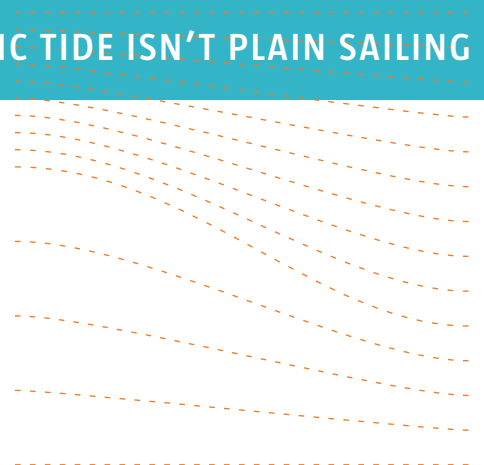




Expected Returns 2015-2019

THE RISING ECONOMIC TIDE ISN'T PLAIN SAILING



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Executive summary

“The future is like a corridor into which we can see only by the light coming from behind.” This quote sums up the hazardous nature of the exercise to try and tell what the future will bring, certainly with respect to the world economy and asset returns. All we have to go by is what we have seen in the past. So this outlook is as much a story about the past, as it is for the future: we assume that the long-term returns that we have seen in the past will - under normal circumstances - be a good guideline for the future. Interestingly, the further we try to look into the future, decades out, the more we tend to assume that the returns we have seen over the past hundred years will be more or less repeated. The shorter the outlook –and with short in this context we refer to the five-year outlook being presented here– the more emphasis will be put on recent history.

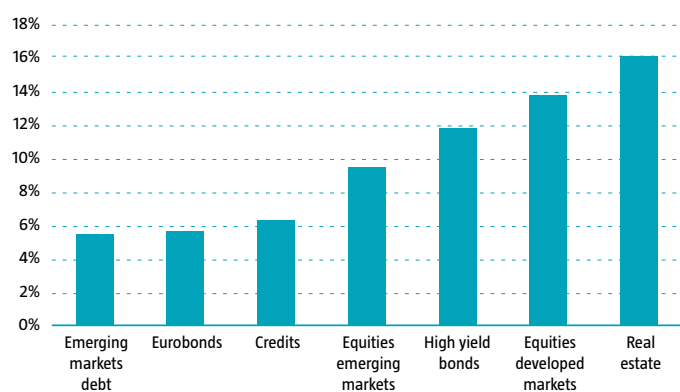
A fair question is why we should expect to see similar long-term, steady-state returns, even though the past hundred years can in no way be compared to the hundred to come. The simple answer is that the past hundred years have seen enough turmoil and volatility to be considered a good sample of possible hurdles that we will face in the next hundred years: wars, (hyper)inflation, natural disasters, booms, busts and financial crises - we have had our share of turbulence. Yet underlying all this is our conviction, which stems from our belief in the ingenuity of human beings, that we will realize equivalent returns. We believe that mankind will continue to overcome complex and threatening situations. We trust that the drive of innovation and productivity gains will persist. Certainly, there will be setbacks as there have been in the past, but generally we believe that growth, and with it returns on financial assets, will continue more or less as before.

Setting the stage

However, that describes the long run. In the short term, five years out, returns must be seen in the context of the current state of the world economy, i.e. the developments we have seen over the past five years or so. From an investor’s perspective, the past five years have been

pretty impressive, not least helped by the fact that world equity markets troughed five and a half years ago. All of the major asset categories yielded returns (well) in excess of their longer-term average, with listed real estate leading the pack, boasting a 16% annualized return.

Figure 1: Past five-year returns have been solid



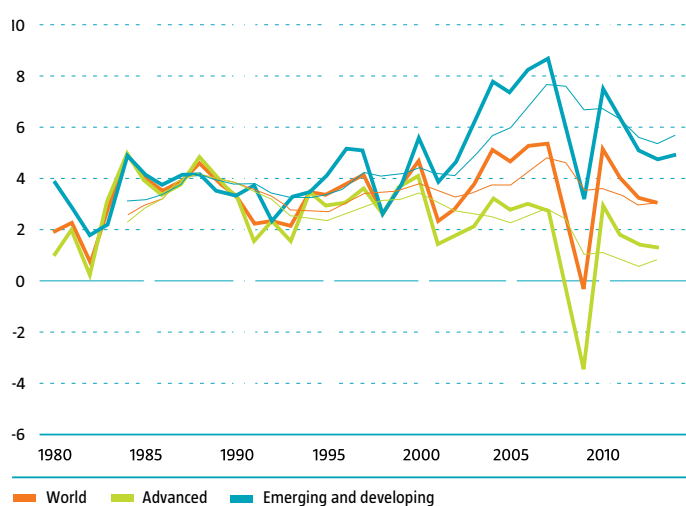
Source: Bloomberg. 5-year annualized returns September 2009 – September 2014

From an economic perspective however, the developments have been a lot less impressive. The world economy as a whole managed to keep up its average growth rate, but this was mainly thanks to the very strong growth performance of the developing countries. Growth in the advanced economies has been lagging. There has been no strong rebound from the major blow dealt during the 2008-2009 recession, with Europe especially only showing lackluster growth. As we have learned from Reinhart & Rogoff’s book “This time is different” published in 2009, recoveries following a financial crisis are weak, the current one being no exception to the rule. It has pushed central banks around the world to keep interest rates close to zero, while trying to revive the economy by embarking on various unconventional monetary measures, all aimed at flooding the

A new pope: 8-year timeline



Figure 2 Growth in the industrialized world has been below par



Source: IMF. Thin lines are five-year averages.

system with ample liquidity. This has been the driving force for the returns we have seen in the various asset classes. Liquidity has pushed interest rates and bond yields to unprecedented lows, forcing investors to look for returns elsewhere. Valuations in the different asset categories have been pushed to stretched levels. This will have a marked effect on expected returns for years to come.

Expected Returns 2015-2019: the rising economic tide isn't plain sailing

This brings us to the outlook. As usual, we take a three-scenario approach. Our central scenario, to which we attach a 60% chance, is called Gradual Normalisation. The central idea here is that hangovers will eventually lift, even those from a financial crisis. Given the fact that the subprime mortgage crisis in the US (2007-2009) erupted earlier than the Eurozone crisis (2010-2012), it is not surprising that the US will take the lead in this

process. Policy rates will be raised, although policy makers are expected to choose for a gradual approach, rather than to be too aggressive. Growth will be supported by a recovery in the labor markets and investments, but at the same time will be held back by demographics and (especially for Europe) the slow healing process of a recovering banking sector. Inflation in this scenario will rise, but is not likely to pose a threat for financial markets.

Although this is an optimistic economic scenario, we stress that this will not automatically lead to good investment returns. As indicated, the strong investment returns seen over the past five years have pushed valuations for almost all of the asset classes to stretched levels. Valuation itself is of course never a good reason to sell an asset. Misvaluation can persist for years, especially if central banks are actively pursuing policies to support it, as is currently the case in the bond markets. It is this fact that makes the sailing difficult. However, on a time horizon of five years, valuation does play an important role, especially if we are expecting things to return to normal. Moving from a bond yield of 1% to a more normal level of 3.0% will naturally result in depressed returns, as low coupons do not offer much protection against adverse price-level adjustments. As for stocks, the continued strong rally in recent years has not been matched with earnings growth, leading to stretched valuations (overvaluation) for the asset class as a whole. However, strengthening economic growth and low inflation create a more favorable environment for stocks compared to bonds. Nevertheless, we expect returns to be lower than the previous five-year outlook indicated. On an absolute basis, the returns for stocks are forecast to be muted (5.5%). However, in relative terms, as an excess return over government bonds, stocks are still expected to yield above-average returns. Within stocks, as a result of their extended underperformance, the emerging markets look the most interesting option, as valuation versus developed markets is now low. Low can be low for a reason, of course, so it should be noted that volatility for this asset class—even though it has declined in recent years—is also traditionally higher.

Table 1: Expected returns 2015-2019, and changes in five year expected returns

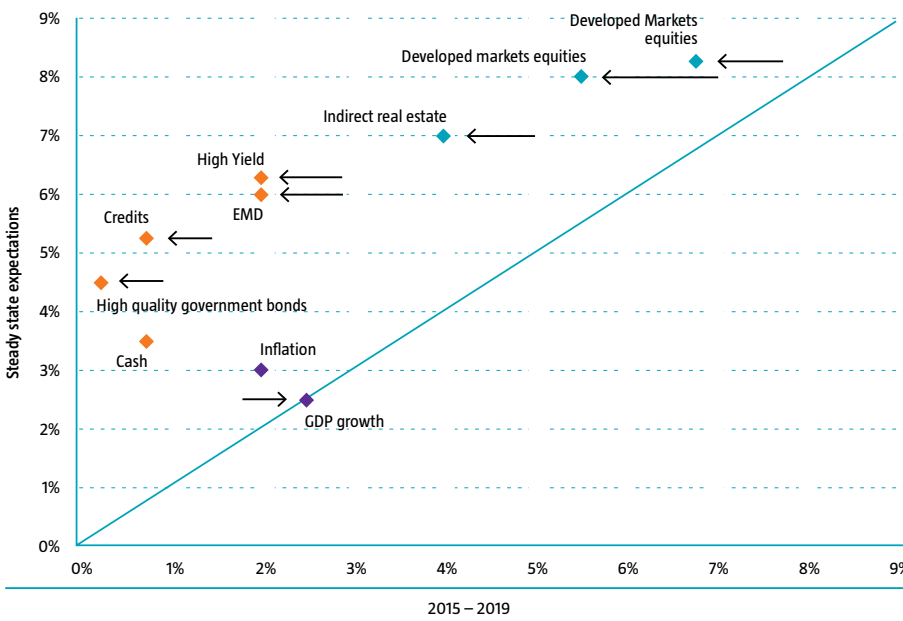
Bonds	Returns	Medium term influences*		Returns	Returns	Risk
	Long term	Macro	Valuation	2015-2019	2014-2018	Volatility
High-quality government bonds*	4½%	-/-	-/-	↓ ¼%	½%	5%
Cash or money markets	3½%	+	-/-	¾%	¾%	3%
Investment grade credit bonds	5¼%	=	-/-	↓ ¾%	1½%	6%
High-yield bonds	6¼%	=	=	↓ 2%	3½%	12%
Emerging markets debt	6%	=	=	↓ 2%	3½%	10%
Equity & Return						
Developed markets*	8%	=	-/-	↓ 5½%	6¼%	18%
Emerging markets	8½%	=	+	↓ 6¼%	7¼%	25%
Commodities	4%	=	=	↓ 1½%**	4%	25%
Indirect real estate*	7%	-/-	-/-	↓ 4%	5¼%	20%

* Medium-term influences within asset classes are relative to high-quality government Eurozone bonds and developed equities. Real estate is relative to equities.

** The reduced figure is also due to a change in the methodology used to estimate commodity returns.

Source: Robeco

Figure 3: The rising economic tide isn't plain sailing



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

Alternative scenarios

We supplement the central scenario with two alternatives: an optimistic and an adverse scenario. We do not think that these are equally likely to occur. We consider the negative 'Secular Stagnation' eventuality to be more likely (30%) than that of 'Strong Recovery' (10%).

Secular Stagnation implies that the world will continue on the path we have seen over the past five years, with modest growth for the world economy as a whole and no-growth/mild deflation in the Eurozone. In this scenario, the weight of aging and the lack of meaningful technological change that helps the whole of the economy (rather than the lucky few), prevents growth from moving into a higher gear. 'Abenomics' fails, China weakens. Bonds and real estate are the relative winners in this scenario, as monetary authorities will continue to push yields lower in the hope of reviving the ailing economies.

A happier outcome for the world economy as a whole would be the 'Strong Recovery' scenario. Investments are thriving, productivity gains translate into higher earnings, and economic growth is gathering strength globally. This scenario is not without its own drawbacks, as inflation will – finally – return to haunt central banks and investors alike. So, with the exception of cash, most asset classes will end up with a lower return compared to our central scenario. Higher refinancing rates and higher wages will pressure earnings margins, while bonds suffer a sell-off across the board.

Lukas Daalder, Chief Investment Officer Investment Solutions
September 2014

www.robeco.com

Table 2: Alternative scenarios

	Gradual Normalisation	Secular Stagnation	Strong Recovery
odds:	60%	30%	10%
Cash	0.75%	↓	↑↑
Government bonds	0.25%	↑↑	↓↓
Credits	0.75%	=	↓
High yield bonds	2.00%	↓↓	↓↓
Emerging markets debt	2.00%	↓↓	↓
Equities developed markets	5.50%	↓↓	↓
Equities emerging markets	6.75%	↓↓	↓
Indirect real estate	4.00%	↓↓	↓

(arrows show differences versus the central scenario)

1. Expected returns 2015-2019

Writing an outlook on the five-year expected returns is something that can only be done properly with knowledge of the longer-term returns that can be expected from the various asset classes. These 'steady-state' returns form the backdrop against which our five-year outlook is set. Steady-state returns are those we can expect to earn starting out from a state of equilibrium. However, as demonstrated by economies that follow business cycles and financial markets that deviate substantially from what can be considered equilibrium level, the real world is never in such a state of balance.

These are exactly the factors we take into account when determining the extent to which returns will deviate from their longer-term average: valuation and the macroeconomic environment. It is clear that an asset that is hugely overvalued is likely to generate below-average returns, just as it is clear that returns will be different in a scenario with a booming economy against one that is stagnating.

Given that the long-term, steady-state outlook remains unchanged this year, this section, though important, has been moved to Chapter 3. The steady-state results have been incorporated into the table on the next page.

In Chapter 2, we start with the presentation of expected returns for the next five years. We do this by first looking at the current valuation of the different asset classes. For each asset class, we assess whether valuations are currently in or out of line with 'normal' levels. Second, we look at the state of the world economy and determine the way in which the economic outlook for the next five years will impact returns. In our central scenario, 'Gradual Normalization', we present a fairly optimistic result, with growth gradually returning to normal. In addition, we look at two alternative scenarios, 'Secular Stagnation' and 'Strong Growth Recovery'.

Our combined approach of applying macro and valuation tilts to our steady-state returns leads to estimates of returns for the coming five years. This set of expected returns can, in our view, be used for strategic asset-allocation decisions.

Table 1 summarizes our outlook for 2015-2019. In the first column we show the steady-state, longer-term returns for each asset class presented in Chapter 3. Second, we include a column that shows the effect of the current macroeconomic conditions on the return of an asset class over the next five years: the macro tilt. These are the macro tilts in our base-case scenario. The third column shows the impact of the valuation on the return for an asset class: the valuation tilt. In the remainder of this

chapter we discuss the underlying framework for this table in more detail. We start the chapter with valuation, as this depicts the current state of pricing of the market, which is independent from our five-year economic scenarios. We continue with our three macroeconomic scenarios, leading up to our macroeconomic view for the period 2015-2019, and our macro-based outlook for asset classes within each scenario.

Table 1: Expected returns 2015-2019, and changes in five year expected returns (arrows)

	Returns		Medium term influences*		Returns	Returns	Risk
	Long term	Macro	Valuation	2015-2019	2014-2018	Volatility	
Consumer prices							
Inflation	3%	=		↓ 1¼%	2%		
Bonds							
High-quality government bonds*	4½%	-/-	-/-	↓ ¼%	½%	5%	
Cash or money markets	3½%	+	-/-	¾%	¾%	3%	
Inflation-linked gov bonds	4¼%	+	=	↓ ½%	¾%	6%	
Investment grade credit bonds	5¼%	=	-/-	↓ ¾%	1½%	6%	
Low volatility inv grade credit bonds	5¼%			↓ ¾%	1½%	4%	
Emerging markets debt	6%	=	=	↓ 2%	3½%	10%	
High-yield bonds	6¼%	=	=	↓ 2%	3½%	12%	
Equity							
Developed markets*	8%	=	-/-	↓ 5½%	6¾%	18%	
Small stocks	8¼%			5¾%	7%	22%	
Value stocks	9%			6½%	7¾%	20%	
Momentum stocks	9%			6½%	7¾%	22%	
Low volatility stocks	8%			5½%	6¾%	13%	
Emerging markets	8½%	=	+	↓ 6¾%	7¾%	25%	
Alternatives							
Private equity	8%	-/-		↓ 5½%	6¾%	25%	
Commodities	4%	=	=	↓ 1½%**	4%	25%	
Carry commodities	5½%			↓ 3%	5½%	25%	
Momentum commodities	5½%			↓ 3%	5½%	25%	
Low volatility commodities	4%			↓ 1½%	4%	15%	
Indirect real estate*	7%	-/-	-/-	↓ 4%	5¼%	20%	
Direct real estate*	6%	-/-	-/-	↓ 3%	4¼%	10%	
Hedge funds	4¾%			↓ 1¾%	4¾%	10%	

* Medium-term influences within asset classes are relative to high-quality Eurozone government bonds and 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 reduced figure is also due to a change in the methodology used to estimate commodity returns.
Source: Robeco

1.1 Valuation

In this section, we estimate the valuation of each asset class. This is primarily based on fundamental valuation, but we also take long-term mean reversion into account. Although valuation is not a timing factor with regard to short-term returns, we found it to be a relevant factor for medium to longer term returns. However, the -sometimes impressive- predictive power of in-sample historical analysis for expected future returns should not be overstated by expecting those historical results to easily generate out-of-sample returns. 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”.

We think the valuation of assets will be important in the current environment, as unconventional monetary policy has inflated asset prices over the past five years and could continue to do so. At the same time, elevated valuations make the search for future returns harder. The need for returns will push investors further out on the risk curve to reach for (remaining) excess returns above low bond yields. Although high valuations can be sustained for a prolonged period of time, as in Japan in the 50s and 60s, the more stretched valuations become, the stronger the gravity pull towards fair value and the lower these expected excess returns eventually become.

