.25%. This results in an ex-ante estimated total nominal return of 4% for inflation-linked government bonds relative to 4.25% for nominal government bonds.

3.1.6 Emerging market debt

Emerging market debt (EMD) is a fast-growing asset class with dynamic characteristics. The size of the emerging market corporate debt market has grown significantly in recent years as the BIS noted in its 85th annual report. Total issuance by non-financial and non-bank financial corporations amounted to USD 138 billion in 2014. As data availability is limited, it is impossible to take a firm view on risk and return for this asset class. Moreover, it is not a completely homogenous asset class.

In Table 3.3 we compare global government bonds, credits, high yield and EMD. Here, we have created two baskets of EMD. Both baskets have a monthly rebalanced three-quarter weight in sovereign bonds in local currencies and a one-quarter weight in EMD corporate debt issued in USD. The difference is whether or not one hedges the sovereign debt. Usually, investors maintain some level of currency exposure. Without currency exposure, EMD has on average returned 7.0% a year in (roughly) the past ten years, a 2.75% premium over (global developed market) government bonds. With currency exposure, the return was 11.2% and the premium 6.7% while the standard deviation for EMD was twice as high at 10.8% for unhedged portfolios than it was for those which were hedged (5.3%). Ex-ante, we position EMD between credits and high yield for two reasons. Firstly, both US corporate dollar-denominated debt and unhedged local currency sovereign debt have had standard deviations that are roughly in line with those of high yield. Secondly, the average credit ratings for Treasury (AA2/AA3), euro credits (A1/A2), sovereign emerging debt (BAA2) and global high yield (BA3/B1) indicate that from a credit rating perspective, EMD should also be placed between credits and high yield. So we estimate the EMD premium over government bonds to be 1.75%, which brings the nominal return to 6%. This is one notch below our return estimate for high yield bonds, as we believe the risk profile is closer to high yield

9. This could be due to differences in duration between nominal and inflation-linked bonds, and their tax treatment, and the slightly higher credit risk in inflation-linked bonds due to the cash flow pattern that is further into the future.

10. For a sample of developed and emerging market inflation-linked bonds, Swinkels (2012) estimates returns on maturity matched nominal and government bonds to be virtually the same, indicating that the inflation risk premium in practice is small. This could be partially due to the lower liquidity of inflation-linked bonds compared to nominal government bonds.

bonds than to credits. Once again, we stress that this asset class is young and dynamic and so we feel less certain about this estimate than for asset classes that have a longer history and more data to back up our estimates.

Table 3.3: Return and risk for emerging debt and other fixed income asset classes (2003-2013; hedged USD unless noted otherwise)

	Return	Annualized st.dev.
Global government bonds	4.5%	3.0%
Investment grade credits	5.3%	4.1%
High yield	11.3%	10.3%
Emerging market debt (3/4 sovereign unhedged USD, 1/4 corporate)	11.2%	10.8%
Emerging market debt (3/4 sovereign hedged USD, 1/4 corporate)	7.0%	5.3%
<i>Sovereign local emerging debt</i>	6.4%	4.4%
<i>Corporate debt emerging debt (USD issuance)</i>	8.7%	10.2%
<i>Sovereign local emerging debt (unhedged USD)</i>	12.0%	11.8%

Source: Barclays, Robeco

As can be seen from Table 3.4, our expected returns generally differ by 0-0.25% from those of the VBA /AFM, with the exception of high yield, for which our estimate is 0.5% lower. Comparing our results to those of the Dutch central bank (DNB) we see larger differences. For their long-term government bond estimate they use the ultimate forward rate (UFR), which is currently close to 3%. The other fixed income categories are a combination of this government bond return and an equity return of 7%. For example, 40% of the high yield return is derived from the government bond return and 60% from the equity return, resulting in 5.4%. Our volatility estimates are higher than VBA /AFM for the safer assets (e.g. 5% versus 3.5% for government bonds), and lower for high yield bonds (12% versus 15%).

Table 3.4: Long-term expected returns for fixed income asset classes

Long-term expected returns	Robeco		DNB*	VBA / AFM	
	Return	Volatility	Max return	Return	Volatility
Inflation	3%	-	-	-	-
Cash or money markets	3.5%	3%	-	-	2.5%
High-quality government bonds	4.25%	5%	3%	4.5%	3.5%
Inflation-linked government bonds	4%	6%	3%	-	-
Investment grade credit bonds	5.25%	6%	3.6%	5%	5%
<i>Low-volatility credits</i>	5.25%	4%	-	-	-
Emerging government debt	6%	10%	4.5%	6.25%	10%
High yield credit bonds	6.25%	12%	5.4%	6.75%	15%

* Eurozone bond estimate. Source: Robeco

3.2 Equities

We again begin by using the data compiled by Dimson, Marsh and Staunton. For 21 countries, over the period 1900 to 2014, the average and the median risk premiums of equities over cash were 4.7% and 4.2% respectively, while over bonds they were 3.6% and 3.4% (see Table 3.5). Dimson, Marsh and Staunton (2013) calculated a global risk premium of equities over cash with a new methodology using a broader dataset than before. They

LONG-TERM EXPECTED RETURNS

used a market capitalization world index instead of a GDP weighted index and also took China and Russia into account. As a result, their calculation for the excess return of their global equities index over cash and bonds delivers 4.1% and 3.2% respectively.

In Chapter 4 we derive the ex-ante real global equity return from a theoretical point of view, which we estimate to be around 4%. Adding 3% inflation results in an estimate for the nominal total return of around 7%. This implies a risk premium of 3.5% versus cash. Relative to bonds the theoretical estimate for the equity risk premium would be 2.75%, taking our bond risk premium over cash of 0.75% into account. For reasons explained in more detail in Chapter 4, this is somewhat below the historical valuation-adjusted average and median figures of 3.4% and 3.2% respectively.

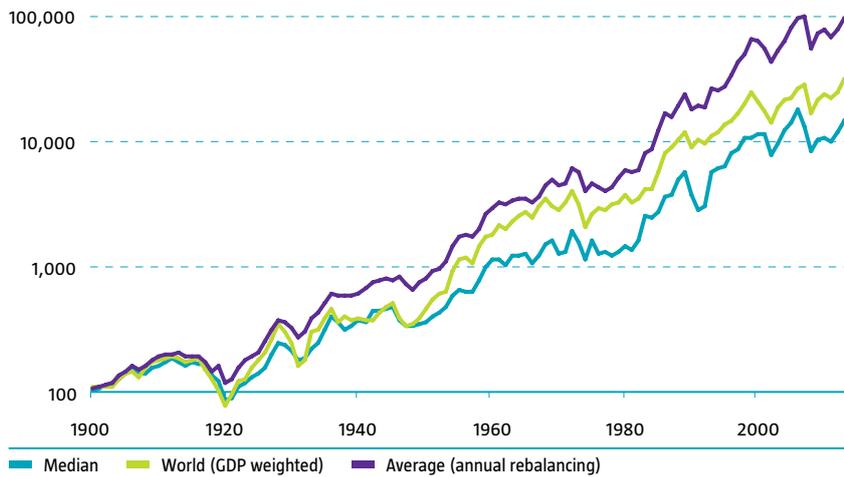
Table 3.5: Historical returns for several markets over the period 1900-2014

	Excess return equities over			Valuation adjusted excess return equities over		
	Inflation	Cash	Bonds	Inflation	Cash	Bonds
Australia	7.3%	6.6%	5.6%	7.0%	6.3%	5.2%
Austria	0.6%	9.4%	4.5%	0.3%	9.2%	4.3%
Belgium	2.7%	3.0%	2.3%	2.5%	2.8%	2.1%
Canada	5.7%	4.1%	3.4%	5.2%	3.6%	2.9%
Denmark	5.0%	2.8%	1.8%	3.8%	1.7%	0.6%
Finland	5.2%	5.8%	5.3%	5.4%	5.9%	5.5%
France	3.0%	5.9%	3.0%	2.9%	5.8%	2.9%
Germany	3.1%	5.6%	4.8%	2.7%	5.2%	4.4%
Ireland	3.8%	3.2%	2.6%	3.6%	3.0%	2.4%
Italy	1.8%	5.6%	3.4%	1.8%	5.7%	3.4%
Japan	3.8%	5.7%	4.8%	2.9%	4.8%	3.9%
Netherlands	4.9%	4.2%	3.3%	4.5%	3.8%	2.9%
New Zealand	5.9%	4.2%	3.7%	6.8%	5.0%	4.5%
Norway	4.1%	2.9%	2.2%	4.0%	2.8%	2.1%
South Africa	7.3%	6.3%	5.4%	7.1%	6.0%	5.1%
Spain	3.4%	3.1%	2.1%	3.9%	3.6%	2.5%
Sweden	5.6%	3.6%	2.9%	5.5%	3.5%	2.8%
Switzerland	4.2%	3.4%	2.0%	4.2%	3.3%	1.9%
United Kingdom	5.2%	4.3%	3.7%	5.2%	4.2%	3.6%
United States	6.3%	5.3%	4.2%	5.8%	4.8%	3.7%
World	5.0%	4.1%	3.2%	4.6%	3.7%	2.8%
Average	4.4%	4.7%	3.6%	4.2%	4.5%	3.4%
Median	4.5%	4.2%	3.4%	4.1%	4.5%	3.2%
Median incl. China and Russia	4.2%	4.2%	3.3%	3.9%	4.0%	2.9%

Source: Dimson-Marsh-Staunton database (2015), Robeco

We would still like to stress that the real return on equities has been realized gradually in the past. Annual volatility for stocks is obviously higher than for bonds, but over a 115-year horizon there has been a consistently upward sloping real return, as illustrated in Figure 3.3.

Figure 3.3: Real return index for global bonds with different weighting methods



Source: Dimson-Marsh-Staunton database (2015), Robeco

We make a distinction between the equity risk premiums for developed and emerging markets, mainly because most of the investment management industry is organized in this way. We have outlined the differences in economic growth between developed and emerging markets in Chapter 5. Several researchers have argued that equity risk premiums can be higher for countries that are less integrated into global financial markets; for examples, see Errunza and Losq (1985) and Bekaert and Harvey (1995). Also, developed markets tend to have better governance, which should result in a higher risk premium for emerging markets. Furthermore, Erb, Harvey, and Viskanta (1996) and Damodaran (2009) argue that country credit spreads are related to the magnitude of the equity risk premium in that particular country. Since most emerging markets have become more integrated into the global financial markets and country credit spreads have decreased substantially, the estimated excess returns of emerging markets relative to developed markets have also decreased in recent years.¹¹ Hence, we assume that developed equity markets return 7% and emerging equity markets return 7.5% per annum. For long-term expected returns, we do not separately discuss regional equity premiums. Our approach focuses on well-documented return premiums within global equity markets on small, value, momentum, and low-volatility stocks.

¹¹ See Salomons and Grootveld (2003) for a discussion of the emerging markets equity premium relative to that of developed markets.

Table 3.6 contains the excess returns relative to the risk-free rate for the US stock market between 1963 and 2009. See Blitz (2012) for more details on how these portfolios are formed. The return premium on small capitalization stocks is partially reduced by the higher risk, measured by their Capital Asset Pricing Model (CAPM) beta and volatility. The 1.8% higher return that small stocks have relative to the market capitalization weighted index is reduced to 1.1% when the higher beta is taken into account. The excess returns for value and momentum are substantially higher, leading to a CAPM alpha of 4.6% per annum. Note that these estimates do not yet include transactions costs. This might be a larger problem for the momentum strategy as this requires trading each stock approximately once a year (assuming one-year momentum) while the holding period for value strategies is typically three to five years. The excess return of 5.9% for low-volatility

stocks, which corresponds with a 3.0% CAPM alpha, comes with a lower volatility than the market capitalization-weighted index.

These strategies do not by definition earn excess returns each year, as they also have sustained periods of negative excess returns. For example, in the period leading up to the internet bubble, valuation strategies severely underperformed the market capitalization-weighted index. Moreover, executing these strategies is not as simple as following a market capitalization-weighted index – several types of choices have to be made on rebalancing frequency (see, e.g., Blitz, Van der Grient and Van Vliet 2010) and the exact definition of the strategy parameters (see, e.g., Blitz and Swinkels 2008). Hence, it is difficult to define a uniform value premium. Here, we take the academically most established definitions from Fama and French (1992) for value and size, from Carhart (1997) for momentum, and from Blitz and Van Vliet (2007) for low-volatility stocks.

Table 3.6: Historical data on excess returns for the US equity markets 1963-2009

	Excess return	CAPM alpha	Volatility
Cap-weighted index	3.9%	-	15.6%
Small stocks	5.7%	1.1%	20.0%
Value stocks	8.3%	4.6%	17.4%
Momentum stocks	8.8%	4.6%	18.5%
Low-volatility stocks	5.9%	3.0%	13.3%

Source: Blitz (2012), Robeco

The historical evidence on the US is overwhelming and many authors have empirically detected the same return factors in other countries; see, e.g., Rouwenhorst (1998, 1999) and Van der Hart, Slagter and Van Dijk (2003), Van der Hart, De Zwart and Van Dijk (2005), and De Groot, Pang and Swinkels (2012). For example, Chen, Petkova and Zhang (2008) estimate a value premium relative to the market of approximately 3% per annum for the US over the period 1945 to 2005. Kim (2012) shows that over the period 1990 to 2010 the value effect is significantly present in the majority of the 36 countries they investigate, and stronger in the post-1995 period than in the pre-1995 period that Fama and French (1998) analyze. Nevertheless, we take a conservative approach for the excess returns on these return factors. The reason for this is that trading costs might reduce their real-life profitability. Moreover, more institutions have incorporated these return factors into their investment process, potentially leading to a decrease in their excess returns and increased volatility in the future.

In Table 3.7 we estimate that value and momentum stocks will have an excess return of 1% per annum. We assume that both value and momentum have somewhat higher volatilities than developed equity markets. The empirical evidence for excess returns on small capitalization stocks is less convincing, leading us to estimate an excess return of 0.25% and risk of 22% for this group of stocks. For low-volatility stocks, we assume that they have the same expected returns as the market average, but at a substantially reduced risk of 13% instead of 18%. Although a debate about the increased valuation of low-volatility stocks has been heating up, we think the subsequent return impact of higher valuations is limited. As Marmer (2015) suggested, the low-volatility strategy is in a sense self-correcting with regard to valuation; overvalued stocks exhibit higher volatility and will be removed from the strategy.

Table 3.7: Long-term expected returns for equity asset classes

Long-term expected returns Asset class	Robeco		DNB	VBA / AFM	
	Return	Volatility	Max return	Return	Volatility
Developed markets	8%	18%	7%	8%	17.5%
Value stocks	9%	20%	7%	-	-
Small stocks	8.25%	22%	7%	-	-
Momentum stocks	9%	22%	7%	-	-
Low-volatility stocks	8%	13%	7%	-	-
Emerging markets	8.5%	25%	7%	8.5%	22.5%

Source: Robeco

Although we believe that the factor premiums are present in all markets, we do not separately include them for emerging and frontier equity markets in the table. There is some evidence that the factor premiums are somewhat higher in less developed markets, but trading frictions make it more expensive to exploit them. Hence, our estimation is that the relative factor returns for developed markets apply for emerging and frontier markets. For example, as value stocks have a 1%-point higher return than the market as a whole (8% versus 7%), the expected return for value stocks in emerging markets is 8.5%. This is the same 1%-point higher than the 7.5%.

Table 3.7 shows that our geometric returns are about 1%-point higher than those allowed by DNB. Our estimates are the same as those reported by VBA/AFM.

3.3 Alternatives

Here, we discuss the return perspectives for private equity, real estate, commodities and hedge funds. Since these asset classes are illiquid or by definition involve the use of derivatives, we classify these as alternatives. This implies that investors in these asset classes should usually have additional measures in place to manage the risks involved.

3.3.1 Private equity

A large number of studies have tried recently to compare the returns of private equity with those of listed equities. Kaplan and Schoar (2005) do not find an outperformance for private equity, with a public market equivalent (PME) of 0.96 for all funds. Phalippou and Gottschalg (2009) draw a comparable conclusion on a larger sample. However, Stucke (2011), using a different methodology, finds a net outperformance for the same data set as Phalippou and Gottschalg (2009). Harris, Jenkinson and Kaplan (2012) perform a meta-study using databases from Burgiss, Venture Economics (VE), Preqin and Cambridge Associates (CA). They show that for all datasets, except VE, the median buy-out fund has returned a PME of between 1.2 and 1.27. For venture capital their findings show outperformance for the 1990s and an underperformance in the 1980s and the 2000s. Robinson and Sensoy (2011) findings also demonstrate outperformance over the S&P 500 for buy-out funds over the period 1984-2010. For venture capital they document a similar performance to the S&P 500 using data from one large limited partner. These recent studies suggest that private equity may well perform better than listed equities. This would be in line with the overview of different PE studies that Diller and Wulff (2011) have provided.

In a comment on Stucke (2011), Robinson and Sensoy (2011) and Harris, Jenkinson and Kaplan (2012), and Phalippou (2012) indicate that the results from their studies are largely derived from the outperformance of small and midcap stocks relative to large caps. Moreover, most PME calculations do not take leverage, which is common in private equity,

into account. Driessen, Lin and Phalippou (2012) estimate the beta of buy-outs at 1.5. Kaplan and Schoar (2005), Higson and Stucke (2012) and Sensoy, Wang and Weisbach (2013) also note a heterogeneous pattern in the performance of private equity funds. This implies that results are strongly dependent on manager selection. Finally, Robinson and Sensoy (2011) show more capital calls than distributions during crises. Higson and Stucke (2012) also find this cyclical pattern. Diller and Kaserer (2009) find private equity returns to be positively correlated to economic growth, so negative returns come in periods when they are least desired.