1.1.1 Government bonds

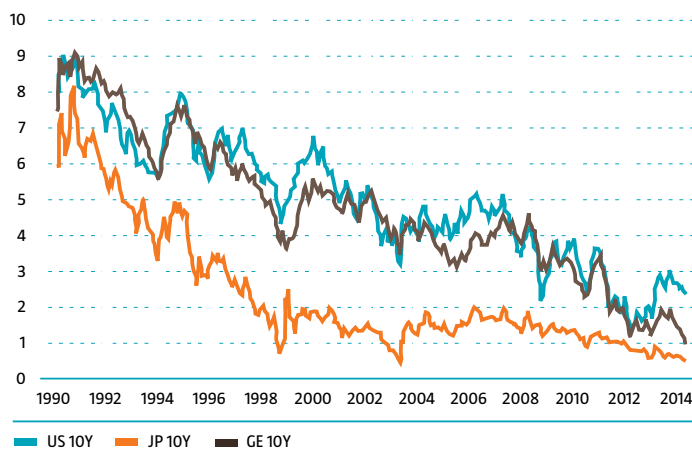
Loose monetary policies have lowered interest rates to exceptionally low levels in the US and Eurozone. We expect central banks around the world to leave excess liquidity in the financial system as the recovery continues. For central banks in different regions, we expect more divergence in their monetary policy stance. The US and, to a lesser extent, the UK are leading the global economic cycle. The Eurozone –still recovering from its financial crisis in 2010-2012– is lagging in the monetary-tightening cycle.

A rule of thumb for high-quality government bonds is that longer-term interest rates should be close to the nominal growth potential of the economy. With an average expected global inflation rate of around 2% in the years ahead and economic growth of 2.0-3.0%, depending on the region, it is not that hard to argue that further normalization will result in higher interest rates.

As we take the explicit view of a Eurozone-based investor, we concentrate on the valuation of 10-year Eurozone bonds. Based on our forecast of 2% real growth rate and 1.75% inflation, and taking into account a safety discount of around 0.25%, under normal circumstances bond rates could be expected to be around 3.5%. The safety discount is justified, as investing in government bonds is historically less risky than investing in economic growth.

This is roughly confirmed by a fair-value model of the 5Y forward rate and 10Y German bond yield, which produces 3.72%. This model incorporates variables which capture growth, inflation and systemic risks in the Eurozone. However, despite this confirmation, we see sufficient arguments to opt for a lower 5Y forward rate of 3.0% for 10Y Eurozone

Figure 1: Bond markets have continued to rally



Source: Bloomberg, Robeco

bonds, which we will discuss in our macro-tilts section on government bonds (Section 1.3.2).

From a valuation point of view, if we compare the 3.5% equilibrium level, or even our lower 3.0% estimate based on our macro tilt, it is clear that both are clearly in excess of the levels we see in the forward curve (2.4% at the time of writing). Government bonds therefore are expensive from a valuation perspective.

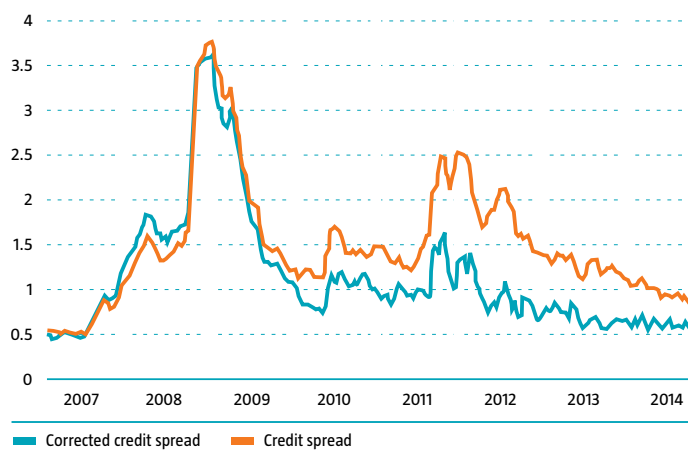
1.1.2 Cash

Cash is the odd one out when it comes to valuation, as by definition it is a component that is not left to its own devices. Central banks tend to use cash rates as a tool to reach their policy goals. You could therefore argue that cash is always neutrally valued, at least from a policy perspective. There is one exception, when interest rates have reached the zero bound, in which case the central banks will need to turn to other tools (e.g., quantitative easing) to try to reach their goals. Another way to come to the ‘cash-is-always-neutral’ statement is by observing that cash is the starting point of the investment process, the benchmark to beat. We prefer to take a different approach, however. Looking at cash in the longer run, it can be claimed that policy rates will roughly track nominal GDP, rather like bonds. However, given the liquidity premium and the fact that –unlike bonds– there is no negative pricing element, the discount versus nominal GDP should be lower. Looking at Europe, based on the current nominal growth rate of 2% and taking the 3.75% expected growth rate into account, it is clear that the current zero-percent interest rates are too low from a valuation perspective. In the section on macro tilts, we present arguments explaining why rates are not likely to rise substantially in the short term.

1.1.3 Investment grade credits and high-yield bonds

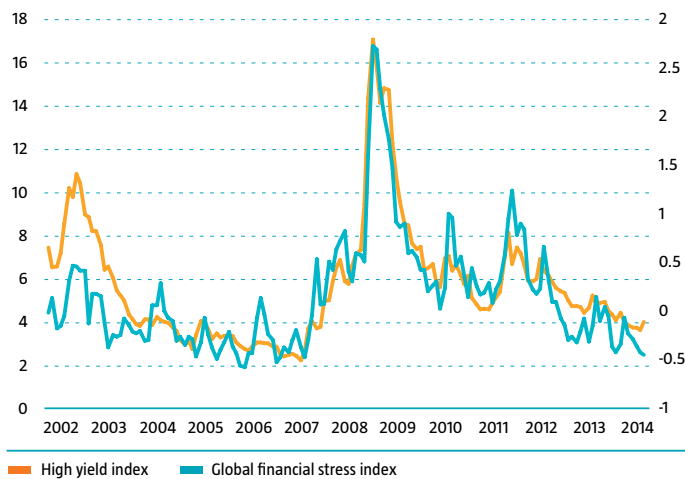
For investment grade credits and high-yield bonds we use US credit-spread data to determine the valuation of these asset classes. The US data has the longest history and represents the largest market by far. Currently, spreads are out of line with the median spread of the past. Therefore, in contrast

Figure 2: Adjusting for country risk, spreads are at 2007 lows



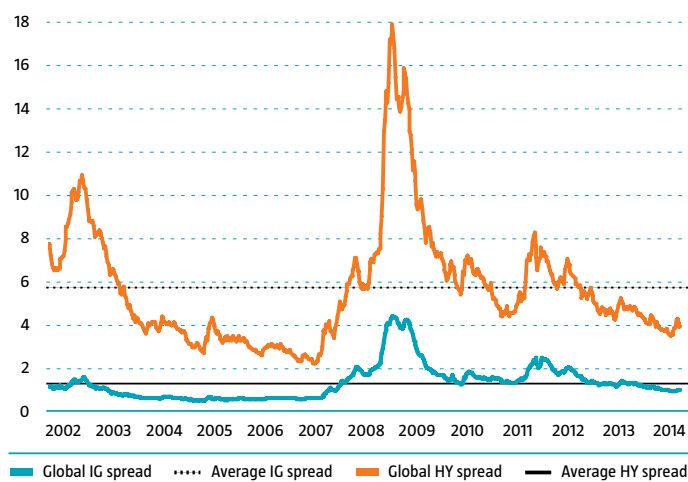
Source: Bloomberg, Robeco

Figure 3: High yield spreads vs global financial stress



Source: Bloomberg, Robeco

Figure 4: Global spreads compared to their historical averages HY and IG January 2002- July 2014.



Source: Bloomberg, Robeco

with our analysis last year, we now find absolute valuations stretched and we think this will limit the ability for investment-grade credits and high-yield bonds to outperform government bonds in the next five years.

European investment-grade credit spreads have compressed significantly relative to German government bonds, partly as a result of Draghi's pronouncement 'to do whatever it takes' to save the Eurozone. This has lowered systemic risk for the Eurozone and triggered credit-spread convergence across Eurozone countries. European credit spreads versus the German benchmark are still positive, but if we adjust for the sovereign risk (ie, comparing Spanish companies with Spanish government bonds) spreads are trading at 2007 lows (see figure 2). Accordingly, credit-default-swap spreads for Eurozone banks have declined considerably over the past years.

Also, improved corporate fundamentals (i.e., stronger balance sheets) have been heavily discounted by the market. As yields in the euro investment-grade market are now even below those of a global government-bond index, neither the yields nor the spreads are looking attractive to us. The spread component of IG is priced for perfection, and offers little protection when rates start to rise. All in all, we think that the valuation of investment-grade credits is even less attractive than government bonds, which is why the valuation factor in Table 1 carries a minus sign.

As for High Yield (HY), current spreads are now around 350 bps. Credit spreads for the global HY market have historically been closely correlated with financial stress metrics, which still have some room to fall further after the spike in 2007 to pre-crisis levels (see Chart 3). The remaining spread compression based on this variable is limited at best, not to mention that we expect volatility to pick up from these low levels in all of our scenarios.

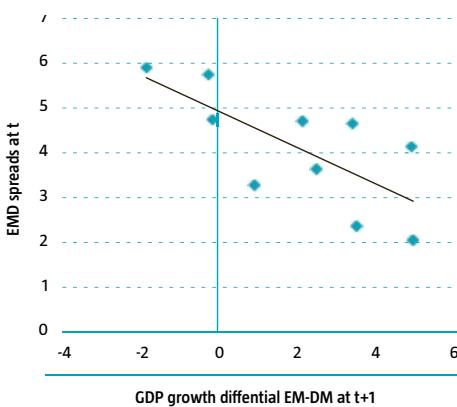
From an asset-class-only point of view, we find HY expensive. Global HY, for which we only have data from early 2000 available, shows that spreads are 36% below their average from 2000. However, this average includes some very strong stress.

For HY we are neutral on valuations compared to government bonds.

1.1.4 Emerging market debt

Emerging-market debt is a relatively young asset class. In this section we concentrate on unhedged emerging-market debt in local currency. Compared to high yield, this asset class offers higher spreads in combination with a higher credit rating. But, as different to high yield and developed government bonds, it is exposed to considerable volatility in terms of emerging-market currency. A basket of emerging currencies (the JP Morgan EM currency index) provides a 60-month rolling correlation of 0.84 with monthly EMD unhedged in local currency returns. So, valuation of this asset class implicitly requires a valuation of the spread component and an emerging-market currency valuation versus the dollar.

Figure 5: EMD spreads vs GDP-growth



Source: IMF, Bloomberg, Robeco

First, we look at the spread component. The difficulty here is the lack of data: the data we have since 2003 suggests current spread levels are 20% above average spread. Although this might be seen as a sign that EMD is cheap, it could simply reflect deteriorating fundamentals. So, the question is whether spreads have widened more than fundamentals warrant. To answer this question, we performed a regression on spreads of the JP Morgan EM debt index at time t versus realized GDP differences at time $t+1$ for the major emerging-market debt issuers versus the US (R -square = 0.51). We find that current spread movements anticipate the degree of catch-up in the following year quite nicely. Based on this relationship, and given our view of a reacceleration of growth in emerging-market debt countries versus developed-market growth in 2015, we judge current spreads to point to a more modest undervaluation.

Second, we investigate the movement in currencies in purchasing-power-parity terms against the US dollar. This widely used valuation metric for long-term currency valuations shows us that the 10 major emerging-market debt-issuing countries are currently 4.1% above their long-term average since 1995, which makes emerging currencies slightly overvalued.

All in all, although emerging-market debt has become less cheap from an asset-only perspective in recent years, we conclude that the valuation of emerging-market debt is more or less neutral. However, relative to (high quality) government bonds, we think the asset category still offers some value.

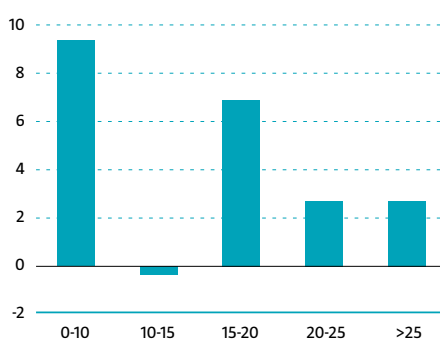
1.1.5 Global stocks

As an opening remark, we do not make a valuation distinction between the various factor-investment strategies referred to in Table 1. We assume a set mark-up for these strategies. For global stocks we take three approaches to estimate whether markets are currently over or undervalued.

Our preferred approach to determine the valuation of stocks is by looking at the well-known Shiller PE measure, also known as the Shiller CAPE. This measure can be considered a relatively conservative way of looking at stocks, as it takes the ten-year average of earnings as the basis to look at

current pricing levels. The underlying idea of this method is to filter out the business cycle, resulting in a much more stable earnings measure. The main drawback is that it is backward looking. In a scenario of rapid earnings growth, this valuation measure will lag considerably. Despite this drawback, the track record of the Shiller PE as a predictive tool has not been bad, as can be seen from the chart 6. This chart shows the level of the Shiller CAPE (grouped into five buckets for the US market) and the subsequent five year stock returns from 1881 to 2013. This analysis shows that as multiples expand and stocks get more expensive, the historical average future return on a five-year horizon declines.

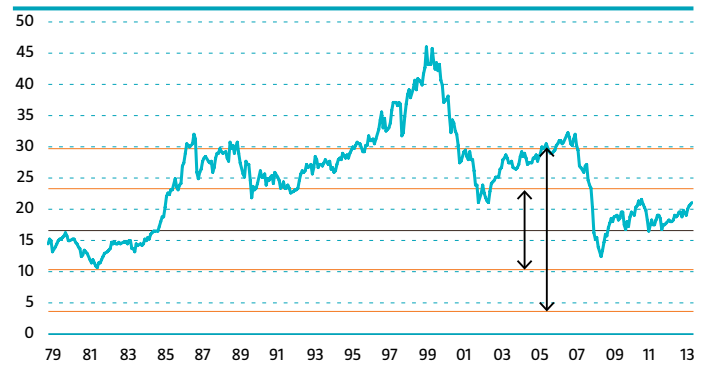
Figure 6: Shiller PE buckets vs subsequent returns (1881-2013)



Source: Shiller database, Robeco

Additionally, the volatility of the five-year future returns of the > 25 bucket is also notably higher compared to other multiple buckets. Rather than looking at the original Shiller PE (which is currently above 26), which is only for the US markets, we have constructed a worldwide measure. Looking at this measure, we find that there is currently an overvaluation of around 25%.

Figure 7: Shiller P/E for global equities (normative P/E and standard deviations based on US history, 1881-2013).



Source: MSCI, Shiller database, Robeco

1.1.6 Real estate

We primarily compare real estate to equities as they tend to show a significant correlation. Preferably we would have liked to look at a Shiller PE kind of measure for real estate, but since we do not have sufficient data, we have to resort to current PE levels versus stocks instead. Valuation ratios compared to equities have deteriorated since the start of this year, as the low capital market-rates environment has been especially beneficial for real estate. Forward price/earnings-ratios (P/Es) are now around 30% above the historical average relative PEs since 2005 (the earliest data we have available). Another measure to look at would be the dividend yield which is now roughly 1.6 x above the level of stocks, which is above the level seen ten years ago. This seems to suggest that the overvaluation might be a little less than the simple PE measure seems to suggest. The same conclusion applies if we look at cashflow data. On balance though, we believe global real estate to be overvalued compared to stocks. We expect the current valuation to generate a headwind in the next couple of years, as real estate tends to be more interest rate-sensitive than equities.

1.2 Macro tilts financial markets for 2015-2019

Following the valuation discussion, we will now focus on the macro tilts, i.e. the way we expect the world economy to develop in the next five years. As a general remark, it should be clear that it is impossible to pinpoint the exact developments and dynamics of the world economy on a one-year horizon, let alone a five-year timeframe. Economies are volatile by their nature, so even within any of the scenarios presented, temporary setbacks and periods of higher growth are to be expected. In other words, we present averages, the general direction, not the full dynamics.

Partly to reflect the volatile nature of these predictions, we present three economic scenarios: a baseline, one that is bullish with respect to growth and one that is bearish. Our baseline scenario (to which we attach a 60% likelihood) is relatively optimistic. Gradual normalization is expected to take place, which means that economies are moving back to their longer term average growth rates, with limited inflation risk. However, by attaching a higher likelihood to the adverse scenario (30%) than to the positive one (10%), we indicate that risks are skewed to the downside. We will discuss all three scenarios in turn, looking at the possible implications for asset returns, starting with our baseline scenario.

1.3 Gradual normalization (baseline, 60%)

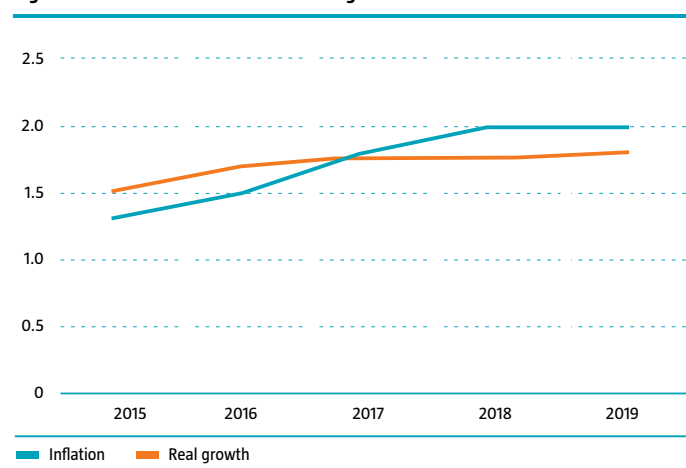
No matter how big the party, hangovers eventually lift. For the US, we are now more than five years further since the subprime-related recession officially ended. In line with Reinhart and Rogoff's findings that financial crises lead to weak recoveries, growth was lackluster during that period. However, the sources that dragged down growth seem to have dispersed one by one. Banking is no longer in recovery mode and looks healthy again; the housing sector has recovered; deleveraging by consumers appears to be over: even the long awaited capex boom (growth in real private non-residential investment) is beginning to take shape. Compared

to the US, Europe is lagging by about two years in this recovery process, which means that so far surprises have mostly been on the downside. Even here, the hangover will lift, although demographics, the incomplete and unfinished nature of the European currency union and indebtedness remain strong headwinds for years to come. On the other hand, the underlying trend toward technological innovation is a positive factor. Our baseline scenario will disprove the techno-pessimism of Robert Gordon with its resulting tepid growth in total factor productivity. Technological progress is here to stay. This could lead to a revolution in robotics and human-genome manipulation. Fears of an ongoing savings glut are probably exaggerated, as pent-up consumer demand is rife in emerging markets. Over the coming years, China will rebalance its economy and increase the quality of its social safety net. This will gradually result in a lower savings rate. On a global level, the savings rate will probably also come down over the years to come.