Although Table 3.8 shows an outperformance for private equity over stocks in the period 1998-2013, we do not have enough evidence from existing literature that private equity returns (net of fees) exceed public equity returns. There is no consensus in the academic literature. Most studies point to private equity outperformance, but the issue of what is left after proper risk adjustment remains a question. Also, all the studies mentioned above are subject to selection and reporting biases. Hence, we assume the risk premium of private equity as a group to match that of listed equities.

Table 3.8: Estimated excess returns for private equity, real estate and hedge funds

	Excess returns		Volatility	Period
	over cash	over equities		
Private equity				
Robeco (LPX America)	4.7%	2.1%	29.8%	1998-2013
Driessen, Lin, Phalippou (2012)		-4.9%		1980-2003
Higson and Stucke (2012)		4.5%		1980-2000
Wilshire (2013)		3.0%		prospective
Real estate				
Robeco (NAREIT US)	4.2%	0.0%	17.9%	1972-2013
Fugazza, Guidolin and Nicodano (2006)	4.7%	-1.0%		1986-2005
Wilshire (2013)	0.0%	-2.5%		prospective
Hedge funds				
Robeco (HFRI FOF Composite)	3.9%	-1.6%		1990-2013
Robeco (HFRI FOF Composite)	5.7%	-1.9%		1990-2001
Robeco (HFRI FOF Composite)	1.8%	-1.2%		2002-2013

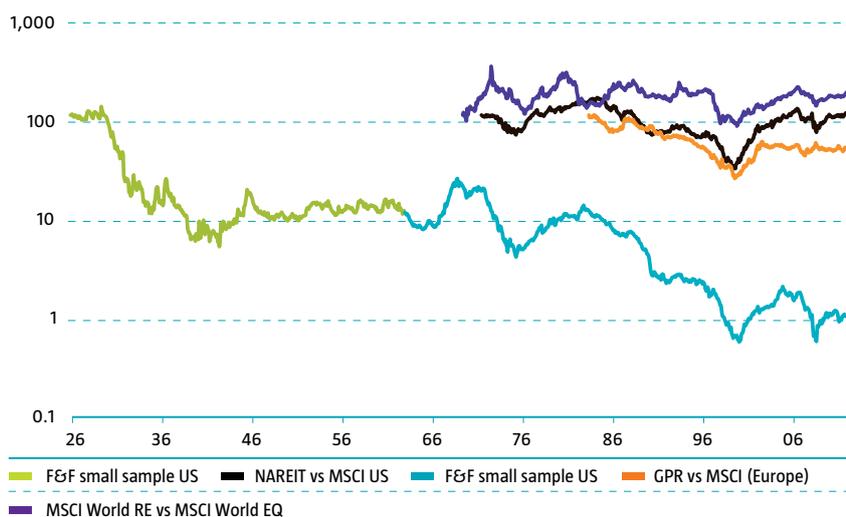
Source: Robeco

3.3.2 Real estate

In principle, we view direct and indirect real estate as one particular source of risk and return. This corresponds to Idzorek, Barad and Meier (2006), who state: "Although all investors may not yet agree that direct commercial real estate investments and indirect commercial real estate investments (REITs) provide the same risk-reward exposure to commercial real estate, a growing body of research indicates that investment returns from the two markets are either the same or nearly so." Of all alternative asset classes, real estate is the one that has probably received most attention from academics in the past. A literature review by Norman, Sirmans and Benjamin (1995) tries to summarize all the findings. Overall, they find no consensus for risk and return characteristics for real estate. However, more than half of the consulted literature in their paper reported a lower return for real estate compared to equities. Fugazza, Guidolin and Nicodano (2006) also show lower excess returns for real estate than for stocks. Their estimate of -1.0% per year can be seen in Table 3.8.

As Figure 3.4 illustrates, the relative performance of real estate versus equities differs according to the data source and region. There is a lack of long-term data with the same country allocation for real estate and equities. Even with the same country weightings, results can differ substantially. US data from the Fama and French data library paint a different picture than the NAREIT data relative to the MSCI US equity market.

Figure 3.4: Relative performance of real estate/REITs versus equities



Source: Fama and French, Thomson Financial Datastream, Robeco

We proceed with an estimated excess return for indirect real estate that is 1% lower than our estimate for stocks. Due to the lower leverage in direct real estate compared to indirect real estate, we estimate expected returns to be another 1% lower for that asset class.

3.3.3 Commodities

An unleveraged investment in commodities is a fully collateralized position which has three drivers of returns: the risk-free rate, the spot return and the roll yield. Erb and Harvey (2006) point out that the roll return has been a very important driver of commodity returns, but it is unclear what the size of roll returns will be in the future.¹² In their extensive study they find that the average individual compound excess return of commodity futures was zero. They argue that individual commodities are not homogeneous and that their high volatility and low mutual correlations result in high diversification benefits. The diversification benefit comes from periodically rebalancing the portfolio and is reflected in the high historical performance of the GSCI Index compared to the return from individual commodities.

¹² The upward (contango) or downward (backwardation) sloping term structure of futures prices creates a negative or positive roll return. It arises when an almost expiring future is rolled over to a future with a longer maturity.

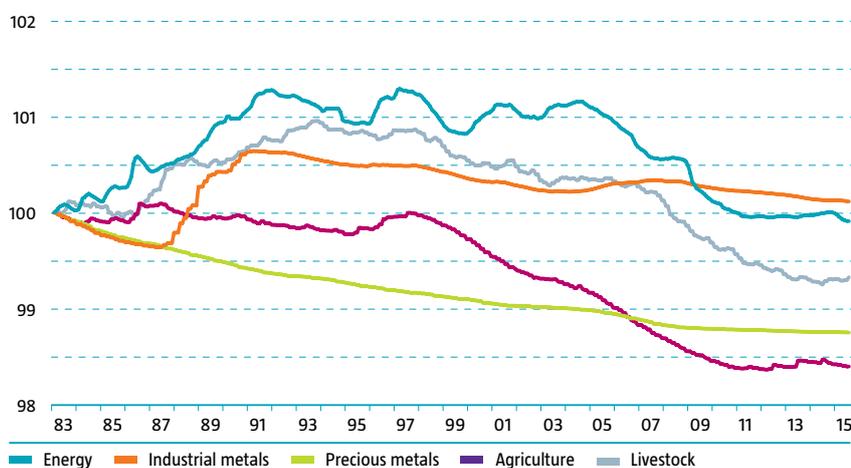
Gorton and Rouwenhorst (2006) create an equally weighted monthly rebalanced portfolio of commodity futures that had returns like stocks over the period 1959-2004. Erb and Harvey (2006) raise questions over the representativeness of both the equally weighted portfolio and the GSCI index. On the one hand, they show that an equally weighted stock index would by far outperform a market cap-weighted index. On the other hand, the GSCI index composition has changed dramatically over time and allocates heavy weights to energy commodities. They suggest that a simple extrapolation of historical commodity index returns might not be a good estimate for future returns.

We observe that the return from systematically rolling over energy-related futures has historically added substantially to the total return of commodity investing in energy and livestock until the early 1990s (see Figure 3.5). However, over roughly the past ten years, roll returns on all commodity categories have tended to be negative. Due to the increased interest of institutions in commodity investors, the future roll return is unlikely to again become positive. Lummer and Siegel (1993) and Kaplan and Lummer (1998) argue that the long-term expected return of commodities equals the return on Treasury bills. Many theories for commodity risk premiums exist, but most of those are not easily measurable.¹³

13. See Erb and Harvey (2006) for a literature overview of commodity market theories.

Since we have not found enough evidence for a large risk premium on commodities, we use a commodity risk premium that lies between those of cash and government bonds, i.e. a risk premium of 0.5% relative to cash.

Figure 3.5: Roll returns for commodities (EUR, 1983=100)



Source: Thomson Financial Datastream, Robeco

Recent research suggests there are factor premiums in commodity markets similar to those that exist in credit and equity markets. We focus on well-documented return premiums within the commodity market. The momentum and carry factor have been documented by Erb and Harvey (2006), Gorton and Rouwenhorst (2006), Miffre and Rallis (2007) and Shen, Szakmary and Sharma (2007). The low-volatility factor is in the spirit of findings by Miffre, Fuertes and Pérez (2012) and Frazzini and Pedersen (2010). Blitz and De Groot (2013) also find that the case for factor premium investing carries over to the commodity market. More specifically, they find that a commodity portfolio which simply invests equal amounts in the various factor premiums achieves a significantly higher risk-adjusted performance than a traditional commodity market portfolio, with much smaller drawdowns.