In this scenario, the US growth rate is expected to strengthen to 3%, the Eurozone will cruise at around 2%. Investments will rebound. The Chinese economy will gradually slow towards 6% in the medium term. 'Abenomics' will end the embedded deflation in the Japanese economy, mostly thanks to the additional weakening of the yen. Central banks will be able to gradually hike the short-term interest rates, first in the UK and the US, followed by the Eurozone and, eventually, Japan. High indebtedness and modest inflation limit the room for such hikes. This will be a process of small steps over relatively long periods announced in a timely fashion.

All in all, a moderately optimistic baseline scenario, considered from a growth perspective. The implications for the various asset classes will be looked at on a case-by-case basis, also taking the valuation into account.

Figure 8: Growth and inflation under gradual normalisation



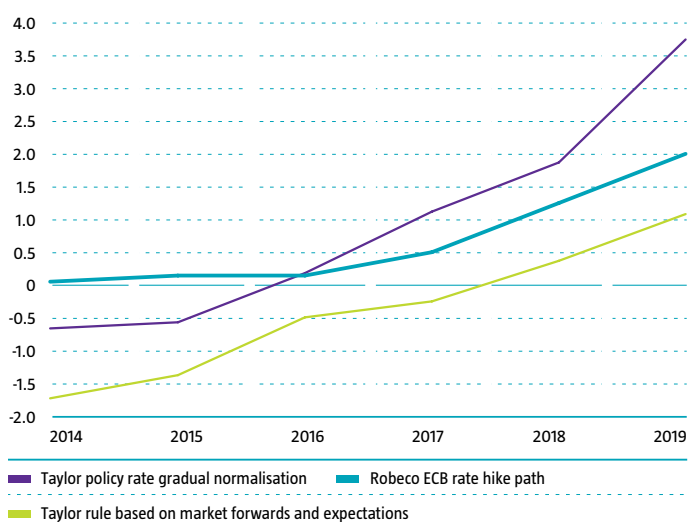
Source: Robeco

1.3.1 Cash (overvalued)

Given the focus of our client base, the cash return we present in this outlook is that relating to the Eurozone. We expect both the Fed and the Bank of England to hike rates in 2015 at the latest, which will be the first step in a long process of gradual normalization of monetary policy. Cash returns for an internationally oriented investor will therefore be higher than the 0.75% we present in our overview table.

To get a fair idea of what to expect from the ECB's monetary policy moving forward, we start out by taking a look at a Taylor rule based on Robeco estimates for inflation and unemployment. The Taylor rule is a simple, but relatively robust rule that quantifies how much central banks are inclined to adjust interest rates as a result of changes in inflation and output. Various measures of output have been used in the past, but for our analyses we look at the difference between the 'equilibrium' unemployment rate (from the OECD) and our own estimates of the Eurozone unemployment rates. For comparison, we have also looked at the outcome of a Taylor rule, using consensus and market-implied expectations with respect to inflation and unemployment. The outcome is as given below.

Figure 9: Taylor rule Eurozone



Source: Bloomberg, Robeco

As can be seen, if we would simply rely on the Taylor rule, rates would rise much more aggressively than what consensus expects. The first rate hike would take place somewhere in 2016 (with a modest 10 basis points), with policy rates moving to around 3.25% in 2019. This is a full year earlier than the policy rule tells us based on consensus views, while also suggesting much higher rates. According to the consensus- and market implied Taylor rule, ECB rates would only increase to a level of 1.0% in 2019.

Rather than sticking to this traditional Taylor rule outcome (blue line), there are good reasons to suggest central banks give credit to the 'lower rates for longer view', thereby deviating from the standard policy response (black line). As the chart also clearly shows, central banks would

currently be inclined to have substantial (-0.75%) negative rates in order to revive the economy. To circumvent this, central banks have opted for quantitative easing (QE) measures, which is still an option open to the ECB. Even though we do not expect the Fed to like unconditional QE for the Eurozone, given our core view that disinflation will end, the ECB's 'QE put' will hover over the market for a considerable time, as the reflation path will not be smooth. Given their recent experience, central banks are also more inclined to err on the side of caution, not least because the European banking sector is still in full deleveraging/restructuring mode. In a world of excess liquidity and market speculation on the need for its continuance, cash returns will remain low in the next five years, even as central banks start tightening. We expect the ECB to remain on hold until at least late 2016, and to hike from there on in small steps, with relatively long intervals, to 2% in 2019. All in all, we expect cash to have an average return of 0.75% over the next five years.

1.3.2 High quality government bonds (overvalued)

As in the case of cash, we look at the European bond market, given our client base. European bonds are of course not floating in a vacuum, but are influenced by the developments elsewhere in the world, most notably the US. That said, history has also taught us that differences in the level of bond yields can be significant and long-lasting, especially if monetary policy deviates. We therefore expect European bond yields to be more influenced by the economic developments in the Eurozone than the development of the US Treasury market. Our analyses of the three macro-economic scenarios therefore focus on the development of the nominal economy.

Nominal growth in the Eurozone is expected to show a gradual rise in the years to come. The current starting point is around 2% (1% growth and 1% inflation), which we expect to rise to a cruising altitude of 3.75% (2% growth, 1.75% inflation) for the 2018-2019 period. In equilibrium, this would bring bond yields to 3.5%, but –as with cash– we see a number of reasons why this level will not be reached.

First, one reason often given for rates to remain low for longer, is that advanced economies' debt to GDP continues to mount, leaving the case for financial repression by suppressing nominal rates to keep our leverage-based economy functioning. Deleveraging in private and government sectors is still incomplete and has further to go.

Second, we expect a lingering deflation scare in the European interest-rate market in the next five years, even as real activity recovers further. Investors have been anticipating deflation in the Eurozone and therefore are discounting QE in bond prices. Although inflation will return to levels more consistent with the ECB mandate of 'below, but close to 2%', the path will be rough. As we think the deflation scare will ebb, but not vanish altogether, we hold the view that this discount will not disappear entirely in our base case over the next five years. Structural reforms, commodity prices and the euro exchange rate, to name a few, will trigger volatility around our upward-sloping inflation path and will provide the occasional ammunition for deflation bears.

Third, technical factors also play a role in the downward shift in government

yields. The demand for safe assets has increased. According to the IMF, this largely reflects the rapid reserve accumulation in some emerging-market economies. From the supply side, BIS data show net negative issuance of government bonds over the last years. As austerity policies in the Eurozone have led to fiscal tightening, fiscal deficits have declined, lowering net issuance. Higher real economic growth could improve fiscal deficits further through higher tax receipts, enabling a somewhat less steep issuance profile to finance government debts. This will result in less upward pressure on rates for a given sovereign-bond demand.

For the above reasons we expect yields to remain subdued for the next five years, and in fact below the 'fair value' of 3.5%. We expect bond yields to rise to a level of around 3%. Although this may sound like a limited increase, given the scenario of gradual normalization in the world economy, it is still clearly above the levels that are currently priced into the forward curves. With this rise in bond yields we end up with an annualized return of 0.25% for the next five years.

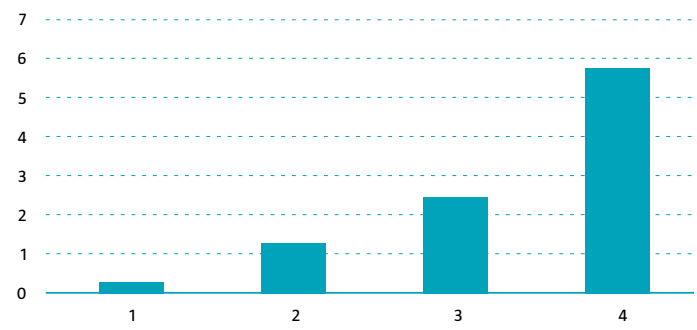
1.3.3 Investment grade (overvalued) and high yield (neutral)

Both investment grade and high yield credits are hybrid asset classes with both a risky asset (equity-like) component and a riskless (sovereign-bond-like) component. But the risk-factor implications for both asset classes are different. Investment grade is more sovereign bond-like and high yield is more equity-like. The sluggish recovery and benign inflation environment over the past years has been beneficial for performance of risky fixed-income asset classes such as high yield and investment grade. With default rates declining and in light of the continuing search for yield and credit spreads, the compensation for credit risk in the market has compressed significantly below long-term averages for both fixed-income classes.

In the context of gradual normalization, there is reason to remain cautious about the high-yield market. Leverage on high-yield balance sheets is increasing and likely to deteriorate. This does not pose an immediate threat, as long as cashflows remain healthy and capital-market rates are subdued. Also, refinancing risk is moderate in the near term, because many firms have managed to secure cheap funding for longer in the current interest-rate environment. However, liquidity risk could become more pronounced in the medium term. Several market supervisors have fired warning shots by pointing out that investors are currently not fully compensated for liquidity risk in the high-yield market. Another point of concern remains the level of covenant-lite high-yield issuance and the increasing leverage of issuing firms which makes the market less attractive compared to our last five-year outlook. Additionally, we find that default rates for speculative grade bonds are historically low, even when corrected for the phase of the cycle we expect (i.e. further recovery / gradual normalization). We made quartiles from US defaults rates during NBER expansion periods (most representative phase of the economic cycle to the base scenario we are expecting in the next five years) to the period we are expecting. We find that HY defaults rates are now in the lowest quartile of a historical default distribution of economic expansion periods.

Also, when we relate default rates to the inflation cycle, we historically observe the lowest default rates within the current Eurozone inflation regime. Since 1921, the median default rate has been only 0.9% for periods where inflation moved in a range between 0 and 1% (as currently is the case in the Eurozone). Within gradual normalization we expect inflation to increase gradually to 2% at the end of the five-year horizon with an average inflation over the period of 1.75%. It is therefore likely that we will move to higher default rates that correspond more with the median default rate of 1.75% seen in the 1% - 2% inflation bucket. Overall, although future default rates could still fall further, the remaining upside for spread compression is quite limited, even within the relatively benign climate of gradual normalization.

Figure 10: Speculative grade median default rates quartiles 1921–2014 during expansion cycles

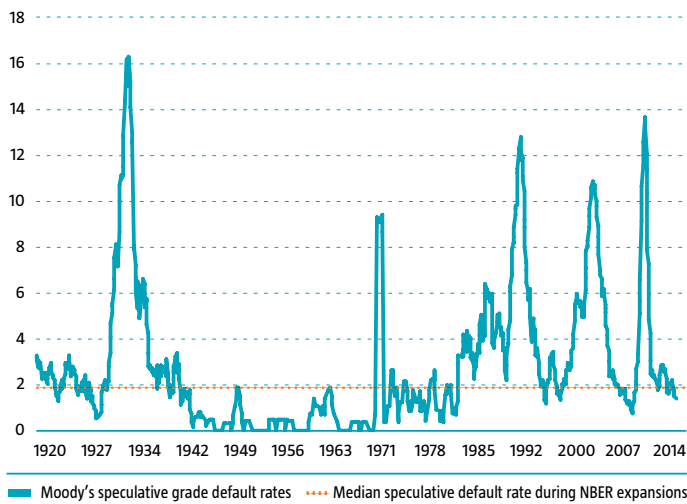


Source: Moody's, NBER

Although these remarks apply less to investment-grade credits, we still think that the outlook for credits is weaker than that of high yield. As stated, credits offer more of a bond like return profile than high yield, which means that they will be more impacted by the weak performance outlook we expect from government bonds. Given the current very low yields, as well as the low spreads, there is only a very limited buffer to deal with the general rise we expect to see in bond yields. Added to this is the valuation element which we discussed: the spread component of IG is priced for perfection.

All and all, although spreads for HY tend to widen more progressively compared to investment grade within an expanding economy, we think high yield will be able to outperform investment grade as the spread buffer for high yield is significant larger. This will make high yield more resilient to the rise in capital market rates we expect compared to investment grade credits. On balance, in our gradual normalization scenario, we expect an annualized return of 2% for high yield and ¾% for credits.

Figure 11: Speculative default rates, 1920-2014



Source: Moody's, NBER, Robeco

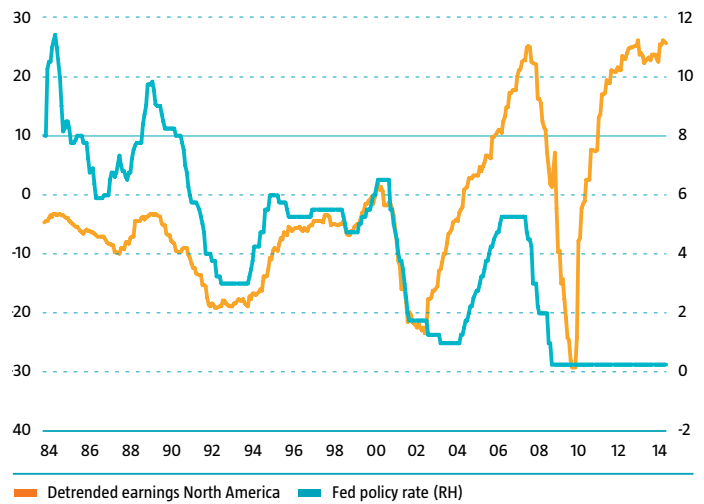
1.3.4 Equities in developed (overvalued) and emerging (undervalued) markets

From a global earnings perspective, the scenario of gradual normalization is not a negative one. Real growth of the world economy is projected to average 3%, boosting nominal GDP growth to 5%. Revenues will pick up, which should boost underlying earnings growth overall. Consumers are expected to boost demand, with a new leverage phase (at least in the US) taking shape. Household leverage is very significant in explaining earnings variation in the US since the 1950's.

There are some potential headwinds though. Since we expect central banks to raise the interest rates, while bond yields are forecast to rise, some downward pressure on margins can be expected. Over the past decades, interest rates and bond yields have generally been downward trending, helping to bring finance costs down and pushing margins higher in the process. In our gradual normalization scenario, we expect this process to be reversed. This effect should not be overestimated though: the impact from interest rates will be muted (especially in Europe), while corporates have taken advantage of this to lock in low interest rates, thus reducing the refinancing risk in the medium term. More generally, rising interest rates do not appear to be much of a problem until we reach the end of a tightening cycle, as can be seen in Chart 12. The growth argument clearly outweighs the cost impact in the early part of a tightening cycle. This earnings cycle may be atypical in the sense that current de-trended earnings show that the Fed should already have started the hiking cycle. This accommodative stance of the Fed has strengthened corporate balance sheets ahead of the next hiking cycle (i.e. boosted profit margins). Firms should therefore be well positioned.

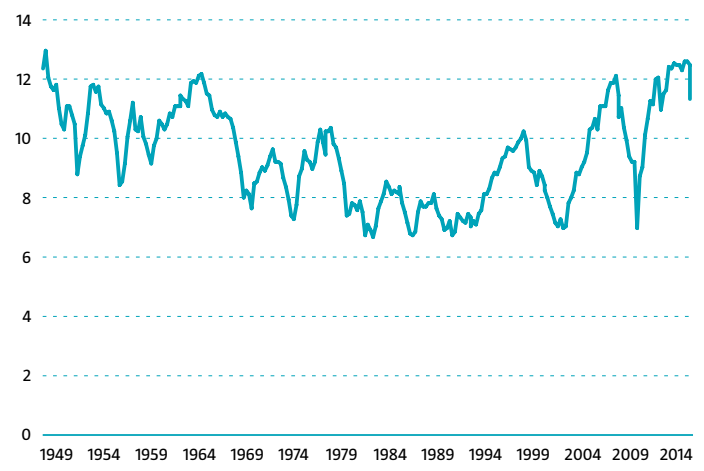
Second, current corporate profit margins could erode due to the increased bargaining power of the workforce. Again, this is not something we expect to have an immediate impact: in the US, profit margins generally tend

Figure 12: Fed policy rate and detrended earnings



Source: Datastream, Robeco

Figure 13: US profit margins

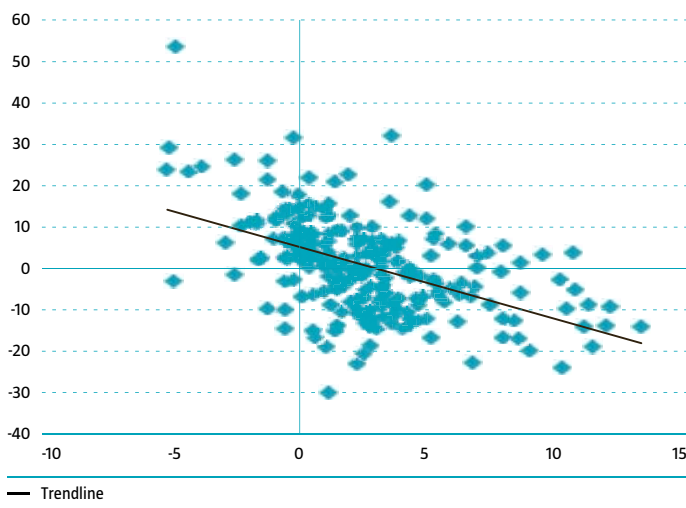


Source: Datastream, Robeco, BEA

to peak with cyclical lows in unemployment. In the context of gradual normalization, this may perhaps happen for the US at the end of the five-year period, but is unlikely to happen in Europe at all.