Table 3.9 shows the excess returns relative to the risk-free rate for the S&P GSCI commodity market index and the long-only momentum, carry and low-risk commodity factor portfolios over the period January 1979 to June 2012 and over the most recent ten years of this sample. See Blitz and De Groot (2013) for more information on the construction of these portfolios. Over this time period, but also over the past ten years, commodity investments were considerably more volatile than equities and earned lower returns than bonds, resulting in a relatively low risk-return ratio. However, the risk-adjusted performance of the commodity factor premiums is more attractive. The excess returns of the momentum and carry factors are substantially higher, providing up to almost 8% additional return relative

to the market over the whole sample period and up to more than 13% higher returns over the past ten years of the sample. The volatilities of the momentum and carry premiums have been in line with the market. The return of the low-risk factor is only somewhat higher than the commodity market premium; however, the volatility is significantly lower than the market volatility. All returns are in US dollars and do not include the impact of transaction costs, although these are relatively low for commodity futures (see e.g. Locke and Venkatesh (1997)).

Table 3.9: Historical data on excess returns for the long-only commodity factor premiums 1979-2012

Asset class	1979-2012		2002-2012	
	Excess return	Volatility	Excess return	Volatility
Commodity market	1.16%	19.50%	1.61%	25.13%
Momentum	8.90%	23.17%	13.56%	23.91%
Carry	7.89%	19.80%	15.09%	21.12%
Low Risk	3.75%	12.38%	6.67%	12.23%

Source: Blitz and De Groot (2013)

Although historical risk-adjusted returns have been significant, we use conservative estimates of the excess returns of these commodity factor premiums, as each of the strategies can also experience periods of negative excess returns. We also took the premiums of similar factors for equities into account, as these have existed for longer than the ‘newer’ factor premiums for commodities. We focus on generic factors in this study, while in practice less naive approaches can be used to construct the factors, such as by using more advanced portfolio construction techniques and aiming for optimal rolling returns by investing further down the curve. Table 3.10 illustrates the estimated excess returns and volatilities. We assume that returns of the momentum and carry premium are 1.5% higher than the commodity market premium, with similar volatilities as the commodity market factor. As the reported factor premiums for commodities are larger than those for equities, we have put excess returns for these commodity factor premiums relative to the commodity market 0.5% higher (at 1.5%) than the equity factor premiums relative to the equity market (1%). For low-volatility commodities, we assume similar expected returns to the market, but with a substantially reduced risk of 15% instead of 25% for the commodity market. Table 3.10 summarizes our estimates for the commodity market and the commodity factor premiums.

Table 3.10: Long-term expected returns for long-only commodity factor premiums

Asset class	Return	Volatility
Commodity market	4.0%	25%
Momentum	5.5%	25%
Carry	5.5%	25%
Low Risk	4.0%	15%

Source: Robeco

3.3.4 Hedge funds

Table 3.8 shows historical excess returns for hedge funds of funds. We use the HFRI Fund of Funds Composite Index which is net of all fees, equally weighted and includes over 600 funds. Furthermore, it is broadly diversified across different hedge fund styles. At first sight, hedge funds might show a reasonable performance with a net of fees excess return over cash of 3.9%. Since 2002, this has dropped to below 2%, though biases and the favorable equal weighting affect this figure. The academic literature contains extensive information on biases in hedge fund indices, as shown in Table 3.11. However, estimates for the market portfolio of hedge funds are scarce. Funds of hedge funds are often considered to be a good proxy for the market portfolio, since they have fewer biases than typical hedge funds. However, their returns are affected by the double counting of management fees. Fung and Hsieh (2000) estimate the portfolio management costs for a typical hedge fund of fund portfolio to be between 1.3% and 2.9%. There is no cheaper way to obtain exposure to this asset class.¹⁴

14. There are cheaper and more liquid so-called hedge fund replication strategies available for investors. We do not include these in our analysis, as they are usually dynamic strategies using derivatives on traditional asset classes.

Table 3.11: Biases in hedge fund databases

	Robeco	Magnitude	Period
Fung and Hsieh (2000)	Backfill	0.7%	1994-1998
Fung and Hsieh (2000)	Survivorship	1.4%	1994-1998
Posthuma and Van der Sluis (2003)	Backfill	2.3%	1996-2002
Amin and Kat (2005)	Survivorship	0.6%	1994-2001

Source: Robeco

Taking this all together, we believe the estimate of Bekkers, Doeswijk and Lam (2009) to be reasonable with an excess return over cash of 1.25%. Note that this is a combination of possible manager skill and also the systematic exposures that hedge funds seem to have. When we compare our expected returns in Table 3.12 to those of DNB and VBA/AFM, we see that the differences are relatively small. We tend to be more conservative where volatility is concerned. For example, for private equity we estimate 25% volatility, whereas VBA/AFM estimates 17.5%. The exception is hedge funds, for which we assume a slightly lower volatility with 10% compared to the 12.5% of VBA/AFM.

Table 3.12: Long-term expected returns on alternative asset classes and changes relative to previous edition (arrows)

Long-term expected returns	Robeco		DNB	VBA / AFM	
	Return	Volatility	Max return	Return	Volatility
Private equity	8%	25%	7.5%	8.75%	17.5%
Commodities	↓ 4%	25%	6%	6.5%	22.5%
Indirect real estate	7%	20%	7%		
Direct real estate	6%	10%	6%	6.5%	8%
Hedge funds	4.75%	10%	7.5%	7%	12.5%

Source: Robeco



SPECIAL TOPIC

Global warming: A systemic risk

The scientific consensus is that global warming will become worse, before it hopefully becomes better. One reason for optimism is the fact that heightened global concerns surrounding this phenomenon have now resulted in the ambitious Paris Agreement. Global warming also implies global 'weirding' i.e. more extreme weather events. This not only means droughts like those recently experienced in Australia where meteorologists had to search for new colors for their weather maps, or the summer wildfires of Siberia and the current drought in California. But it could also mean – somewhat paradoxically – more severe winters as a consequence of a seasonal change in the path of the so-called 'jet stream' or a southerly bend in the Gulf Stream which is currently responsible for the mild sea climate in northwest Europe. Climate change will have an impact on politics, macroeconomics and on financial markets.

Introduction

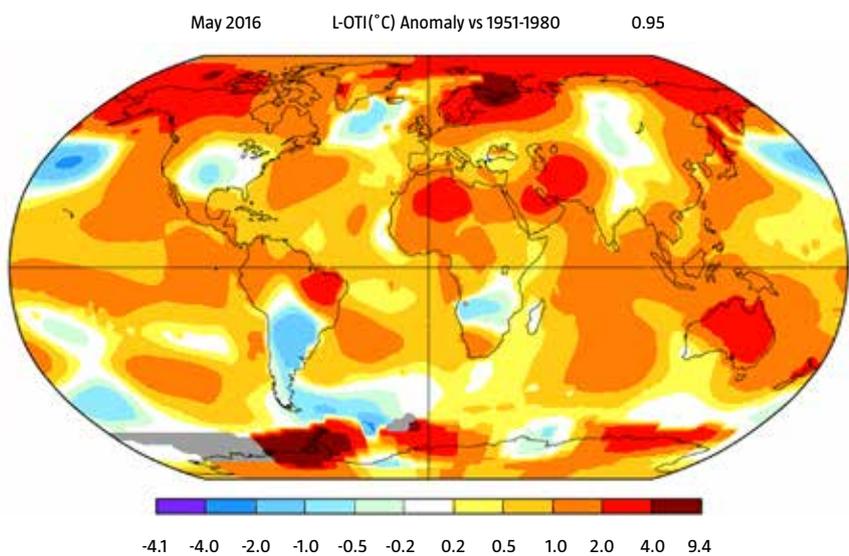
Global weirding will increasingly become a drag on the world economy. What will it mean for expected returns on asset classes? The most significant physical impacts of climate change will become evident in the second half of this century. But the consequences for forward-looking asset markets could become apparent far earlier. When future expectations in terms of climate change are adjusted, markets and prices will reflect this, possibly long before the physical changes of global warming make themselves felt. To give a brief outline of the consequences ongoing global warming will have on investors, we will firstly discuss current trends and the current scientific consensus on climate change. Secondly, we will look at the consequences for the world economy and the implications for financial markets in several different scenarios. And we'll try to end on an upbeat note after a rather alarming story.

Current developments not encouraging

Current developments have not been particularly encouraging. The latest month we have data for at the time of writing is May 2016.