This does not mean that rising wage costs will not affect margins at all. Despite ongoing labor productivity, we expect unit labor costs to start to rise, at least in the US. Even though the general unemployment rate is not close to its former low, the signs picked up indicate a scarcity of trained and experienced personnel. Based on the sound empirical causal relationship between the change in unit labor costs and the change in profit margins (see Chart 14), wage growth above productivity growth means lower pricing power for firms and lower profit margins. In Europe, on the other hand, we do not expect labor cost to play a major role, as there is still plenty of slack available.

Figure 14: Change in unit labor costs versus change in profit margins 1971-2014



Source: Datastream, Robeco

In this scenario, we would expect corporate leverage to play an offsetting role to some extent. Incentives to re-lever are favorable: growth is picking up, inflation is still subdued, while liquidity is still amply available. Although this will steadily erode the underlying credit outlook, it also helps as a mechanism to boost earnings growth. On balance, we expect earnings growth to more or less track the growth rate of the general economy, which is why we end up with a neutral sign based on the macro-environment for equities.

Adding the neutral macro tilt together with the general overvaluation of stocks, we expect to see an average annualized return of 5.5%. Compared to our previous outlook, this has been lowered from 7%, with valuation being the main argument. Although 5.5% may be considered a bleak return if we compare it to the 8% return we would expect in a steady state, it should be reminded that this follows a five-year period with an average annualized return of 13%. Additionally, if we look at the relative performance of stocks versus bonds, stocks are still expected to yield a higher excess return compared to the equilibrium level. Not because of the strong performance of stocks, but rather because of the weak performance of bonds.

We also expect the macro scenario for emerging markets to be generally neutral. We see the growth story for emerging markets as still intact, but expect Chinese growth to gradually move to a lower, more sustainable level. Gradual normalization in the West also means that much of the end demand for goods will also recover gradually. However, strong economic growth does not always translate into earnings growth for shareholders. State-owned companies and new startups are responsible for a good part of the underlying growth, which will not be captured by existing shareholders. Added to this is the fact that the emerging markets are far from a homogenous group, with some parts still showing signs of high leverage and unsustainable current-account deficits. In general, we expect currencies to exert downward pressure. In total, we end up with a neutral rating from the macro side.

With a neutral macro sign and a valuation that is cheap versus developed markets (but neutral on a stand-alone basis), we lower the outlook for the emerging-markets return by less than we did for developed markets. We forecast an annualized return of 6% down from 7% last year. On balance, we thereby raise the relative attractiveness of emerging markets equities compared to both global equities and the steady-state excess return on bonds. As stated earlier, the underlying volatility for emerging equities is higher than that for global stocks.

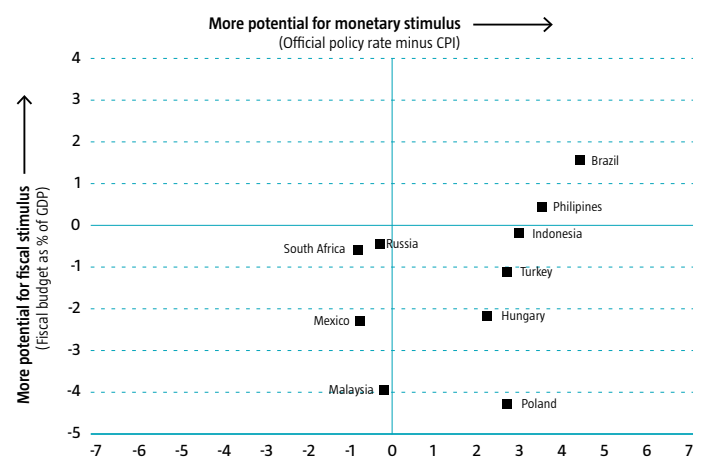
As for real estate, even though the gradual normalization scenario is not negative for underlying earnings growth, the sector is going to face headwinds from the rising bond yields. As such, the macro tilt will be negative for real estate

1.3.5 Emerging market debt (neutral versus bonds)

Within our base scenario of gradual normalization, we are not outright positive on emerging-market debt. Geopolitical tensions have made a frequent appearance and although spillover effects within the EMD universe from national political crises remain moderate, the risk has not disappeared. Baldacci, Gupta and Mati (2008) suggest that these political factors determine a significant part of the credit spread of emerging-market debt. Although we expect emerging market economies to continue their economic catching-up, which in itself will contribute to spread tightening, further convergence to developed market standards is not a given in the next five years in terms of governmental and democratic stability and socio-economic conditions.

One of the key challenges for emerging markets will be to maintain both internal and external stability. From an internal balance perspective, fiscal policy seems more restrained compared to a year ago. Ability for fiscal expansion to stimulate their economies could become more limited for the bulk of the emerging-market-debt issuers, as social-welfare systems are maturing. Fiscal deficits as a percentage of GDP have already increased. However, overall government-debt levels are still well

Figure 15: Monetary policy room versus Fiscal policy room

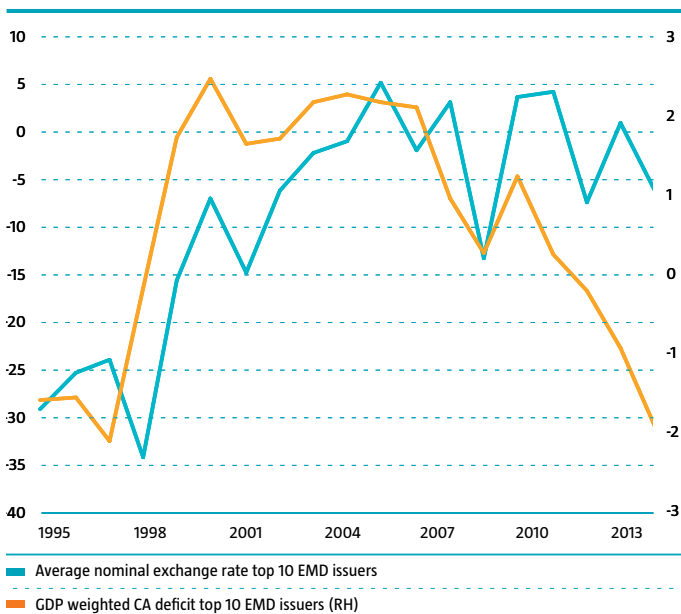


Source: Bloomberg, Robeco

below those seen in developed markets. From a monetary policy-room perspective, the real exchange-rate appreciation of emerging currencies we have seen suggests that relative inflation pressures are still present and policy makers have to address those pressure points with supply-side investments, easing cost push-price inflation and structural reforms in labor markets. Nevertheless, if structural reforms are successful, more room for monetary stimulus could open up.

From an external-balance perspective, we are more pessimistic. Current-account deficits in emerging markets are still significant from a historical perspective, and a further adjustment process could require further depreciation of currencies in the medium term. There are several reasons why this upward current-account adjustment process will be slow. First, the upcoming emerging-market consumer class will not only finance consumption by leveraging up further. Higher consumption will also be financed from the income stream, leaving us less convinced of an increasing savings quota from emerging-market economies. China is exemplary in this respect, as a result of the intended transformation from an export-led to a more domestic-oriented economy. A gradually slowing growth rate in China, which we expect in our base scenario for the next five years, would also result in lower import demand and thus lower export volumes from other emerging markets to China, preventing any significant rise in current accounts. From the investment side, we expect at least some countries to address the supply-side problems in their economies, making them more competitive in the global market and preventing cost-push inflation and social unrest. However, higher domestic investment will put a brake on improving the current account as well.

Figure 16: Current accounts versus EM currencies



Source: IMF, BIS, Robeco

Emerging-market policy makers thus have the complex task of managing a tricky balancing act between external and internal stability. We expect

continuing divergence within emerging markets according to differences in export orientation, current account balances, fiscal and monetary policies, and political stability.

On balance, taking the overall correction in world bond markets into account, we expect an annualized return of 2%. This translates into an excess return of 1¼% over government bonds. This is slightly higher than the result we would expect in the steady-state result, which is a reflection of a favorable valuation compared to government bonds.

1.3.6 Commodities

Commodity returns have three fundamental drivers: the risk-free rate, spot return and roll return. As the academic literature establishes, roll returns are very important for commodities, but it is nearly impossible to determine in advance what the prefixed sign for future roll returns will be. Last year was a clear example of how risks like potential civil wars, geopolitical tensions and extreme weather patterns can rotate commodity forward curves. We thus remain neutral on the future roll return. Concerning the spot return, the early phase of economic recovery has traditionally been shown to be positive, as recovery in the manufacturing sector in particular results in more demand for commodities. However, given the supply glut in global mining and the ongoing energy revolution in the US, there are still powerful countervailing forces at work. The existence of large commodity-risk premiums remains unproven, which is why we assume a steady-state return of 0.5% above cash. Given the fact that we lowered our risk-free rate considerably below our steady-state return, we expect a return of 1.5% for commodities in the next five years.

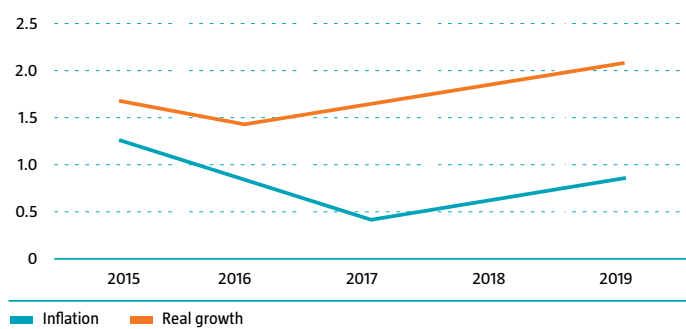
1.3.7 Hedge funds

Hedge-fund returns have two fundamental drivers: the risk-free rate and an excess-return premium above cash which is the result of possible manager skills and systemic exposure to risky asset markets. We proceed in our long term returns chapter with a risk premium of 1.75% above cash. As part of the systemic risk of a hedge fund is related to equity risk, we lower the risk premium, because we have lowered our equity risk premium over the next five years. Given the lower equity return of developed markets of 125 bps and a 60% correlation of the general hedge-funds sector with equities, we lower the risk premium for hedge funds by 75 bps, leaving 1% premium above cash. In conclusion, we now expect a return of 1.75% for hedge funds in the next five years.

1.4 Secular stagnation (30%)

For the scenario of low growth for years to come we reserve the label of 'secular stagnation', a term coined by 'the American Keynes', Alvin Hansen, at the end of the Great Depression in 1938 and reintroduced by Larry Summers, the former chief economist of the World Bank in late 2013. Hansen suggested that the American economy would never grow rapidly again, because all the growth ingredients had played out, including technological innovation and population growth. Of course, pessimism about the world economy is understandable to a certain extent. It has been argued that the period of large-scale innovations is behind us and that current technological progress does not amount to much

Figure 17: Growth and inflation under secular stagnation



Source: Robeco

(a proliferation of apps isn't exactly a revolution). Furthermore, demographic developments with stagnant population growth and increasing life expectancy are detrimental to the growth potential of the world economy. The low-hanging fruit in terms of progress on education has been more or less reached (rapidly diminishing returns). Contrary to expectations, globalization has led to an increase in inequality, undermining income growth for the middle class. This weakens the demand side of the economy. Finally, public debt has risen substantially; governments will be a drag on the economy for the foreseeable future. Hansen's only medicine, large-scale deficit spending by the government is unfeasible. What would the global economic environment be like in this bleak scenario?

The current strong growth of the US economy would appear to be unsustainable and would quickly be extinguished. Under these circumstances, the Fed would probably resume QE but would conclude in due course that this policy does not work. The US would be left with 0% short-term interest rates. The US economy would probably continue to grow slowly, but with a growth path of around 1 - 2%. An investment boom would be out of the question in such an environment. Elsewhere, Abenomics would also be dampened. Japan would fall back into deflation. The Chinese economy would eventually switch to a lower structural growth path, perhaps first experiencing the hard landing long expected in some quarters. The Eurozone could get stuck on a 0% - 1% growth path. Deflation could become a reality. The European Central Bank might unleash QE, pushing down the long-term interest rates, with little positive economic effect, but keeping the Eurozone intact for the time being. A growing sense of despair might raise political tensions. For selected countries, the Euro exit could come onto the agenda. Of course, a euro exit is no easy option and certainly not cost-free and would add additional deflationary pressures.

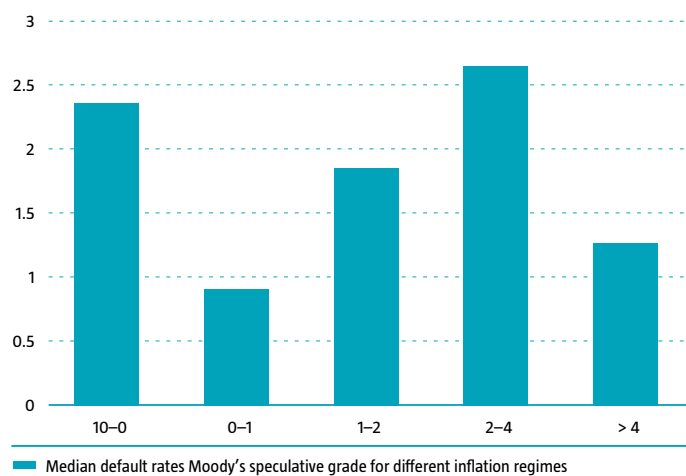
However, this is not a full-blown recession scenario, with large-scale depression defaults affecting unemployment rates. As in recent years, central banks would try to prop up the economy with unconventional measures, even though the impact of these policies would be likely to be less effective than they have been thus far. The fact that we attach a relatively high likelihood to this scenario (30%) indicates that this certainly is a potential result. Risks are on the downside.

1.4.1 Cash and bonds

As for cash, a workable definition of secular stagnation is that negative real interest rates are needed to equate savings and investments with full employment. We consider secular stagnation to be characterized by a continued zero-interest-rate policy (or ZIRP) adopted by central banks. In this state of the world, the ECB would not hike rates in the next five years, as even a zero-policy rate is still too high to create full employment. The central bank would be caught in a liquidity trap, a situation where the conventional open-market operations (purchases of short-term government debt by the central bank) lose traction, because the money-market rates are almost at zero. As the ECB will have hit the zero lower bound in its conventional rate policy, it will deploy unconventional measures to fight deflation (expectations).

For the Eurozone, we expect a real rate of growth of 1%, while deflation will on average be around 0.25%, which compares to the levels we have seen in Japan in the recent past. For government bonds this scenario means that nominal bond yields will remain depressed and at times may even decline further. Assuming an average bond yield of ¾%, this means that annualized returns will be positive (2%) and clearly higher than the returns in our baseline scenario. However, given that we are already at unprecedented low levels, the nominal return is still going to be way below the steady-state return of 4½%.

Figure 18: Median default rates for different inflation regimes



Source: Moody's, Robeco

In the context of secular stagnation, we expect very modest returns for risky fixed-income classes as aggregate demand falls and cashflows decline, harming interest-rate coverage ratios. As can be seen from the chart, in deflationary scenario's (utmost left bar), default rates tend to rise compared to the benign subdued inflation environment we are currently experiencing. This will lead to credit spread widening.

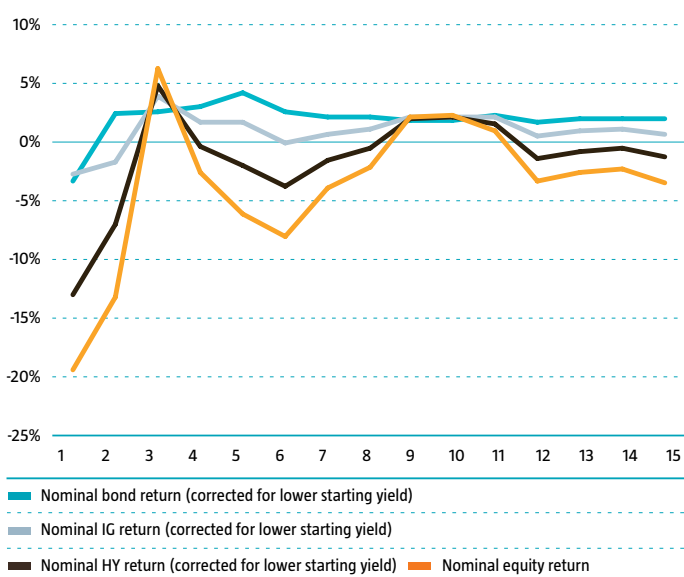
The lower risk-free interest rates we expect with Secular Stagnation, are barely able to compensate the negative-return impact from spread widening. Additionally, the risk of higher volatility is also present.

Continuing low rates will likely blow bubbles, as the earnings potential of high yield issuers deteriorates while investors have an incentive to demand for higher coupons. This will cause volatility in the asset class, which will be higher for high yield than for credits. The larger equity like component, which makes high yield more risky, will also bring relatively lower performance compared to investment grade.

In order to quantify the impact, we use the method presented by the 'Commission Parameters'. According to the Commission, high yield can be seen as a 60% equity risk and 40% sovereign bond risk, while investment grade can be simulated by using an average weight of 17.5% to equity risk and 82.5% to sovereign bond risk. Running simulations using these numbers, we get results that match those that are found by Hallerbach. He finds that both asset classes underperform sovereign bonds in a deflationary environment that causes stagnation. However, high yields underperforms investment grade as spreads widen more compared to investment grade credit spreads. The magnitude also seems quite consistent with the results during NBER recessions in the US, as negative excess returns on government bonds are in line for HY (-4,0% in Japan versus -4.5 % during NBER recessions in the US), albeit somewhat different for investment grade (-1,1% in Japan versus -3.0% during NBER recessions in the US).

Applying these rules and taking Japan's 1997-2011 period as a benchmark -a period which closely matches our Secular Stagnation outlook- while adjusting for the fact that bond yields are already a lot lower than those seen in Japan in 1997, we end up with these simulated returns for high yield and investment grade.

Figure 19: Simulated geometric returns DMS corrected for lower starting yield compared to Japan experience



Dimson, March, Staunton (2014), Robeco

Using this methodology, we are able to quantify the impact of the adverse scenario for our returns. For investment grade we assume that gains from declining capital market rates are sufficient to compensate for the spread widening within IG. This indicates that on balance, returns for IG would be comparable to those in our main scenario. As the equity component is much larger, high yield returns will end up below our base case scenario, although we still expect returns to be marginally positive. There are two remarks on this: First, these conclusions are sensitive to timing, especially so for high yield. If the adverse price shock takes place in the early part of the forecast period, it means that yields will be higher for the remaining period, compensating the loss as time goes by. If, on the other hand, the adjustment takes place during the end of the forecast period, there will be no compensation in the form of higher yields. In that scenario, returns may even end up negatively over the whole period. Second, these results of course depend on what to expect for equities, which we will now address.

1.4.2 Equities

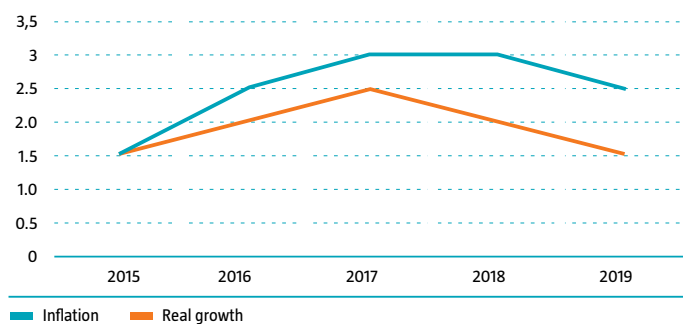
It is clear that this is a negative overall result for equities. In general, the equity outlook in this scenario becomes bleak as aggregate demand falls with consumers postponing purchases. Leveraged consumption falls as real debt burdens mount, spurring a further fall in consumption. Firms cut back on investment and production capacity, lowering real activity and future earnings capacity. As leading indicators begin to slide slowly but consistently downward, earnings revisions by stock analysts will follow, lowering future equity-return prospects. For Europe, which will be experiencing mild deflation during the forecast period, the outcome would probably resemble that of the Japanese deflation experience from 1997-2012. Annualized returns over that period reached -3.3%. We consider this the low end of the range, as we expect the ECB to be more proactive in fighting deflation than the Bank of Japan was during this timeframe. Although QE will not be effective enough to lift prices, it does supply the market with ample liquidity, which softens the negative impact in equities. As for the US and the emerging markets, we expect to see continued moderate growth, which means that equities will at least also be partly supported by earnings growth. Based on the current annual dividend yield of 2,5%, which we expect to be maintained in this scenario, we expect overall flat returns for equity markets. This may sound too 'bullish', but it should be kept in mind that this is not a recession-doom scenario, but rather a low-growth deflation scenario. In relative terms, in an excess-return-over-bonds comparison, it is clear that equities will yield a negative return.

As for real estate, this sector will also be hit by the weak growth, but stands to benefit from the low bond yields.

1.5 Strong recovery (10%)

Our third scenario foresees a strong recovery, assisted by a monetary policy which has been too loose for too long. Before long, the US and UK economies are firing on all cylinders. An investment boom unleashes a host of innovations, raising productivity strongly and entering the long-term structural growth path. The innovation wave is not limited to the US – Japan, for instance, will experience a revolution in robotics. China will succeed nicely in rebalancing its economy. The Eurozone growth rate will gradually strengthen to above 2%. As a consequence, inflation is on the rise as well as long-term interest rates. Central banks, keen to err on the side of caution, keep rates too low for too long. A first rate hike in 2015 in the Anglo-Saxon economies is inevitable, but the path thereafter will be very gradual. A repeat of the bond-market crash of 1994 will be avoided at all cost. As a consequence, the world economy will experience higher inflation at the end of the five-year period than the 2.0% currently seen as optimal. An inflation rate in the order of magnitude of 4.0% in the end is much more likely in the developed world, and in emerging markets, probably even higher. Europe will be on the lower end of the inflation spectrum, with inflation peaking at 3% before falling back. Of course, the seeds of a crash following the worldwide boom are being sown, but this will probably take place outside the five-year forecast horizon by a wide margin.

Figure 20: Growth and inflation under strong recovery



Source: Robeco

1.5.1 Cash and bonds

A strong recovery will lead to earlier and more aggressive policy hiking by central banks, compared to our gradual normalization scenario. The US and UK will lead, followed by the Eurozone. Inflationary risks will increase in this scenario, especially from 2016 onwards, when we expect strong Eurozone growth to have almost eliminated the slack in the labor market and increasing wage growth translates into inflationary pressures. Central banks at first may be reluctant to increase rates, but will eventually raise them to counter inflation. For cash this means that we will see an average return of 2%. This may sound low in the face of increased inflation, but it should be pointed out that this recovery scenario will not take place overnight, while the starting level of interest rates is of course close to zero.

As for bonds, higher short-term rates as well as higher inflation can only mean one thing: bonds will suffer. Starting from the current low point, we

expect nominal 10Y interest rates to rise to their longer term steady state level of 4.5%. This will push returns into negative territory over the five-year time horizon.

A strong recovery is not necessarily beneficial for risky fixed-income classes like investment grade and high yield. In general, both asset classes will suffer from the general correction taking place in the underlying government bond market. Also, spreads are likely to widen as firms are confronted with higher wages, while higher interest rate costs lead to deteriorating interest coverage ratios. This projected spread widening is also confirmed when comparing spread development of high yield and investment grade during historical NBER expansion periods in the US. The average change in the US HY credit spread on a monthly basis during an expansion phase was + 0.08% (+ 0.02% for IG). Additionally, we expect higher inflation in the strong recovery scenario as labor bargaining power improves and leads to price-wage inflation. With inflation in the 2%-4% bracket in this scenario, history shows that the corresponding median default rates are 2.6%, more than double the current 1.2%. This confirms the view that spreads tend to widen in period of strong real economic recovery with inflation overshooting central-bank policy rates, which we think will be the case in this scenario. On balance, we expect returns for credits to be close to zero on average, while we are somewhat more positive on high yield, despite the deteriorating credit environment. As we already pointed out in the secular-stagnation scenario, this conclusion depends a lot on the exact timing of the adjustments taking place.

1.5.2 Equities

Faster growth is not necessarily good for equity prices. On the earnings side, we expect the profit margins to decline more markedly compared to our base scenario, due to the combination of higher interest rates, higher capital-depreciation rates and higher wage growth. Unemployment would quickly pass the non-accelerating inflation rate of unemployment (especially as the NAIRU shifts structurally higher in this scenario, owing to the wave of technological innovation making some members of the workforce obsolete), rising wage demands by the workforce that remains in demand as the labor market becomes tight. However, the impact of the higher bargaining power of the workforce will be mitigated by productivity growth outpacing wage growth, lowering real wages for firms. The more pronounced drop in profit margins will outpace volume growth, lowering the earnings profile versus the earnings profile into gradual normalization. At the same time, the increase in interest rates and bond yields means that the strong search-for-yield-force that has supported stock markets in recent years is set to decline. Simply put, from an investor's perspective, there will be more return alternatives to pick from, especially at the end of the forecasting period.

On balance, we expect a more volatile outcome for stocks compared to our base case, with on average somewhat lower returns. Relative to bonds however, the excess return for equities over bonds will be a lot higher compared to our base case, and also clearly in excess relative to the longer term steady state. This is of course related to the negative return we forecast for bonds.

As for real estate, the strong rise in bond yields will hamper performance relative to stock.

In Focus: Is the euro crisis over?

In July 2012, the president of the European Central Bank (ECB), Mario Draghi, vowed to do “whatever it takes to preserve the euro, and, believe me, it will be enough.” Apparently, the ECB finally has transformed itself into a true ‘lender of last resort’ for the euro area. The risk premiums on peripheral bonds for Germany have collapsed, the peripheral equity markets have outperformed. Is this the time to declare victory? Not so fast.

ECB still not a true ‘lender of last resort’

The ECB is still not a true lender of last resort, as its support is conditional and the legality thereof has been thrown into doubt by the German Constitutional Court in Karlsruhe. It can in principle buy an unlimited amount of government bonds that mature in 1 to 3 years, provided the bond-issuing countries agree to certain domestic economic measures in the form of a full macroeconomic adjustment program involving EFSF/ESM (European Financial Stability Facility/European Stability Mechanism) or a precautionary program (Enhanced Conditions Credit Line). In case of noncompliance, the ECB will theoretically terminate the OMT (Outright Monetary Transactions) buying program that has so far not been activated. The legality of OMT has been questioned by the German Constitutional Court, partly due to the open-ended character of the program, but the Court has not reached a final verdict. Its preliminary conclusion was that OMT is illegal according to EU law. However, the Court has referred the case to the European Court of Justice (apparently treating it as a lower Court), asking the Luxembourg judges to add conditions to the OMT program to make it possible for them to reconsider their verdict. These conditions could easily rob the OMT of its practical effectiveness. Legal uncertainties make activating the OMT questionable at this stage. Fortunately, the broad recovery in the Eurozone makes it highly

unlikely that the OMT will be activated in the foreseeable future. However, this instrument remains a doubtful measure and with it the possibility of the ECB to act as lender-of-last-resort.

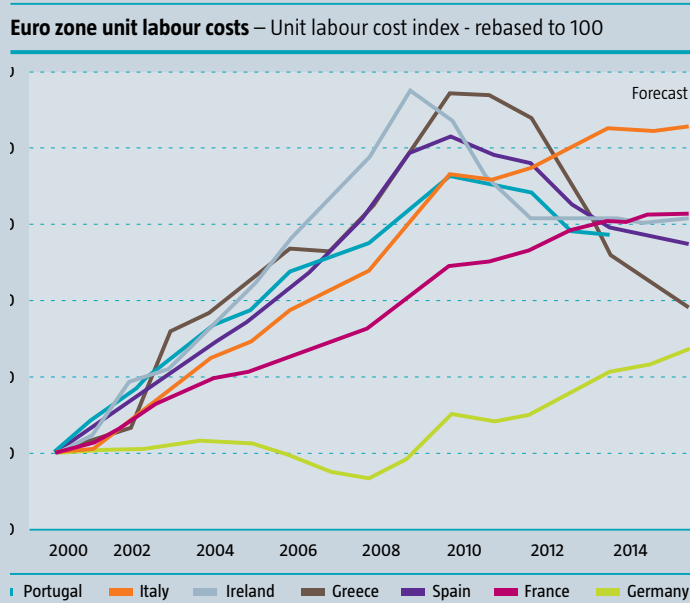
Problems of competitiveness remain.

Germany adopted the euro when the Deutschmark was overvalued. For years, the German economy struggled, creating a climate in which wage growth and structural reform were limited. Vis-à-vis its European partners, unit labor costs rose only modestly. The post-Lehman crisis led to a lowering of the

differential vis-à-vis Germany for a number of countries, most markedly in Greece, but also significantly in Spain, for instance. However, there are two important exceptions, France and Italy, which are the second and third largest economies in the Eurozone. It is no wonder that both economies are struggling at the moment. This impedes an improvement in employment and threatens domestic consensus on the need for euro-appropriate policies. A question that remains open is whether unemployment can be brought down fast enough and to a sufficient extent to prevent a political backlash.

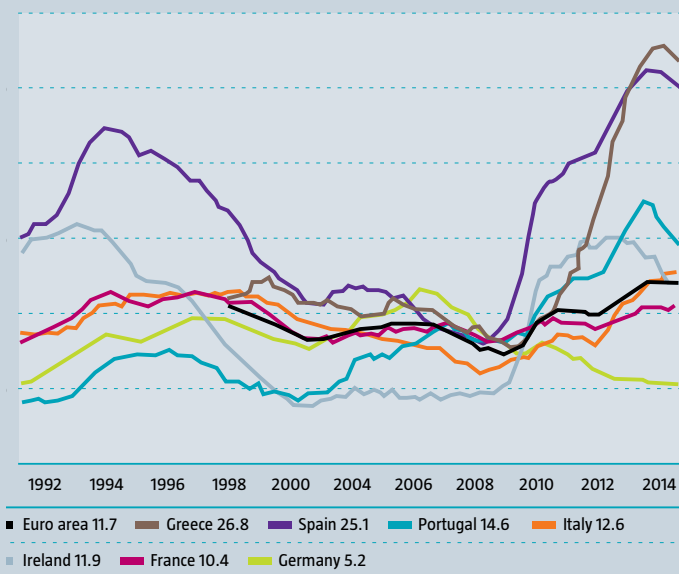
Banking union underfunded and incomplete

Supervision of Eurozone banks will be centralized. Also, European leaders have agreed on the creation of a single resolution mechanism, that will be responsible for shuttering or restructuring the 130 biggest euro-zone banks if they should run into trouble, as well as 200 or so cross-border banks. It will also have the right to intervene in any of the approx. 6,000 euro-zone lenders if it sees the need. Decisions on whether to wind up a



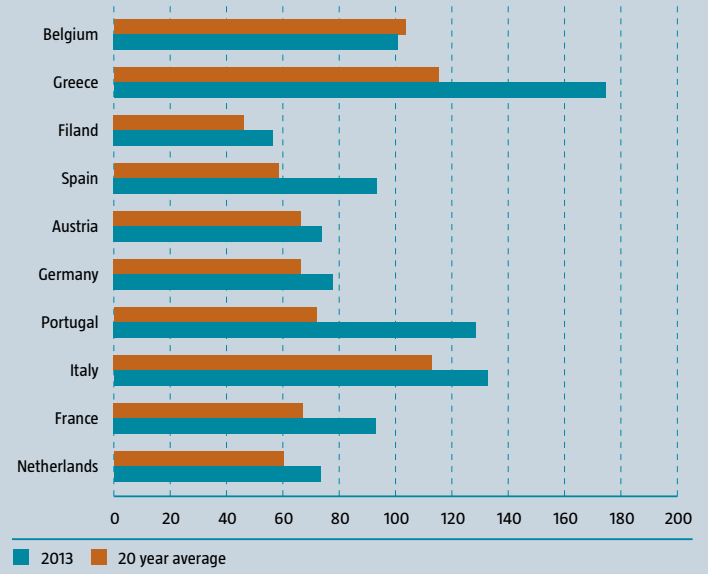
Source: Thomson Reuters Datastream, OECD

Euro zone unemployment – Unemployment rate in %



Source: Thomson Reuters Datastream, data to Apr 14

European debt to GDP ratios – Government gross debt as percentage of GDP



Source: Thomson Reuters Datastream, European Commission

struggling bank and how to share costs among creditors will be prepared by a single resolution board, made up of representatives from euro-zone governments plus five permanent officials. But any board recommendation will have to be approved by the EU finance ministers. Ministers want a bank's shareholders and creditors to pick up the bill for its failure, and new EU rules can force investors to forego their claims or see them converted into equity. However, in some cases, a lender's resolution may still require outside money, for instance to recapitalize essential parts of a bank to be sold, or to provide liquidity for the resolution. As a safety net, governments will build up national resolution funds by imposing levies on banks. These funds will be gradually merged over 10 years into one European fund containing around EUR 55 billion. All in all, the slow building of a rather limited fund means that the resolution mechanism lacks a convincing ex ante fiscal backstop, which could foster a passive attitude.

The logical completion of a full banking union would be a Europe-wide deposit guarantee. But this ambition seems to have slipped off the political agenda. Currently, the guaranteed amount has been harmonized to prevent regime shopping by European depositors. But the local sovereign is the ultimate guarantor, not the Union. As many sovereigns have hardly earmarked reserves to make good on the

guarantee, depositors could in a crisis situation conclude that their local sovereign could very well be unwilling or unable to validate the guarantee, provoking massive capital flight from the country, exacerbating the crisis. The unfinished, incomplete and underfunded banking union remains a structural problem for the Eurozone.

Debt ratios remain high, fiscal governance lacks legitimacy

Government gross debt ratios in the euro area have generally risen further, and the weak and uneven recovery with very low inflation has not been able to offer relief. The average for the Euro area is almost 100% of GDP.

At 2.5%, the average size of government deficits now satisfies the 3%-limit, but there are still worrying exceptions such as France

(2014 E 3.9%) and Spain (2014 E 5.6%). In theory, the union has created an impressive machinery to force fiscal discipline by way of the so-called 'two pack', the 'six-pack', the 'fiscal compact' and the macroeconomic imbalances procedure. In theory, the European Commission can impose sanctions (of a limited size) if its 'recommendations' (strictly speaking: 'binding judicial instructions' would be a more appropriate paraphrase). But the euphemistic wording is very significant. Fiscal governance by the European Commission lacks any democratic legitimacy. So most likely, the machinery will turn out to be a 'paper tiger'. The wilful violation of the Security and Growth Pact in 2003 by Germany and France does not augur well. All in all, fiscal governance won't assure sufficient discipline and lacks democratic legitimacy, probably inducing an upward bias in gross debt ratios.

Conclusion: fundamental problems remain

None of the fundamental problems of the euro crisis have been sufficiently addressed. This means that at some time in the future, the European debt crisis will likely return. European leaders appear to be lulled back into complacency, aptly illustrated by their initial embarrassing inability to fill their top jobs in July. The timing of a new crisis is impossible to predict and it can take a while thanks to the current upswing masking structural problems and the (conditional) willingness of the ECB to buy bonds of distressed sovereigns if the need arises. A new crisis could, of course, unleash a new determination to transform the current incomplete monetary union into a more complete monetary and fiscal union. Time will tell.

2. 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 them by using thorough empirical and theoretical research methods. We round expected returns up or down to the nearest quarter, i.e. 0.25% precision, and volatilities to the nearest 1%. The estimates should reflect the returns that investors should expect for 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 discuss those instances when costs actually do play a more significant 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

Next to estimates for asset classes, we provide estimates for factor premiums within credits, equities and commodities. Most of the factors that we discuss have been documented extensively in the academic literature. We 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 to the excess returns on these factors. Firstly, Chordia, Subrahmanyam and Tong (2013) argue that many popular equity-return anomalies have declined because the trend for trading these anomalies has highlighted their existence and subsequently made them less common. Secondly, trading costs might reduce the real-life profitability of these return factors.

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.² Since we also estimate the volatility risk of each asset class, 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 permitted expected return according to Dutch Pension Law and the volatility risk that is published by the Financial Services Authority in the Netherlands.⁴

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 Expected Returns 2013-2017 report of last year.
2. VBA (2010) Het toezicht op pensioenbeleggingen: Aanbevelingen van het VBA voor het FTK.