'May 2016 was, like the previous seven months, the hottest on record – and the data goes back 136 years'

Figure 1: Anomaly vs 1951-1980



Source: <http://data.giss.nasa.gov/gistemp>

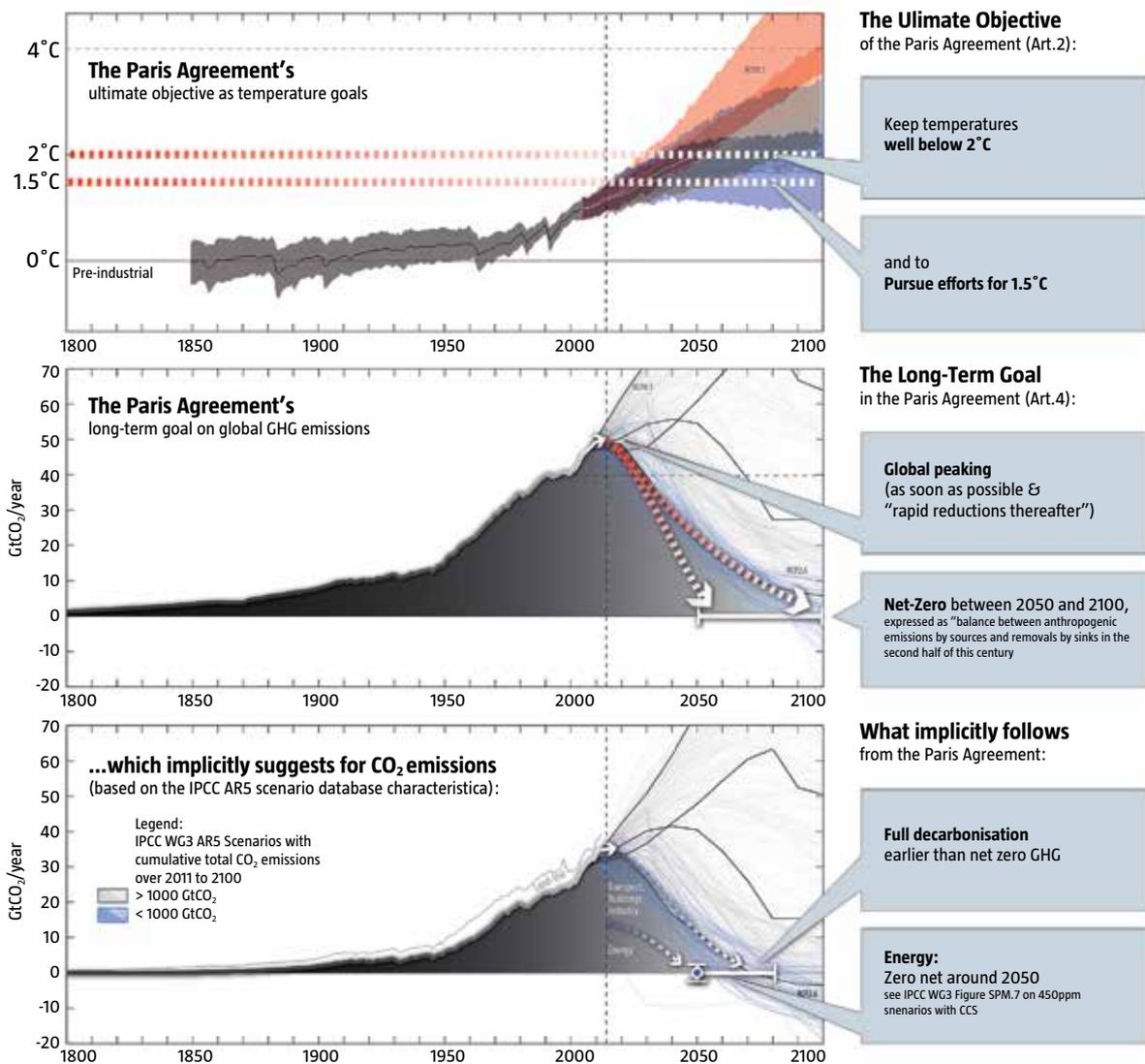
Note: Grey areas signify missing data. Ocean data are not used over land nor within 100km of a reporting land station.

According to NASA's Goddard Institute for Space Studies, May 2016 was, like the previous seven months, the hottest on record – and their data goes back 136 years. The bad news is that the current heat spike is located in the extreme northern latitudes shown on the map. This will cause more ice to melt, a longer melting season, loss of thinner ice, loss of longer-term ice, and billions of tons of fresh water to pour into the saltier ocean which can and will disrupt the Earth's ability to move that heat around. El Niño also plays a role but probably only contributes a little of this overall warming (around 0.1°C or so). Even without El Niño the world would have experienced record heat. The year 2016 will likely be warmer – perhaps much warmer – than 2015. This poses grave implications for the world's ecosystems as well as for us humans. Global temperatures are currently approaching – and may well have exceeded – the maximum temperatures commonly observed over the past 11,000 years (i.e., the period during which humans have been engaged in agriculture), and are flirting with levels not seen in more than 100,000 years.

How do these recent developments relate to the ambitions formulated in the Paris Agreement which aims to contain global warming at well below 2 degrees Celsius and to pursue efforts to limit it to 1.5°C? The Intergovernmental Panel on Climate Change (IPCC) considers a temperature increase of two degrees above pre-industrial levels as a kind of maximum, above which excessive environmental harm is to be expected. It should be noted, however, that some prominent scientists are of the opinion that the danger level is lower and are advocating a maximum of 1.5°C.

A recent study in the scientific weekly journal Nature states that the recent Paris Agreement will not be able to ensure the increase in temperature stays below 2°C. If the promised reductions in greenhouse emissions are taken into account, we are still on schedule for a median warming of 2.6-3.1°C. The study's authors conclude that the Paris Agreement requires some kind of boost.

Figure 2: The Paris Agreement



Source: M. Meinshausen, Australian-German Climate & Energy College, The University of Melbourne, climatecollege.unimelb.edu.au

It is also worth noting that the 2°C limit won't protect many of the world's poorest countries. The weakest links are already showing signs of breaking. According to a 2013 World Bank report, the Pacific Island nations are among the world's most physically and economically vulnerable places, when it comes to climate change and extreme weather events like floods, earthquakes and tropical cyclones. A striking example is Kiribati, a collection of 33 atolls and islands, currently less than two meters above sea level. In 2003 a water-management program was started consisting of coastal sea walls, planted mangroves and rainwater-harvesting systems. The first round of sea walls proved to be counterproductive and caused more erosion.

Adapting to environmental challenges is hard work, but China's successful construction of artificial islands in the South China Sea shows that it is, in principle, feasible. But it is also costly. The challenge is not so much that the place will become submerged underwater, but that it will become prohibitively expensive to live there. The Kiribati government has bought land on the neighboring Fiji Islands and is contemplating 'migration with dignity'; an option open to a country with only 110,000 people.

Macroeconomic and market impact: three scenarios

The macroeconomic impact of climate change will be heavily influenced by the environmental policies pursued. It is impossible to calculate the impact with any degree of certainty, but of course we can sketch very rough and highly stylized scenarios. We base these on a report by the University of Cambridge Institute for Sustainability Leadership.¹ The most benign scenario consists of a rapid shift from a fossil-fuel based world economy to a low-carbon one. This will demand a tremendous investment in new capital infrastructure, research and development and new business models. The shift will be costly and lead to a short-term period of high volatility and slow growth. According to HSBC, nearly half the coal and oil assets will become stranded (essentially worthless).

How could such a scenario be achieved? A combination of a global carbon tax, the introduction of carbon budgets, a hefty increase in investments in low-carbon technologies and an end to investments or subsidies for fossil-fuel extraction could do the trick. A more plausible scenario is a world where past trends basically continue, with temperatures rising by 2-2.5°C by 2100. The world will succeed in slowly reducing its dependency on fossil fuel. The flip side is that it will take longer before the positive benefits of the new low-carbon economy will start to accrue. GDP would be lower than in the first scenario. A third scenario basically consists of giving growth priority over tackling the climate risks. Initially economic growth will be rather heavily dependent on fossil fuels. Market confidence in the economy's future performance will gradually diminish as a consequence of environmental degradation, water stress, increasing resource constraints, strained production capabilities and reduced regional social cohesion.