2.1 Inflation, cash and bonds

We start by investigating the 2013 database established by Dimson, Marsh and Staunton. For each of the 20 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 113-year period 1900-2012. Table 1 shows the results. We also calculate the average and a median for the 20 countries.

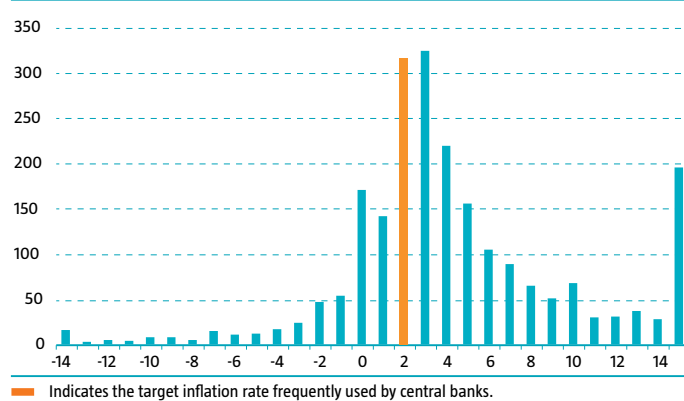
Inflation

Inflation around the globe has been significantly lower over the past two decades than was seen over the rest of history. Germany is an outlier due to 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,⁵ since this rate would be lower than has been 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 it has increased the potential labor force by more than two billion workers.

Another way of describing the history of inflation is to map all 2,260 inflation figures that we have for 20 countries over 113 years, see Figure 1. Using this method, as illustrated in the distribution frequency, it appears that inflation most often falls in the range of 2-3%, with 325 observations, and the median of these individual observations together comes in at 2.8%. Next, it clearly shows an asymmetric distribution: there are far more years in which inflation is above 2% than those when it is below 2%. A future distribution is likely to show the same asymmetry, as we have yet to meet the first central bank that will argue for targeting a period of deflation after a period of overshooting the target inflation rate, as this would detract from its ability to obtain its target rate.

Our view is that when making long-term predictions about inflation, investors should consider the past in addition to present inflation targets. We believe long-term inflation to be around 3% as a compounded average. That is in between the central banks' inflation target of 2% and the empirical reality of the 4.1% median compounded inflation rate

Figure 1: Distribution frequency of 2260 annual inflation data (1900-2012, 20 countries)



Source: Dimson, Marsh and Staunton (2013), Robeco

over the period 1900 to 2012. It therefore has the appearance of being a conservative estimate, below the 4.1% median or 6.3% average of the 20 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 distinguish different inflation expectations between 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%.

2.1.1 Cash

For cash we suppose the real rate of return to be ½%, 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 20 countries in our sample experienced negative real returns on cash.

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. Please note that inflation targeting usually takes place without exactly specifying what central banks target. 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%.

Table 1: Historical compounded returns for several markets over the period 1900-2012

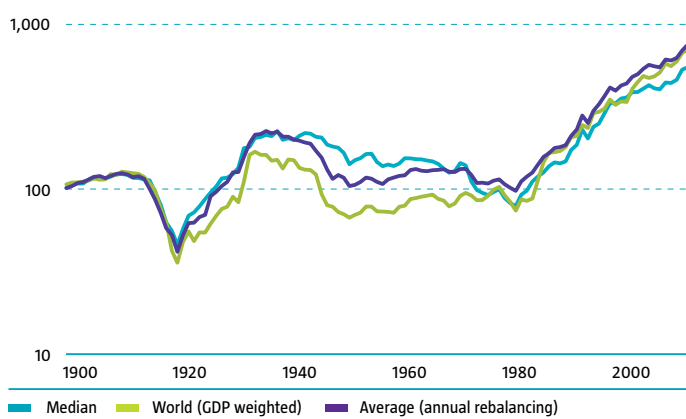
	Inflation	Real returns			Excess returns over cash	
		Cash	Bonds	Equities	Bonds	Equities
Australia	3.8%	0.7%	1.6%	7.3%	0.9%	6.6%
Austria	13.0%	-8.2%	-4.0%	0.6%	4.5%	9.6%
Belgium	5.1%	-0.3%	0.2%	2.5%	0.5%	2.7%
Canada	3.0%	1.5%	2.2%	5.7%	0.7%	4.1%
Denmark	3.9%	2.2%	3.2%	5.0%	1.0%	2.8%
Finland	7.2%	-0.5%	-0.1%	5.2%	0.4%	5.8%
France	7.1%	-2.8%	0.0%	3.0%	2.9%	5.9%
Germany	30.6%	-2.4%	-1.7%	3.1%	0.7%	5.6%
Ireland	4.2%	0.7%	1.2%	3.8%	0.5%	3.2%
Italy	8.3%	-3.6%	-1.6%	1.8%	2.2%	5.6%
Japan	6.9%	-1.9%	-1.0%	3.8%	0.9%	5.7%
Netherlands	2.9%	0.6%	1.5%	4.9%	0.9%	4.2%
New Zealand	3.7%	1.7%	2.2%	5.9%	0.5%	4.2%
Norway	3.7%	1.2%	1.8%	4.1%	0.7%	2.9%
South Africa	4.9%	1.0%	1.8%	7.3%	0.8%	6.3%
Spain	5.8%	0.3%	1.3%	3.4%	1.0%	3.1%
Sweden	3.5%	1.9%	2.6%	5.6%	0.7%	3.6%
Switzerland	2.3%	0.8%	2.2%	4.2%	1.4%	3.4%
United Kingdom	3.9%	0.9%	1.5%	5.2%	0.6%	4.3%
United States	3.0%	0.9%	2.0%	6.3%	1.1%	5.3%
World	3.0%	0.9%	1.8%	5.0%	0.8%	4.1%
Average	6.3%	-0.3%	0.9%	4.4%	1.1%	4.7%
Median	4.1%	0.7%	1.5%	4.5%	0.9%	4.2%

Source: Dimson, Marsh and Staunton (2013) Robeco

2.1.2 Government bonds

We suppose the real return on bonds to be 1.5%, which is the sum of a 0.5% real return on cash and a 1% term premium on bonds. Compared to earlier editions of our annual study, we have raised our estimate for the maturity premium from 0.75% to 1%. Now, instead of rounding down the term premium to ¾%, we level it up to 1%. We thereby arrive at a real return of 1.5% which is in line with the historical median but significantly below the 1.8% for the GDP-weighted global bond index. Due to the decent performance of bonds in recent history we have seen this figure creeping up, which would make a 1.25% real return estimate look very conservative compared to those achieved in the past. Still, we refrain from a further upward adjustment as we believe that real returns in the near future will be negative. This would bring down the real return on the global bond index. Our total expected nominal return on bonds amounts to 4.5%, as our expected long-term inflation rate is 3%.⁶ The estimate for the long-term return on bonds is 0.25% lower than our estimate of long-term economic growth. This is in line with the theoretical notion that nominal government bonds should yield a lower return than expected economic growth (see also Chapter Error! Reference source not found.). We still point out that the real return on bonds has not been gradually realized in the past, contrary to the real return on equities, as we will discuss later. As Figure 2 shows, real bond returns have roughly been 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 surrounded with more uncertainty than for equities.

Figure 2: Real return index for global bonds with different weighting methods



Source: Dimson, Marsh and Staunton (2013), Robeco

2.1.3 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 explain the reasoning behind this. We discuss the categories in order of historical data availability. Table 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) find a liquidity premium in credit spreads. The liquidity premium is estimated to be between 13 and 23 basis points by Houweling, Mentink and Vorst (2005).

We estimate the total risk premium of credits over government bonds at ¾%, 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 that can be found in corporate bond indices calculated and published by Barclays Capital.⁷ Over the period 1973-2013, the excess return for the Barclays Capital index amounts to 0.4%. Over 1983-2013, 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 index does not contain bonds shorter 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 additional return of approximately 0.4% 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 a similar spirit to the low-risk effect that is present in equity markets, recent research has pointed to a low-risk effect in credit bonds. This implies that credits with low distress risk and low maturity achieve the same returns as the credit bond market as a whole. Illmanen, Byrne, Gunasekera and Minikin (2004) focus on low-maturity credits. This low-risk effect for credit markets is investigated in more detail by Frazzini and Pedersen (2010). Moreover, a recent Robeco report entitled "The low-risk anomaly in credits" indicates that measuring credit risk using multiple dimensions leads to higher risk-adjusted returns for investors. Although this line of research suggests that the risk-return relationship might be inverse, our conservative assumption is that the expected return on the low-risk credit bond asset class is equal to the entire credit market.

2.1.4 High yield

High-yield bonds require a higher default premium than corporate bonds due to the lower creditworthiness of the issuers of subordinate debt and hence their higher risk profile. Altman (1998) also examines the return from US high-yield bonds compared to US Treasuries over the period 1978-1997 and found it to be 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, which leaves room for 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 1¾% premium over government bonds, assigning more weight to our sample than Altman's older sample.

6. 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.

7. We might be tempted to use the longer data series by Ibbotson instead of those of Barclays. However, Hallerbach and Houweling (2011) argue that the long-term credit series from Ibbotson is an unreliable source 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.

Table 2: Estimated excess returns for investment grade credits, high yield bonds and inflation-linked bonds

	Excess returns			Period
	over cash	over bonds	Volatility	
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

We still want to discuss the impact of transaction costs as a possible hindrance for investors 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 brings 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 his study reports an underperformance of 16 basis points for the average Exchange Traded Fund, 56 basis points for investment grade bonds, and no less than 384 basis points for high-yield funds. Obviously, the (il)liquidity of these asset classes demands extra attention for portfolio implementation. Passive index investing is likely to disappoint investors.

2.1.5 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 by a discount on the risk premium for inflation-linked bonds relative to nominal bonds. Theoretically, the

inflation risk premium should be positive. Over the last 15 years the inflation risk premium in the US has been negative, as shown in Table 3, as inflation-linked bonds earned a 1.0% higher return than nominal bonds. 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.⁸ 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%.⁹ On the basis of these findings we calculate the premium of nominal bonds over inflation-linked bonds at 0.25%. This results in an ex-ante estimated total nominal return of 4.25% for inflation-linked government bonds relative to 4½% for nominal government bonds.

2.1.6 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 is expected to grow in the years ahead. As data availability is limited, it is impossible to take a firm view on risk and return for these securities. Moreover, it is not a completely homogenous asset class.

In Table 3 we compare global government bonds, credits, high yield and EMD. We have created two baskets of EMD. Both baskets have a monthly rebalanced three-quarters weight in sovereign bonds in local currencies

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

9. For a sample of developed and emerging-markets 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 lower liquidity of inflation-linked bonds relative to nominal government bonds.

Table 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

and a one-quarter weight in EMD corporate debt issued in USD. The difference is whether one hedges the sovereign debt. Usually, investors take up some level of currency exposure. Without currency exposure, EMD has on average returned 7.0% a year in (roughly) the past 10 years, a 2.5% premium over (global developed) government bonds. With currency exposure, the return has been 11.2% and the premium has been 6.7%. With currency exposure, the standard deviation for EMD has been twice as high at 10.8% for unhedged portfolios versus 5.3% for those which are hedged. Ex-ante, we position EMD between credits and high yield for two reasons. Firstly, corporate USD-denominated debt, as well as unhedged local-currency sovereign debt, has shown standard deviations that are roughly in line with those of high yield. Secondly, the average credit rating for Treasury (AA2/AA3), euro credits (A1/A2), sovereign emerging debt (BAA2) and global high yield (BA3/B1) indicates that from a credit-rating perspective, emerging-market debt should also be placed between credits and high yield. After all, we estimate the emerging-market debt premium over government bonds at 1½%, 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 bonds than to credits. Once again, we stress that this asset class is young and dynamic and we consequently feel less certain about this estimate than for asset classes that have a longer history and more data.

As can be seen from Table 4, our expected returns generally differ 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 DNB is slightly more difficult, as they assume a maximum return of 4.5% on the entire fixed income portfolio instead of specifying expected returns on separate fixed income asset classes. Only when a fixed income portfolio is not too far tilted to assets with credit risk premiums do our expectations come close to those of DNB. 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 4: Long-term expected returns for fixed income asset classes, and changes relative to previous edition (arrows)

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	↑ 4.5%	5%	4.5%	4.50%	3.5%
Inflation-linked government bonds	↑ 4.25%	6%	4.5%	-	-
Investment grade credit bonds	↑ 5.25%	6%	4.5%	5.00%	5.0%
<i>Low-volatility credits</i>	↑ 5.25%	4%	-	-	-
Emerging government debt	↑ 6%	10%	4.5%	6.25%	10.0%
High-yield credit bonds	↑ 6.25%	12%	4.5%	6.75%	15.0%

* De Nederlandsche Bank (Dutch Central Bank)

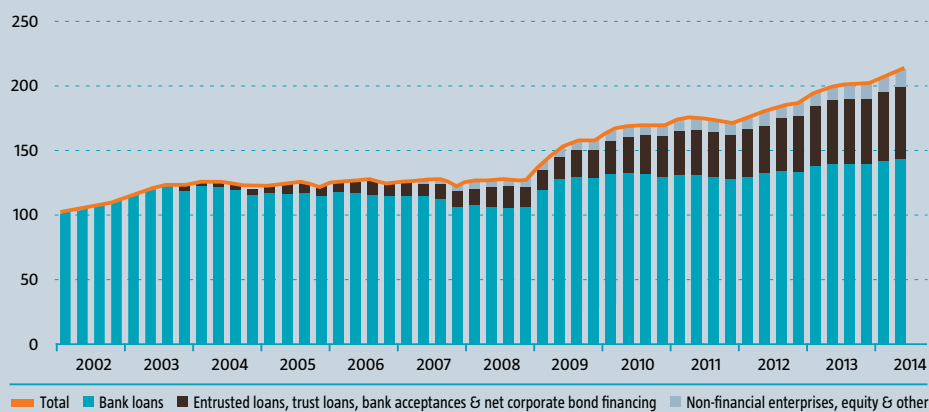
** Vereniging Beleggingsanalisten / Autoriteit Financiële Markten

Source: Robeco

In Focus: What if China slows down?

In some ways the rise of China is too good to be true. Its economy has grown with break-neck speed for decades (on average 9.1% since 1994; lowest 6%), if we can believe the official accounts. The Chinese authorities have recently begun to preach the need for a gradual rebalancing, making China less dependent on export growth and increasing domestic consumption. Nevertheless, the growth target remains a hefty 7.5%. After the Lehman-crisis, the Chinese authorities successfully prevented a sharp downturn, at the cost of a strong build-up of debt. This year, the economy was again struggling and the authorities quietly re-stimulated the economy, fuelled once more by strong credit growth. Estimates differ about the current level of debt as a percentage of GDP, but the trend is clear.

China's total social financing – As % of GDP

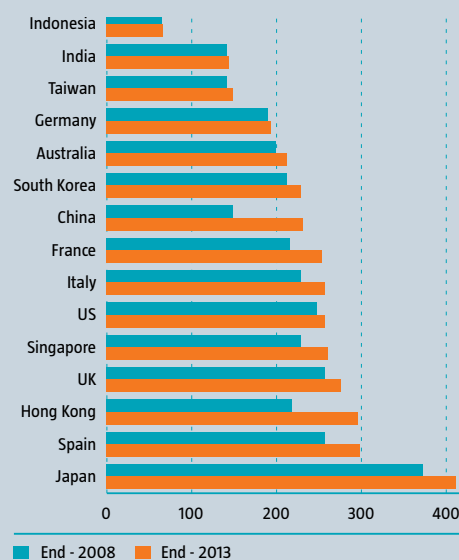


Sources: People's Bank of China; National Bureau of Statistics

Could this mean that China is on the brink of a financial crisis caused by a property crash, followed by a string of corporate defaults? This is not very likely in our opinion, although these fears are widespread and to a certain extent understandable. The notion of a possible 'hard landing' has been around for years. The rise of the most successful capitalist economy of

the twentieth century, the United States, is also known to have been interrupted by the Great Depression, so we should not expect the Chinese meteoric rise to go on smoothly forever. However, the Chinese economy still has important advantages enabling it to avoid a hard landing.

Debt to GDP ratios – Total debt as a % of GDP



Source: Standard Chartered

For instance, it has a low dependency on foreign debt (around 10% of GDP) combined with its impressive foreign reserves amounting to around 40% of GDP or USD 4 trillion. The external sector is therefore an unlikely trigger for a crisis. Furthermore, the domestic debt is to a large extent a consequence of state-owned banks lending money to state-owned companies. The Chinese government can easily prevent a credit crunch by forcing banks to continue lending. Apart from regular bank lending, China's shadow banking (or 'non-bank intermediation' to use a more neutral term) has shown rapid growth since the global financial crisis in 2008. It has more than tripled since 2008, albeit from a low base. As a consequence, shadow banking in China is relatively small in scale, both as a share of GDP and as a share of financial intermediation.

Government debt is low, and this allows the central government to absorb substantial problems if necessary. At the beginning of the year, the Chinese authorities accepted a bond

default and appeared to try to reign in the shadow-bank system for a couple of months. As this policy appeared to endanger the growth target, the authorities have since abandoned this attempt. Most likely, the overall debt ratio will continue to rise in the coming years, as policy makers will give priority to growth. In the long run, Chinese economic growth has to come down. The economy is still heavily dependent on investment, in 2013 the largest contributor to growth. Gross domestic investment is a staggering 47% of GDP in 2014. Parts of these huge investments are likely to be unprofitable and will have to be written off. The current rate of investment is unsustainable in the longer term, and is bound to come down. At the same time, domestic consumption must take over. As national savings from another staggering 49% of GDP in 2014, probably mainly due to the lack of a social safety net, there is ample room for increasing consumption. Compensating the inevitable slowdown in investments with a comparable increase in consumption won't be that easy to engineer and could easily provoke a recession.