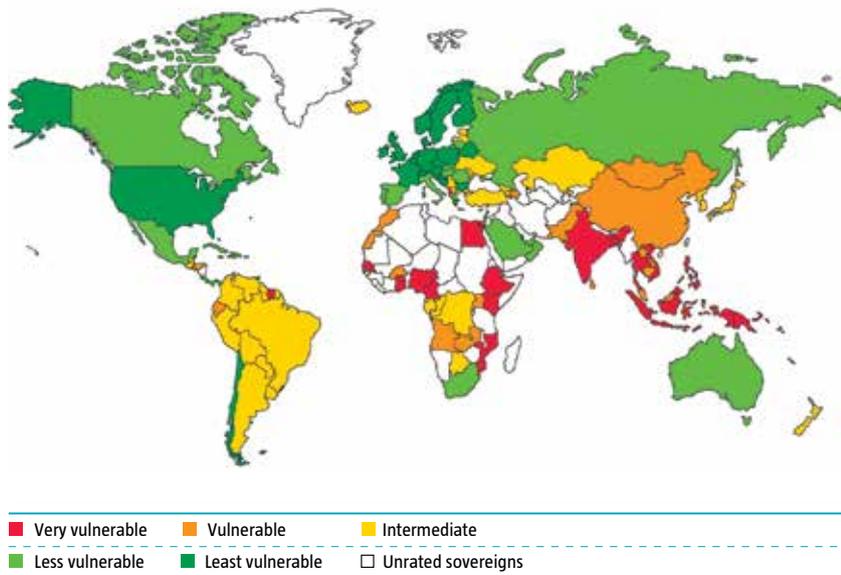
The Cambridge study looks at the performance of four portfolios in terms of their structure and in each scenario. The long-term impact of the third scenario on expected returns for risky assets is not surprisingly the worst. In the first two scenarios, the worst performing industry sectors for developed markets are real estate², followed by basic materials, construction and industrial manufacturing. The best performers are transport, agriculture and consumer retail. By switching investments from the worst performing sectors to the better ones, risk can be mitigated. But the study concludes that only just under half of the returns impacted by climate change can be hedged through cross-industry and regional diversification.

1. Unhedgeable risk: How climate change sentiment impacts investment (CISL, 2015).

2. The physical impact of climate change such as increasing sea levels, storm surges and extreme weather events will inevitably damage and destroy property.

Another important conclusion is that an investment manager wishing to hedge against the second and the third scenarios is advised to restrict his investment to fixed income in developed markets. Obviously, long-term returns are low, but downside losses are minimized. This is not surprising as a 2014 study by Standard & Poor's suggests that vulnerability to climate change is unevenly distributed across different countries, with the poorer and lower rated countries being the most vulnerable.

Figure 3: Potential vulnerability to climate change



Source: Standard & Poor's 2014

A silver lining: long-term healing of the Antarctic ozone layer

An international study published in weekly journal *Science*, suggests that the seasonal 'ozone hole' which forms over Antarctica every spring has shrunk by an area equivalent to the size of India since 2000. This improvement can be attributed to the gradual decline in the use of atmospheric chlorofluorocarbons (CFCs) as a direct result of the Montreal Protocol of 1987 (30 years ago), which committed the world to rapidly phase out CFCs. Overwhelming scientific evidence showed that CFCs destroy the ozone layer, which protects life on earth from harmful ultraviolet radiation. CFCs are powerful greenhouse gases too, which significantly contribute to the warming effect of carbon dioxide. The Montreal Protocol's success of course offers useful arguments in the fight to impose stringent limits on emissions of carbon dioxide and other greenhouse gasses, though the phasing out of fossil fuels will be much more radical and much more costly. Ironically, it was the decisive leadership of the free market enthusiasts Ronald Reagan and Margaret Thatcher that generated extensive new restrictions on industry. We have saved the planet once, so let's do it again, the *Financial Times* recently noted referring to this successful example in the fight to tackle climate change.

Conclusion

Climate change is happening and current trends are not sustainable. Fortunately, awareness of the increasing global risks is also increasing. Although the physical impact of climate change will most likely be felt in the second half of this century, financial markets could start discounting its consequences on asset returns much sooner. The most benign scenario would be one where the world undergoes a rapid switch to a low-carbon economy. Significant transition costs would dampen global growth in the first few years, but prospects for risky assets would be relatively positive after the initial pain. Unfortunately, this doesn't seem to be the most realistic scenario.

At this moment, governments do not seem to be any more willing than they were in the past to step up action on climate change. By 2100, temperatures are expected to have risen by more than 2°C. The switch to a low-carbon economy will be rather slow, which will increase the cumulative global negative impact especially after 2060. Initially, equities will take a hit. Nevertheless, as long as it looks as if the temperature rise will be contained at around the 2.5°C level as we approach 2100, the outlook for risky assets will improve after the switch towards low carbon has been made.

In a worst case scenario, the world will give priority to growth and neglect the environmental challenges. Initially, this will benefit the returns on risky investments, until eventually the idea sinks in that long-term future growth will be low due to significant environmental losses that can never be recouped. On a sectoral basis, some climate risks can be diversified away by underweighting those sectors that are at risk and overweighting others, depending of course on the scenario. Unrestricted large cap companies are expected to be better able to adapt to climate change than locally bound small caps. But it is, of course, an illusion that climate risk can be diversified away completely.

One solution to minimize the downside effects of all scenarios is to construct a fixed income portfolio concentrated in developed markets. Although the creditworthiness of some developed markets will also deteriorate due to climate change, emerging markets are the most vulnerable. Needless to say, the expected return on such investments will be small. Climate risk is one argument for remaining cautious on emerging markets as an asset class. Furthermore, in an economic environment which is overly reliant on monetary policy, the climate change global mega trend also undermines the frequently cited "there is no alternative" (to equities). As an asset class, equities are especially vulnerable to climate change.

For an economist it is tempting to describe climate change as one of the greatest market failures known to man. There is no effective price on carbon to reflect the external effects of the ever higher atmospheric concentrations of carbon emissions that increase climate risk. Moreover, these risks will largely be borne by future generations. Still, it is far too early to despair. The fact that thirty years ago effective steps were taken via an international agreement to dispel the ozone crisis, also give us hope for the future.

'It is tempting to describe climate change as one of the greatest market failures known to man'

4

Economic growth and financial markets in a steady state

Long-term economic growth stems from increasing labor productivity and changes in the potential labor force, emanating from cyclical swings in the unemployment rate. Labor productivity and labor force growth also play an important role in the earnings growth rate and thus in financial returns for investors. So we will start by discussing labor productivity and labor force growth rates and then move on to economic and earnings growth. We will conclude with the theoretical implications this will have for equity and bond returns in the long-term steady state.

4.1 Labor productivity

Labor productivity in a mature economy grows between 1.5% and 2% per year. Productivity gains can be determined by looking at the real growth in per capita gross domestic product (GDP). In the long run, this matches the increase in labor productivity, if we assume that the per capita hours worked remain constant. Apart from periods of significant unrest, the speed of productivity growth has been remarkably gradual. According to data from macroeconomist Angus Maddison covering a wider set of 20 Western countries, growth in per capita GDP averaged 1.9% in the period 1870 to 2008. Developing economies can temporarily show higher labor productivity growth rates. For example, Japan experienced an average increase of 3.8% between the end of World War II and 1980. However, as an economy matures, it is harder to realize productivity gains. For example, in the period 1980 to 2015, Japan's labor productivity increased by 1.5%, which is close to the gains of 1.6% seen in the US over this same period. Some developing countries have shown even stronger growth rates. China has enjoyed an annual productivity gain of 6.6% since 1980 and India 4.5%. In contrast, Brazil has lagged with a modest gain of just 0.8%. Barro and Ursúa (2008) estimate an average historical growth rate for developing economies of 2.8% over the period 1960-2006, 0.4% above the growth rate for mature economies over that same period. Please note that these numbers are average per capita real GDP growth rates, and that there can be significant differences between different countries.

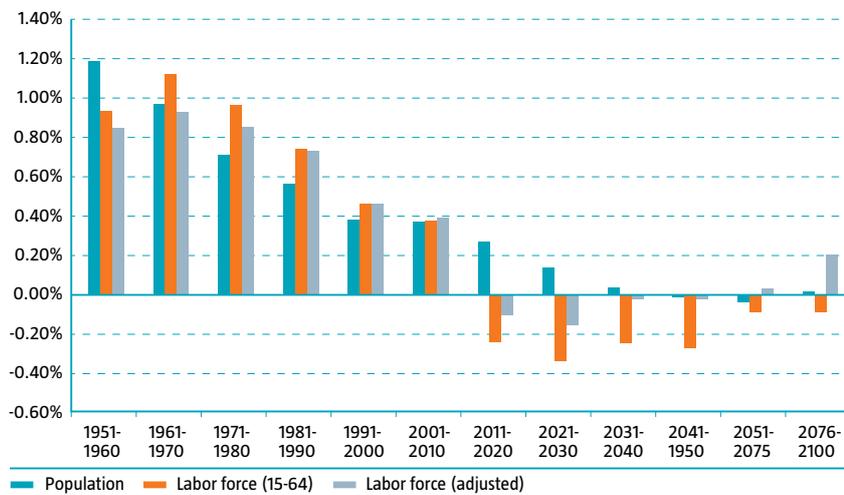
If history is a good proxy for what happens in the future, a 1.75% gain for mature economies seems to be a good starting point. Some commentators such as Robert Gordon argue that the past two centuries of economic growth could actually just be 'one big wave' of dramatic change rather than a new era of uninterrupted progress, and that the world is returning to a regime in which growth is mostly of the extensive sort. The idea that technology-led growth must either continue unabated or steadily decline, rather than ebbing and flowing, is at odds with history. Nevertheless, the last two centuries have been a 'special' period in terms of population growth. And although it is difficult to make a link between population growth and productivity, academic literature indicates a positive relationship which seems logical to us. As we argue in the next paragraph, population growth will not track the strong historical growth rates seen in the past and so we reduce the historical estimate to 1.5% for our steady state calculations.