Of course, events could take a different course, in which the Chinese authorities could decide to bite the bullet after years of futile warnings that such debt dependency is unsustainable. They could decide to curb debt growth decisively and let things run out of hand after a series of policy mistakes. While not very likely, this is not completely unthinkable. The question we wish to discuss further is that of the possible consequences for the world economy if Chinese growth should plunge to, say, 0%. As China is the world's second-largest economy - amounting to around 10% of world GDP on a purchasing-power parity basis - a severe slowdown would be felt worldwide. It would mean a negative global-demand shock, initially shaving 75% off world GDP growth.

But any future damage could be magnified by a number of factors. The following are a few of these:

1. China's largest trading partners (as observed from China's import side) would see their exports decline. These partners are in the order of magnitude of EU27, Japan, South Korea, Taiwan and the United States (in total 47% of Chinese imports). As China's principal imports in addition to electrical machinery are petroleum and derived products, the OPEC would take a severe blow.
2. As China is a major commodities importer, China's collapse would probably also mean a collapse of commodity prices, exacerbating the deflationary trends in the world economy. From an investor's point of view, this would increase the value of safe-haven bonds such as German bunds (helped by the inevitable quantitative easing) and of course US treasuries. It would be bad news for emerging-markets equities and probably equities in general.
3. From a regional point of view, China's collapse would be bad news for the Pacific region in particular. Problems could be exacerbated if the Chinese authorities steered towards a sharp depreciation of the yuan. Military tensions could also rise markedly, as confrontational action could be taken by the Chinese authorities to deflect public anger over the collapse towards external "aggressors".
4. At some point, the Chinese authorities could be tempted or forced to dump a significant part of their huge stock of US treasuries, provoking a sharp rise in US long-term interest rates, damaging the world economy further.

A sharp deceleration of Chinese growth could turn out to be a major earthquake, hitting the world economy, and eventually pushing it into a recession.

2.2 Equities

We again begin by using the data compiled by Dimson, Marsh and Staunton. For 20 countries, over the period 1900 to 2012, 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 5). Dimson, Marsh and Staunton (2013) have calculated a global risk premium of equities over cash with a new methodology using a broader dataset than before. They now use a market-capitalization world index instead of a GDP-weighted index and also take China and Russia into account. As a result, their calculation for the excess return of their global-equities index over cash and bonds has dropped compared to last year by 0.3% to 4.1% and 3.2% respectively. This drop comes after a year in which long-term risk premiums should have risen by 5-10 basis points due to the high realized equity-risk premiums in 2012.

The historical risk premiums may have been affected by changes in valuation between the start dates to the end dates of the data. Dimson, Marsh and Staunton (2013) show how expansion in the price-to-dividend

ratio has impacted the annual returns (see Table 11, Column 4 in their publication). Revaluation contributed at most 0.2% to the equity-risk premium.

In Chapter 1 we derive the ex-ante real global equity return from a theoretical point of view, which we estimate to be around 5%. Adding 3% inflation results in an estimate for the nominal total return of around 8%. This implies a risk premium of 4½% versus cash. This is exactly in line with the 4.5% average and median valuation-adjusted return figures from Table 5. However, this estimate is 0.8% above the figure for the world index and 0.5% above the median including Russia and China.¹¹ Relative to bonds, the theoretical estimate for the equity-risk premium would be 3½%, taking our bond-risk premium over cash of 1% into account. This is slightly higher than the historical valuation-adjusted average and median figures of 3.4% and 3.2% respectively. The figure for the world index and the median that includes Russia and China were below 3½%, coming in at 2.8% and 2.9% respectively.

Table 5: Historical returns for several markets over the period 1900-2012

	Excess return equities over			Valuation adjusted excess return equities over		
	inflation	bonds	cash	inflation	bonds	cash
Australia	7.3%	6.6%	5.6%	6.9%	6.2%	5.3%
Austria	0.6%	9.6%	4.9%	0.4%	9.4%	4.6%
Belgium	2.5%	2.7%	2.3%	2.3%	2.6%	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, and Staunton (2012), Robeco

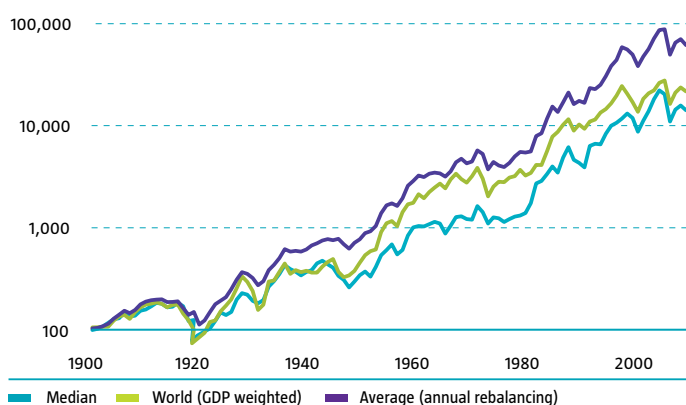
10. We did not include China and Russia in our table, as it impossible to calculate annual returns for markets where investors have lost everything in the past.

11. Although we cannot calculate the returns for China and Russia, we can calculate the median including these countries. Instead of picking the observation in the middle of the sample, we pick the country that would have been in the middle if we had added two countries at the bottom of the sample.

Taking new data and countries into account, we have decided to lower our estimate for the equity-risk premium for equities relative to bonds. Initially we keep to our 8% nominal-return estimate, which is in line with our theoretical approach. That leaves a real-return estimate of 5%, which is exactly in line with the real return of the world index over the period 1900-2012, and 0.4% above the valuation-adjusted real return. As we have raised our return estimate for bonds from 4¼% to 4½%, we implicitly lower our estimate for the equity-risk premium relative to bonds from 3¼% to 3½%. We refrain from lowering the risk premium further, as we believe the bond market to be significantly overvalued, with low or negative real returns lying ahead. Therefore, we expect equity-risk premiums to be above average in the near future. At a later stage, we believe that the Dimson, Marsh and Staunton (2013) data will show higher equity-risk premiums.

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 112-year horizon, real return has consistently followed an upward slope, as illustrated in Figure 3.

Figure 3: Real return index for global bonds with different weighting methods



Source: Dimson, Marsh and Staunton (2013), Robeco

We distinguish a separate equity-risk premium 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 Error! Reference source not found. 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 country. Since most emerging markets have become more integrated into global financial markets and country credit spreads have decreased substantially, the

estimated excess returns of emerging markets relative to developed markets have also decreased over recent years.¹¹ Hence, we assume that developed equity markets return 8% per annum and emerging equity markets return 8½%. For long-term expected returns, we do not discuss regional equity premiums separately. Our approach focuses on well-documented return premiums within global equity markets on small-cap, value, momentum and low-volatility stocks.

Table 7 contains the excess returns relative to the risk-free rate for the US stock market over the period 1963-2009. 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 that these stocks have, as measured by their beta and volatility as described by the Capital Asset Pricing Model (CAPM). 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. It should be noted that these estimates do not yet include transaction costs. This might be more of a 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 to a 3.0% CAPM alpha, is accompanied by 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 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 decision must be made on rebalancing frequency (cf. Blitz, Van der Grient and Van Vliet 2010) and the exact definition of the strategy parameters (cf. Blitz and Swinkels 2008). Hence, it is difficult to define a uniform value premium. For our purposes, we adopt the academically established definitions used by Fama and French (1992) for value and size, Carhart (1997) for momentum, and Blitz and Van Vliet (2007) for low-volatility stocks.

Table 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

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

Historical evidence for the US is overwhelming, and many authors have empirically detected the same return factors in other countries (cf. Rouwenhorst 1998, 1999); 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 the value premium relative to the market of approximately 3% per annum for the US over the period 1945-2005. Kim (2012) shows that over the period 1990-2010, 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 timescale that Fama and French (1998) analyze. Nevertheless, we take a conservative approach on excess returns for these return factors. This is motivated by trading costs that 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 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 ¼% 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 we believe that the factor premiums are present in all markets, we do not include them separately 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 to emerging and frontier markets. For example, as value stocks have a 1%-percentage point higher return than the market as a whole (9% versus 8%), the expected return for value stocks in emerging markets is 9½%. This is the same 1%-point higher than the 8½%.

Table 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.

2.3 Alternative asset classes

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.

2.3.1 Private equity

Many recent studies have attempted to compare the returns of private equity with those of listed equities. Kaplan and Schoar (2005) find that private equity does not outperform, with a public market equivalent (PME) of 0.96 for all funds. Phalippou and Gottschalg (2009) draw a comparable conclusion using 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, they find outperformance for the 1990s and underperformance in the 1980s and the 2000s. Robinson and Sensoy (2011) also find outperformance for buy-out funds over the period 1984-2010 versus the S&P 500. 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), Phalippou (2012) indicates that the results from their studies largely derive 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

Table 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%	8.00%	17.5%
Value stocks	9%	20%	7%	-	-
Small stocks	8¼%	22%	7%	-	-
Momentum stocks	9%	22%	7%	-	-
Low volatility stocks	8%	13%	7%	-	-
Emerging markets	8½%	25%	7%	8.50%	22.5%

Source: Robeco

Table 8: Estimated excess returns for private equity, real estate and hedge funds

	Excess returns			Period
	over cash	over equities	Volatility	
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

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 a period when it is least desired.

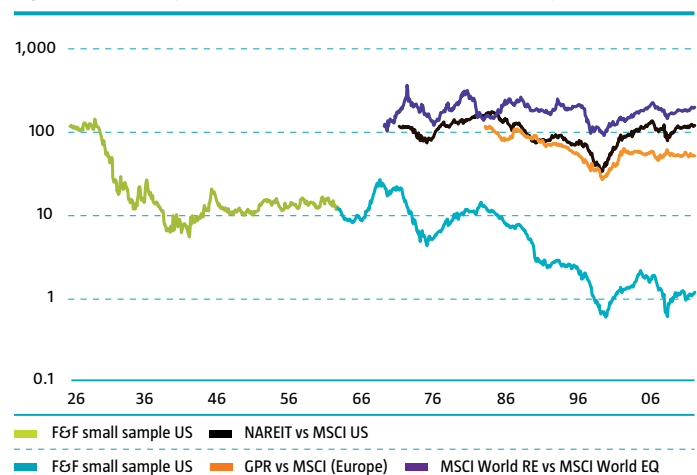
Although Table 8 shows an outperformance for private equity over stocks in the period 1998-2013, we do not have enough evidence from existing literature that private-equity returns (net of fees) exceed public-equity returns. There is no consensus in the academic literature. Most studies point to an outperformance by private equity, but the question remains what is left on the table after a proper risk adjustment. 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.

2.3.2 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 8.

As Figure 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 which share the same country allocation for real estate and equities. Even with the same country weightings, the 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 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.

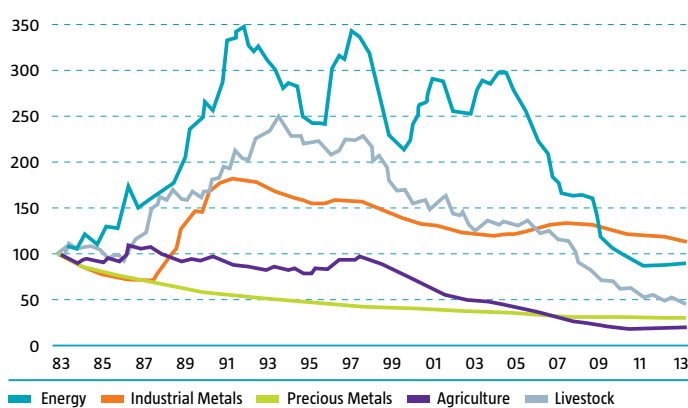
2.3.3 Commodities

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 return. 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.¹³ 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 benefit comes from periodically rebalancing the portfolio and is reflected in the high historical performance of the S&P GSCI commodity-markets index compared to the return from individual commodities.

Gorton and Rouwenhorst (2006) create an equally weighted monthly rebalanced portfolio of commodity futures that realized returns comparable to 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 5). However, over roughly the past 10 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 become positive again. 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.¹⁴

Figure 5: Roll returns for commodities (EUR)



Source: Thomson Financial Datastream, Robeco

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 ½% relative to cash.

Recent research suggests that 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) 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 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 10 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 10 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 10 years of the sample. The volatilities of the momentum and carry premiums were found to be 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 (cf. Locke and Venkatesh (1997)).

Although the 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. Further, we took the premiums of similar factors for equities into account, as these have a longer existence than the ‘freshly’ reported factor premiums for commodities. We focus on generic factors in this study, while in practice, less naïve approaches can be used to construct the factors, such as those using more advanced portfolio construction techniques and aiming for optimal roll returns by investing further down the curve. Table 10 illustrates the estimated excess returns and volatilities. We assume that returns of the momentum and carry premium are 1½% higher than the commodity-market premium, with similar volatilities as the commodity market factor. As the reported factor

13. 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.

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

Table 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)

premiums for commodities are larger than those for equities, we have put excess returns for these commodity-factor premiums relative to the commodity market ½% higher (at 1½%) than the equity-factor premiums relative to the equity market (1%). For low-volatility commodities, we assume similar expected returns as the market, but with a substantially reduced risk of 15% instead of 25% for the commodity market. Table 10 summarizes our estimates for the commodity market and the commodity factor premiums.

2.3.4 Hedge funds

Table 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 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

Table 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

Table 11: Biases in hedge fund data bases

	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

of fund portfolio to be between 1.3% and 2.9%. There is no cheaper way to obtain exposure to this asset class.¹⁵

Taking all this together, we believe the estimate of Bekkers, Doeswijk and Lam (2009) to be reasonable, with an excess return over cash of 1¼%. Note that this is a combination of possible manager skills and the systematic exposures that hedge funds seem to have.

When we compare our expected returns in Table 12 to those estimated by DNB (De Nederlandsche Bank) and VBA (Vereniging Beleggingsanalisten)/AFM (Autoriteit Financiële Markten), 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%. Exceptions are hedge funds, for which we assume a slightly lower volatility of 10% compared to the VBA/AFM's 12.5%.

Table 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%	6.50%	22.5%
Indirect real estate	7%	20%	7%		
Direct real estate	6%	10%	6%	6.50%	8.0%
Hedge funds	4¾%	10%	7.5%	7.00%	12.5%

Source: Robeco

15. 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.

In Focus: Do liquidity premiums exist?

In the search for attractive return characteristics, investors might consider the area of less liquid investments. Amongst these, investments in hedge funds, real estate, private equity, and infrastructure are probably those most widely known. However, specific bonds or stocks (e.g. small-cap stocks) can also be fairly illiquid. When a certain asset is illiquid, it is usually difficult to find a counterparty to trade with at a reasonable price. Sometimes it can even be impossible to trade. In addition, the costs that come with transactions in illiquid assets can be substantial.

Investing in illiquid assets carries additional risks. Probably the best known example of problems resulting from large positions in illiquid assets is the Harvard University's endowment case (Ang, 2014). During the turmoil in 2008, the endowment made a big loss on its assets. The liquid part of the portfolio had become too small to meet the running expenses. In need of cash, the Harvard endowment tried to sell some private-equity investments. Although this was possible, they faced 50% discounts in the secondary market. All in all, Harvard showed the world the dark side of having a large part of a portfolio invested in (very) illiquid assets.

Why liquidity premiums could exist

All else being equal, it would be fair to assume that an investor would always prefer a liquid investment over an illiquid one. So what is the reason for the sometimes large investments in illiquid assets made by some institutional investors? The answer to this question should be related to being rewarded for making these less liquid investments. The reward is usually called the 'liquidity premium', the existence of which has been the subject of lively debate between practitioners and academics. Another cited reason for investing in illiquid assets is the

existence of (perceived) diversification opportunities. Below we cover certain aspects of illiquidity and the corresponding premiums. The demanded liquidity premium will vary per investor according to the segmentation theory. We use a simplified numerical example from De Jong and Driessen (2013) to illustrate how this theory works. Suppose there are short-term investors (1-year horizon) and long-term investors (10-year horizon). These investors have two assets to invest in, a liquid asset with normal transaction costs (1%) and an illiquid asset with high transaction costs (5%). The risk-free rate is set at 2% in our example. Furthermore, we assume that the assets are risk-free. Short-horizon investors have no interest in illiquid assets, owing to the high transaction costs. They will therefore tend to hold liquid assets. The gross return on these assets should be the risk-free rate plus compensation for trading costs. This is equal to 2% (risk-free) + 1% (trading costs) = 3%. If long-horizon investors decide to hold liquid assets for 10 years, they earn a yearly net return of 3% (gross return illiquid asset) – 1/10 * 1% (trading frequency * trading costs) = 2.9%. Note that the trading costs are divided by 10, as the long-horizon investor only trades once every ten years. This means that the long-

term investor earns an excess return of 0.9%. Therefore, an illiquid asset needs to generate at least equivalent returns to coax long-term investors to invest in it. To obtain a net return of 2.9%, gross return should equal 3.4%. This return compensates for the transaction costs of 1/10*5% (trading frequency * trading cost) = 0.5%. Even in a stylized model like this we observe that long-term investors should obtain a liquidity premium (in gross return) to remain on a par with a liquid investment.