4.2 Size of the labor force

The growth of the labor force has been an important stimulus for economic growth. Projections from the United Nations show that population growth will gradually fall from 1.2% per year in 2015 to 0.2% per year in 2100. The graph below gives a breakdown of the actual and projected population and labor-force growth in developed regions up to 2100.

In most analyses, the labor force is defined as the population aged between 15 and 64 years old. If we apply this definition, we see labor force growth projections for developed regions entering negative territory. However, we do not believe this definition is realistic. As people are expected to live longer, we can expect the retirement age to increase. For example, the life expectancy for a 65-year old living in 2015 is 19 years. For a 70-year old living in 2075 this figure is 20 years. Assuming the retirement period stays the same, it is unlikely that you will be able to retire at 65 in 2075. We assume that the retirement age will increase by 2/3 of the increase in life expectancy. Adjusting for this higher retirement age and for the number of youngsters remaining in education longer, we arrive at an adjusted labor force projection. This projection is remarkably close to 0% (see Figure 4.1)

Figure 4.1: Average population growth in developed regions



Source: United Nations & Robeco

The global labor-force growth projections will remain in positive territory. We calculate the average yearly increase to be 0.5% between 2020-2100. Much of the growth will take place in frontier markets. This global number will likely overstate the effect of population growth on financial markets as we believe we should give more weight to developed regions. For this reason, we use 0.25% as an estimate for labor-force growth in our further analysis.

4.3 Economic growth, earnings growth and dividend growth

Based on a productivity growth of 1.5% and a labor force growth of 0.25%, we end up with a steady state growth rate of 1.75% for the world economy. The question is, how much of this growth will be translated into shareholder returns in the steady state scenario. Much depends on the assumptions we make on the level of dilution that occurs at the various stages of transition between economic growth, earnings growth and actual returns.

The first form of dilution takes place at the earnings level and occurs right across the whole economy. Earnings are diluted in the form of taxes, reducing the potential growth for shareholders. Looking at the economy as a whole, you can present this as a transfer from the profit to the non-profit part of the economy. As we are looking at the returns in a steady state environment, it seems logical to assume that the net earnings growth will be equal to the growth of the underlying economy. If this does not prove to be the case, it means either that earnings are becoming a dominant factor for the economy as a whole (if net earnings growth is consistently above economic growth), or that they have diminished to nothing. The notion that net earnings growth should equal economic growth is the central assumption taken in the literature.

The more relevant question here is: how much of the economy’s earnings growth is linked to listed companies, as these form the basis for shareholders’ returns. It stands to reason that the earnings growth available to shareholders in listed companies will be lower than that for non-listed companies. One reason is that listed companies are skewed towards the older, less dynamic parts of the economy. The rapid start-up growth seen in new industries mostly takes place outside the listed arena. More importantly, however, established listed companies issue new shares on a regular basis (either to finance acquisitions, or as part of payments schemes), which dilutes existing shareholders’ claim to the earnings growth. This is the second stage of dilution.

So how is it possible that earnings growth for the economy as a whole is structurally higher than it is for listed companies? Doesn't this imply that listed companies are gradually being marginalized? This would be true if the split between listed and not-listed companies remained static, but of course this is not the case: successful companies normally eventually opt for a listing. Having missed out on the first high-growth phase, equity investors will only be able to tap into this new growth potential by rebalancing their portfolios.

One final point to address relates to the earnings and growth measures we should compare. As we are interested to see how much GDP growth will ultimately feed through to the equity investor, the logical measure for earnings would be earnings (or dividends) per share, as this takes new share issuance into account and adjusts for the changing composition of the general stock market. For the growth measure, real GDP seems to be a better option than per capita GDP: equity investors are not interested in what the direct source of growth is, but in the level of that growth. Most people seem to compare per capita GDP with earnings per share. But this seems to imply a link between 'capita' and 'share' which we find difficult to see. So we stick to a comparison between real GDP growth and earnings (or dividends) per share.

So how big is this dilution effect? Literature on this subject is relatively scarce, but the most direct study was carried out by Bernstein and Arnott (2003). They find the dilution factor to be as high as 80% for the period 1900-2000, based on data on dividend growth versus real growth. To be more specific: equity investors only get 20% of the underlying earnings growth seen in the economy. We do not think that this is a realistic conclusion. For one, dividend payout ratios are far from static. Fundamental shifts in these and reforms in terms of tax treatment can lead to structural changes in the absolute and relative distribution to investors. A decline in the payout ratio (as seen in the US) will result in lower dividend growth, which is not related to dilution. Looking at data from the Shiller database, for example, the dividend payout ratio for US stocks had steadily declined from around 80% in the late 19th century to less than 40% at the start of the current century. Clearly this has an impact on the dividend growth calculations. In recent years, a preference for increased payouts to shareholders seems to indicate a reversal in this trend. We also have difficulty reproducing the numbers given for the US. According to the Shiller database, real dividends per share have risen by 1.3% annually, not the 0.6% Bernstein and Arnott present in their paper. Although this 1.3% is still way below the real GDP growth of 3.3%, if we were to adjust for the structural decline in the payout ratio, we would arrive at dividend growth of around 2.5%. Unfortunately, we have not been able to analyze other countries using another dataset from a different source to compare the outcome with the results of the Bernstein and Arnott study.

We have carried out an equity dilution analysis for the period 1871 to 2015 with earnings and dividend data from Robert Shiller's website and economic growth data from MeasuringWorth. Table 4.1 shows the compounded growth rates. Based on the US data, we find a dilution factor of 50% compared to GDP growth. This is in line with research carried out by Brightman (2012), who states that "Half of the growth in total corporate earnings flows to new investors through the formation of new companies and new share issuance by existing companies". This means that we expect earnings for equity investors to rise between 0.75% to 1% in the steady state.

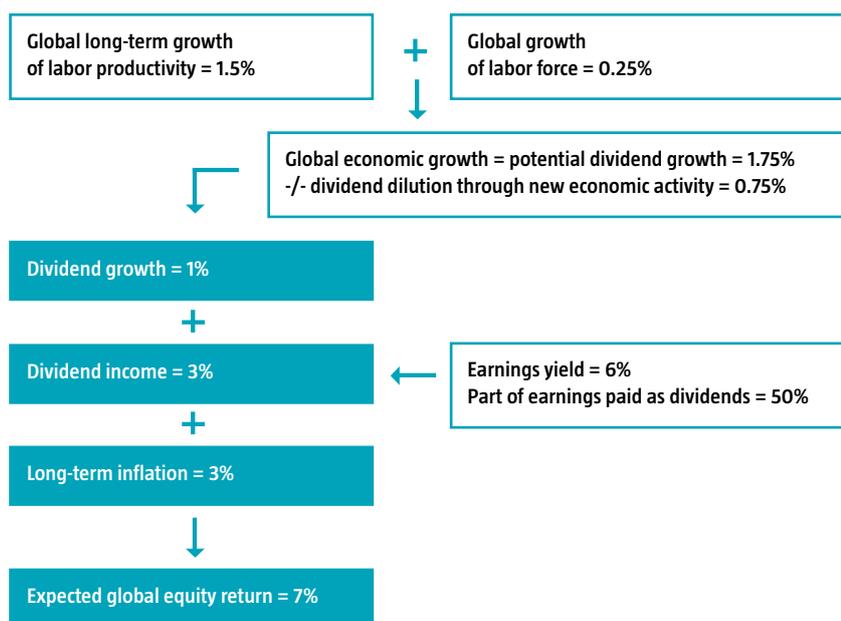
Table 4.1: Dilution of earnings per share (EPS) and dividends per share (DPS) in the United States

Period	Source	Real			Dilution	
		GDP	EPS	DPS	EPS	DPS
1900-2000	Robeco	3.3%	1.6%	1.3%	-52%	-60%
1871-2015	Robeco	3.4%	1.7%	1.5%	-50%	-55%
1900-2000	Bernstein and Arnott (2003)	3.3%	-	0.6%	-	-80%

Source: MeasuringWorth, Shiller & Robeco

Figure 4.2 presents a schematic overview of the theoretical building blocks for global equity returns. The components are derived from the growth model developed by Gordon (1959), in which the expected equity returns are split between dividend income and capital appreciation. As we assume no valuation changes in this steady state equilibrium (meaning no structural P/E increases or decreases), the capital appreciation should be equal to the real diluted earnings growth we calculated at the end of the previous paragraph (P. growth = E. growth).

Figure 4.2: Schematic overview of the theoretical building blocks for global equity returns



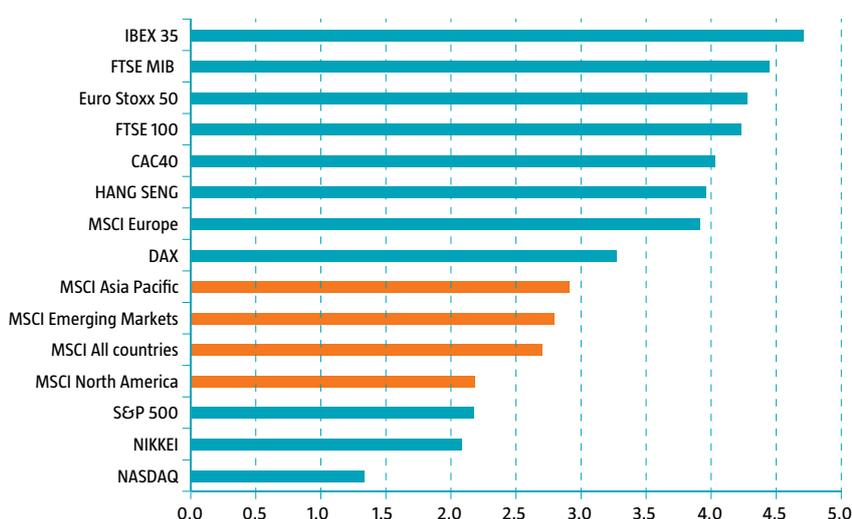
Source: Robeco

This brings us to the second element of real returns: what is the equilibrium dividend yield we can expect in the steady state? As it turns out, this is a key question, as numerous reports underscore the importance of dividends in determining total return. Looking at Shiller’s data, for example, the average (median) dividend yield for the US market over the period 1871 to 2015 was 4.4% (4.3%), comprising roughly two thirds of the real total return of 6.8% over that period. Although this sounds high, when compared with other areas of the world, the US is actually at the lower end of the scale. Dimson, Marsh and Staunton (2006) present a table with dividend yields for sixteen countries for the period 1900-2005. This shows that the geometrical mean for the whole sample was 4.5%, compared to a total real excess return over cash of 5.0%. This figure is to a certain extent misleading as it is

an average, where a country like Belgium has the same weight as one like the US. Still, there is no denying that dividend yields have played an important if not dominant role in determining the overall level of returns.

Looking at current dividend yield levels, it is clear that there is a wide dispersion between the various markets. Figure 4.3 shows the breakdown of the current dividend yield, based on the actual dividends of the past four quarters. The dividend yield varies from as low as 2.0% (Japan) to as high as 4.6% (Spain). These deviations reflect a combination of relative stock valuations (the US markets are currently more expensively priced, leading to a lower dividend yield) and regional preferences and tax rules concerning the treatment of dividends versus stock buybacks. If we take the MSCI All Countries Index (including emerging markets) as a benchmark, it is clear that the current dividend yield of 2.6% is lower than the aforementioned historical dividend yield of 4.5%.

Figure 4.3: Current dividend yield, based on actual dividend payments over the past four quarters (in %)



Source: Robeco, Bloomberg

We should, however, stress that we are not interested in current dividend yield levels, but in those that it would be reasonable to expect in the steady state. As we mentioned earlier, the steady state is the situation where stock valuations are not expected to change, which implies a neutral valuation. When looking at the current dividend yield, we should adjust for the fact that US stocks are somewhat expensive. Although this would lead to an adjustment in the various regional 'equilibrium' dividend yields (US overpriced and Europe relatively cheap at present), it would not change the outcome for the MSCI World dividend yield, as the broader asset class is currently trading at neutral levels. This means the current dividend yield of 2.7% can be used as a yardstick.

Another way to assess steady state dividend yields is to look at the payout ratio (D/E; the percentage of earnings that is being paid out in the form of dividends) and the earnings yield (E/P; the reversal of the P/E ratio). If you multiply these two yields you get the dividend yield (D/P). Looking at the Shiller database, the average payout rate has been 61%, while the median reached 58%. It is clear that these numbers have been inflated by the very high payout ratios in the first half of the period: if we look at the period after World

War II, the average and median are 51%. This appears to be more in line with other periods, with average and median dividend payout ratios of 47% for the MSCI World since 1970. The average earnings yield for the US since 1871 is 7.4% and the median is 6.8%. Again, these numbers have been positively impacted by the first half of the sample: looking at the postwar period, the average (7.0%) and median (6.0%) earnings yields are much more in line with the longer-term averages we see for the world as a whole: since 1970 these figures for the MSCI World have been 6.5% and 5.9% respectively. Based on these observations we end up with an equilibrium dividend yield of 3 to 3.5%. If we combine this with the earlier 'neutrally priced' dividend yields, we feel that a dividend yield of 3% is a prudent longer-term assumption.

It is easy now to derive the real return on equities. We add the dividend yield of 3.0% and the dividend growth rate of 0.75 to 1% to arrive at a real return of close to 4% for global equities.

4.4 Economic growth and interest rates

The nominal interest rate can best be seen as the sum of the real interest rate and the expected rate of inflation (Fisher 1930). Academic literature provides a link between economic growth and real interest rates (Ramsey 1928). Cornell (2012) describes a model that gives the expected risk-free interest rate as a function of time preference, per capita consumption growth, aggregate risk aversion, and the volatility of per capita consumption growth. Generally, higher economic growth is expected to lead to higher interest rates and vice versa. For example, assuming that higher economic growth leads to higher future income and hence higher future consumption, a higher interest rate will be required to delay household consumption. If not, households will consume more today by borrowing against expected future growth. To expand this example slightly, if expected growth is uncertain or households are risk averse, one would expect them to be more cautious about increasing consumption today, which would lead to lower rates.

Rachel and Smith of the Bank of England (2015) provide a number of arguments for today's low interest rate environment. Most of these arguments can be incorporated into Cornell's model. For example, demographic changes have shifted weight from starters to employees closer to retirement in most developed countries. This has three effects. First, consumption growth is expected to decline as these employees have already experienced their biggest real income increases in an earlier phase of their career; second, there will be more need for consumption smoothing as retirement comes closer (i.e. time preference changes) and finally risk aversion is expected to rise as people get older. All these factors lead to lower interest rates. It should be noted that interest rates can rise again when the number of elderly increases and the uncertainty about future consumption growth diminishes as income (i.e. pension) becomes more certain.

For our steady state estimate for nominal interest rates we need to look beyond today's market to establish what the expected rate will be in a world in equilibrium. Following Cornell's model, we first look at the historical compensation investors have demanded from real GDP growth (assuming this translates into consumption growth). We calculate the historical compensation to be 90% of real per capita GDP growth for developed markets. This implies that the expected real GDP per capita growth of 1.5% leads to a real return on bonds close to 1.35%. We believe this estimate to be a good indication for future compensation with one exception. The compensation is calculated using a dataset which is not in line with forward-looking demographics (see for example United Nations (2015)). Rachel and Smith (2015) calculated that changing demographics would have a severe impact on real rates, causing them to fall significantly. In looking to the future, we believe

this correction to be too high as the number of elderly will increase substantially leading to higher interest rates. Depending on longevity and retirement age trends, the earlier correction could reverse. However, we do not believe there will be a complete reversal and so we incorporate a small correction to the historical estimates leading to a real return of 1.25% (i.e. 80% capture of real per capita GDP). This lower figure is also consistent with our belief that there is a relatively lower risk associated with investing in government bonds, than in investing in the growth of the real economy. Hence, there is a safety discount for investing in government bonds.

A real return of 4% for equities and 1.25% for government bonds, means that we expect a steady state excess return of 2.75%, which is at odds with the historically observed excess return of 3.5% (see Table 3.5). It should be kept in mind though that this historical excess return figure is at least partly due to the fact that equities became more expensive during the period in question. From a steady state perspective, we do not expect this price increase to be repeated and it might in fact be reversed. This will lead to a lower excess return on equities in our steady state scenario.

4.5 Inflation

Most economic theories take a real (i.e. inflation-adjusted) perspective on economic growth. Money is often seen as a unit which reflects the prices of goods, but which carries no information in itself. There appears to be a growing consensus among central banks that 2.0% is an optimal level of consumer price inflation and that this target is not symmetrical. Deflation is generally considered to be a more serious threat that has to be prevented at all costs. This suggests a bias towards maintaining a somewhat loose monetary policy in a bid to err on the side of caution as illustrated by current circumstances. Representatives of the International Monetary Fund have even advocated an inflation target of 4.0%. All in all, we expect policymakers in a steady state environment to actually have a preference for a higher level of inflation than the stated target of below but close to 2.0%. We should also take into account the fact that an inflation overshoot in one year, will almost certainly not be compensated by attempting an undershoot in later years, as this would increase deflationary risks. Finally, policy preferences have clearly shifted towards growth enhancement, even at the cost of somewhat higher inflation (as has been the experience in emerging markets). All in all, in our opinion, an inflation estimate in line with the empirically observed 3.0% is not a bad one. This empirical analysis is described further in Chapter 2.1.

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