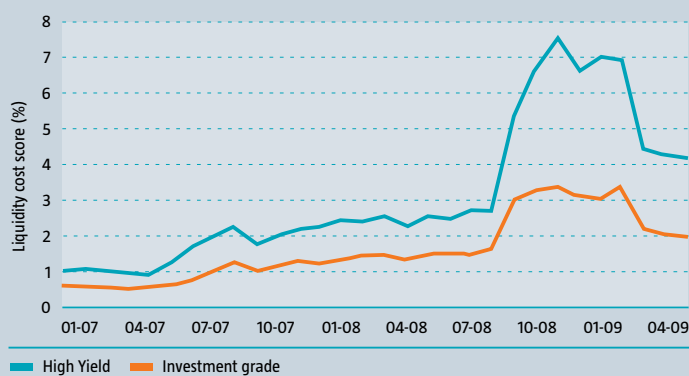
In reality, of course, there are many more effects involved, which determine the existence and size of liquidity premiums. Amihud, Mendelson and Pedersen (2005) summarize different sources of liquidity premiums, while Vayanos and Wang (2012) focus on asymmetric information and imperfect competition as sources of liquidity premiums. If, for instance, some traders have different information to others, this could lead to illiquidity, as there is a possibility of entering into a bad deal. The interplay between many variables that determines the reward for bearing illiquidity risks makes it hard to derive the exact size of a liquidity premium theoretically. However, the academic literature seems to agree that a liquidity premium should theoretically exist. It is also essential to understand that liquidity varies considerably over time. In quiet times, liquidity might be abundant. However, we saw that during the credit crisis, even the money markets which are usually very liquid, became illiquid. In the same period, the transaction costs on corporate bonds increased dramatically (see figure below).¹

Asset allocation

Ang, Papanikolaou and Westerfield (2014), and Driessen (2014), both provide an asset-allocation model that takes illiquidity into account. Both studies conclude that illiquidity has a negative impact on holdings in risky assets. However, Ang et al. (2014) find a substantially greater negative impact, as they

1. Brunnermeier and Pederson (2008) show that it is the relationship between funding and market liquidity that explains why liquidity could dry up so suddenly.

Liquidity cost score (%)



Source: Barclays Capital

take intermediate consumption into account (“the probability of having nothing to eat”), while the latter only looks at terminal wealth after 10 years. According to Ang et al. (2014), an investor’s holding in a risky asset would decrease from 60% in the case of full liquidity to 35% if the risky asset can only be traded once a year on average. If the risky asset can only be traded once every five years, which corresponds to real-life examples from private equity and real estate, they find an allocation of 10% to be optimal.

Empirical evidence

Although theory predicts an illiquidity premium, we will now establish whether this is also found in practice. There seems to be empirical evidence for the existence of a liquidity premium (see Ang, 2014, and De Jong and Driessen, 2013, for a summary of the literature). For the sake of brevity, we will not

discuss every liquidity premium found, but will instead give examples of premiums to clarify the findings from both studies.

In fixed income, the yield on government-guaranteed agency bonds can be substantially higher than the yield on government bonds, while the (default) risk is the same because the agency bond is backed by the same government. In the corporate-bond world, it is found that the bonds that are less liquid often realize a higher return. For equities, liquidity premiums have been observed over a longer time span, but have become reduced in the recent past. Also, within the illiquid asset classes such as private equity, hedge funds, and real estate, there seems to be some evidence that longer lock-up periods result in higher returns. An institutional investor could therefore benefit from such liquidity premiums if the investment horizon is long enough to compensate for the expected transaction costs.

Across asset classes, there seems to be less evidence for the existence of liquidity premiums. This might sound surprising, as alternative asset classes are known for their high returns. A lively debate to establish whether or not private equity outperforms public equity (see for instance Driessen, Lin and Phalippou, 2012) is therefore ongoing. Research on returns from these illiquid asset classes is hampered by a lack of high-quality data, which adds to the difficulty of finding evidence on the existence of liquidity premiums.

Moreover, in large part, investing in these illiquid assets involves betting on a specific manager and is therefore a form of active investing. Whether you invest in asset classes such as private equity, real estate or hedge funds therefore depends whether you believe in manager-selection skills and in these asset classes carrying a liquidity premium.

Amihud, Y., Mendelson, H. and Pedersen, L.H., 2005, “Liquidity and asset pricing”, *Foundations and Trends in Finance*, 1:269-364.

Ang, A., 2014, “Asset Management: A Systematic Approach to Factor Investing”, Oxford University Press

Ang, A., Papanikolaou, D., Westerfield, M.M., 2014, “Portfolio Choice with Illiquid Assets”, forthcoming *Management Science*

Brunnermeier, M.K. and Pedersen, L.H., 2009, “Market Liquidity and Funding Liquidity”, *Review of Financial Studies*, 22(6):2201-2238

De Jong, F.C.J.M. and Driessen, J.J.A.G., 2013, “The Norwegian Government Pension Fund’s Potential for Capturing Illiquidity Premiums”, Tilburg University research for the Norwegian Ministry of Finance

Driessen, J.J.A.G., 2014, “Illiquideit voor pensioenfondsen en verzekeraars”, Netspar Design Paper 26

Driessen, J., Lin, T.-C. and Phalippou, L., 2012, “A New Method to Estimate Risk and Return of Non-traded Assets from Cash Flows: The Case of Private Equity funds”, *Journal of Financial and Quantitative Analysis*, 47(3):511-535

Vayanos, D. en Wang, J., 2012, “Liquidity and Asset Prices under Asymmetric Information and Imperfect Competition”, *Review of Financial Studies*, 25:1339-1365

3. Economic growth &

Long-term economic growth derives 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 the financial returns for investors. Hence, we firstly discuss labor productivity and labor-force growth rates. We then turn to economic growth and earnings growth. We finish with the theoretical implications this has for equity and bond returns in the long-term steady state.

3.1 Labor productivity

Labor productivity in a mature economy grows roughly 1.5% to 2% per year. To determine productivity gains, one can look at the real growth in gross domestic product (GDP) per capita. In the long run, this matches the increase in labor productivity, if we assume that hours worked per capita remain constant. As illustrated in Figure 9, per capita real GDP growth is surprisingly stable in the long term for the US and the UK.¹ Leaving aside the case of catastrophes, the speed of technological innovation has been rather gradual. According to data from Magnus Maddison for a wider set of 20 Western countries, growth in GDP per capita has averaged 1.9% over the period 1870 to 2008. Before 1870, there are no annual data. With decennial data, this figure becomes 1.7% for the period 1820-2008. Developing economies can temporarily show higher growth rates for labor productivity. For example, Japan has experienced a 3.6% increase since 1952. However, as the economy matures, productivity gains are harder to realize. For the period 1980 to 2009, Japan showed an increase in labor productivity of 1.7%, precisely in-between the 1.6% for the US and the 1.8% for the UK. Finally, as an example of high productivity gains in emerging markets, China currently enjoys annual productivity gains of, on average, 8.6%. 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 period. It should be noted that these numbers are average real GDP-per-capita growth rates, and that there can be significant differences between countries. For example, growth lies in the low range of 0.5% to 1.4% in Venezuela, Peru, Argentina and New Zealand, while impressive real per-capita growth of around 6% is seen in countries such as Singapore, South Korea and Taiwan.

financial markets in the steady state

In summary, as the labor productivity of a mature economy grows roughly by 1.5% to 2% per year, we estimate labor productivity in developed markets to grow at an average rate of 1.75% in the long run. We do not share the view of commentators such as Robert Gordon that the past two centuries of economic growth might actually amount to just “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. Temporarily, in less mature markets, productivity growth can be higher. On a 10-year horizon, we can very well imagine global labor-productivity growth to be 2½%, but in the (very) long run, close to 2% seems us to be a better estimate.

3.2 Size of the labor force

The labor force is usually defined as the population aged between 15 and 65. In the future, the age cohort from 65 to 70 years probably will also have to be taken into account. The only way to fund aging in a meaningful way is to shorten the time lived in retirement. Here, we make use of United Nations statistics and apply the usual definition for an age cohort between 15 and 64 to describe the potential labor force. Not taking into account rising retirement ages might imply that we underestimate the future labor force somewhat. Over the last two decades, growth of the 0-14 age cohort has been decelerating in all regions of the world with the exception of North America, where it has remained at an annual 0.7%. Projections show a deceleration in all regions, with no exceptions. Given these developments, it is no surprise that the rate of growth in the global population is flattening. The potential labor force is still on the rise. But, like global population growth, it is flattening. Figure 10 illustrates declining birth rates and the decelerating growth of the potential labor force. We estimate that the global labor force increases by ¼% per year, while in Europe the size of the labor force is already declining. We assume, in accordance with Cornell (2012), that changing demographics are taken into account by market participants in their current market valuations. However, we do not expect the equity-risk premium to be materially affected going forward. Therefore, we do not use the insights of Arnott and Chaves (2012). In our opinion, the empirical evidence for a material impact on the level of the equity-risk premium is weak. For example, in Chapter 5 of our 2011 Expected Returns 2012-2016, we show that demographics did not help in selecting the right countries in which to invest.

3.3 Economic, earnings and dividend growth

The previous section contains our global economic-growth projections. In this section we wish to make the link to corporate earnings. In the very long term, earnings growth for the total economy should equal economic growth, otherwise the share of corporate earnings will approach zero if they grow at a slower rate than the economy as a whole, or the share of earnings will approach one if they grow faster than the economy as a whole. Both extremes are unlikely outcomes; see also Cornell (2010).

A more interesting question is: how much do earnings per share grow? Imagine a closed economy that grows 2% a year in real terms. Total earnings also grow 2% a year. Earnings-per-share growth is less than 2% per year, as economic growth comes partly from new activities. These new activities can come from new or existing companies. Existing listed companies are not entitled to all of these earnings, and for the part to which they are actually entitled, they may issue new shares to fund their new activities. In other words, economic growth is diluted by existing shareholders. The question here is: How extensive is this dilution?

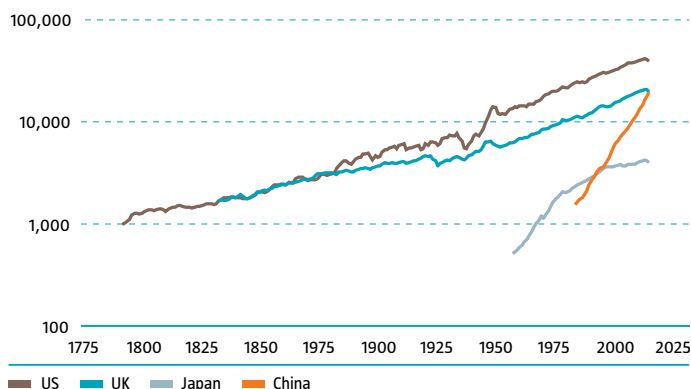
We have made an equity-dilution analysis from 1871 to 2010 with earnings and dividend data from Robert Shiller’s website and economic-growth data from MeasuringWorth.² Table 15 shows the compounded growth rates.

Table 1 also contains a comparison with the US data from the Bernstein and Arnott (2003) study over the period 1900 to 2000. Bernstein and Arnott (2003) estimate the dilution to be a stunning 70% for their sample of 16 countries over the period 1900 to 2000! Average real GDP growth for non-war countries is 3.0%, while real dividend growth equals only 0.6%. This produces a 2.3% dilution, which is 70% of total dividend growth. Our analysis for the period 1871-2010 suggests an 11% dilution for earnings per share. We believe that earnings per share is a better measure with which to calculate dilution than dividends per share, as share buy-backs are not accounted for properly when measuring dividend per share, and dividend policy has been changed considerably by tax regulations. Our analysis for the period 1900-2000 suggests a 37% dilution for dividends and 22% dilution for earnings, as shown in Table 15. We cannot explain why the data from Bernstein and Arnott (2003) for the US is different from ours. Unfortunately, we have not been able to consider other countries with another dataset from a different source to compare the outcome with the result from Bernstein and Arnott (2003).

1. There is no such thing as ‘true’ economic growth, and consequently the same applies to labor productivity. Bear in mind that measuring GDP involves statistical choices that influence results. For example, since 1996, the United States has used a chain-weighted method to calculate GDP. Before the switch, Young (1993) presented three alternative weighting systems to determine GDP, where GDP-growth rates varied between 2.88% and 3.16% over the period 1959-1992. The differences are not substantial. However, Maddison (2003) notes that the difference between the new chain-weighted method and the traditional method over the period 1929-1950 amounts to 0.9% per year, i.e. 3.5% versus 2.6%. This difference is substantial. As he justifiably states: “Acceptance of the new measure for this period would involve a major reinterpretation of American history.” So, using historical data always brings a margin of error, or as Dimson, Marsh and Staunton (2002, p. 156) state: “GDP estimation today is far from the precise science many imagine, but back in 1900 it was excessively crude.”

2. <http://aida.econ.yale.edu/~shiller/data.htm> and <http://www.measuringworth.com>.

Figure 1: Real gross domestic product per capita (index)

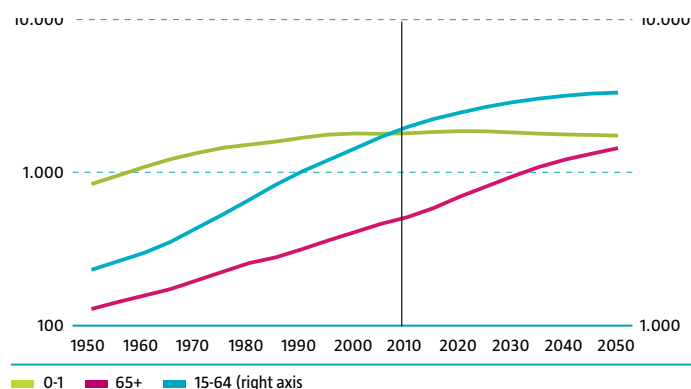


Source: Measuringworth, Robeco

Based on these empirical results, we assume that economic growth estimated at 2.25% is diluted 0.75%-points (or 33%) to an earnings-per-share growth rate of 1.5%. This 33% lies between the historical dilution of 11% that we find for earnings per share and the 40% dilution for dividend per share. Our assumption leaves 1½% dividend growth for shareholders based on estimated earnings growth.

As another check on the dilution factor, we examine sector weightings over time. This indicates how fast new sectors get their piece of the economy and how fast existing sectors lose their dominance. Clearly, this is no direct measure for dilution. For example, innovation by start-ups could also take place in existing sectors, while existing companies might shift their activities to new sectors without dilution. Nevertheless, this analysis might help to get an understanding of what a reasonable dilution level could be. As a start, we keep it simple and we suppose that existing sectors represent the 'old economy' without further dilution, and

Figure 2: Global population by age cohort



Source: UN, Robeco

that new sectors are the 'new economy' that results in total dilution for shareholders in the 'old economy'.

Table 2 shows three scenarios for three different rates of dilution, i.e. 75%, 50% and 25% earnings-per-share dilution from real per capita GDP growth. Here, we assume an economy that grows 3% a year. Economic growth comes from annual productivity gains of 2% and growth of 1% in the labor force. Such an economy corresponds well with the historic full-sample data from Bernstein and Arnott (2003).

The outcome of the first scenario comes close to the result of the earnings-dilution analysis for the US performed by Bernstein and Arnott (2003). In this scenario, existing sectors have a weight in the total economy of 29% after 50 years and 9% after 100 years. The third scenario comes close to the level of EPS dilution seen in our analysis. Here, existing sectors have a weight in the total economy of 48% after 50 years and 23% after 100 years.

Table 1: Dilution of earnings per share and dividends per share in the United States

Period	Source	Real			Dilution	
		GDP-per-Capita	Earn-per-Share	Div-per-Share	Earn-per-Share	Div-per-Share
1900-2000	Robeco	2.0%	1.6%	1.3%	-22%	-37%
1871-2010	Robeco	2.0%	1.7%	1.2%	-11%	-40%
1900-2000	Bernstein and Arnott (2003)	2.0%	-	0.6%	-	-70%

Source: Robeco

Table 2: Scenarios of dilution from economic growth for earnings

	Start	Scenario 1 75% dilution		Scenario 2 50% dilution		Scenario 3 25% dilution	
		+50 years	+100 years	+50 years	+100 years	+50 years	+100 years
Existing sectors	100%	29%	9%	38%	14%	48%	23%
New sectors	0%	71%	91%	62%	86%	52%	77%

Source: Robeco

Table 2: Equity-market sector weightings using end-1899 classification

Industry classification	1899	1950	2000	1899	1950	2000
Railroads	49.2	0.0	0.3	62.8	4.2	0.2
Banks and finance	15.4	9.7	16.8	6.7	0.7	12.9
Mining	6.7	5.3	2.0	0.0	1.1	0.0
Textiles	5.0	3.3	0.0	0.7	1.3	0.2
Iron, coal, steel	4.5	5.4	0.1	5.2	0.3	0.3
Breweries and distillers	3.9	8.8	2.1	0.3	0.7	0.4
Utilities	3.1	0.2	3.6	4.8	8.3	3.8
Telegraph and telephone	2.5	0.0	14.0	3.9	6.0	5.6
Insurance	1.9	11.5	4.4	0.0	0.4	4.9
Other transport	1.4	1.7	1.5	3.7	0.3	0.5
Chemicals	1.3	6.3	0.9	0.5	13.9	1.2
Food manufacturing	1.0	4.6	2.0	2.5	2.0	1.2
Retailers	0.7	7.3	4.4	0.1	6.7	5.6
Tobacco	0.0	13.1	1.0	4.0	1.5	0.8
Small sectors in 1900	3.4	22.8	46.9	4.8	52.6	62.4
Total	100	100	100	100	100	100

Source: Dimson, Marsh and Staunton (2002), Robeco

Dimson, Marsh and Staunton (2002) report a table, reproduced below, that shows sector weightings for the US and the UK over a 101-year period. In the US, small or previously non-existing sectors have seen their weights increase from 4.8% to 52.6% in 51 years and 62.4% in 101 years. For the UK, these numbers are 3.4%, 22.8% and 46.9% respectively. Averaging these numbers produces figures of 4.1%, 37.7% and 54.7% for new sector weightings at the start, after 50, and after 100 years respectively. However, these data are not suitable for direct conclusions, as one has to make assumptions about the part in sector-weight changes that comes from 'the undiluted old economy'. On the assumption that all of the new sector weights go to 'new shareholders' and that all of the existing sectors remain for 'old shareholders', these data do not even come close to the 25% dilution scenario shown in Table 16, in which existing sectors only have a 23% weight after 100 years. Apparently, even if one supposes complete dilution from new sectors (which is a rather bold assumption), one still has to add dilution from existing sectors (which is logical, as new market entrants can also enter existing sectors).

It is impossible to draw firm conclusions from the sector table of Dimson, Marsh and Staunton (2002), but at least it shows that new sectors do not easily gain importance relative to the total economy. From this point of view, 70% dilution from Bernstein and Arnott (2003) seems (too) high. Therefore, we maintain our assumption that there is 1½% dividend growth.

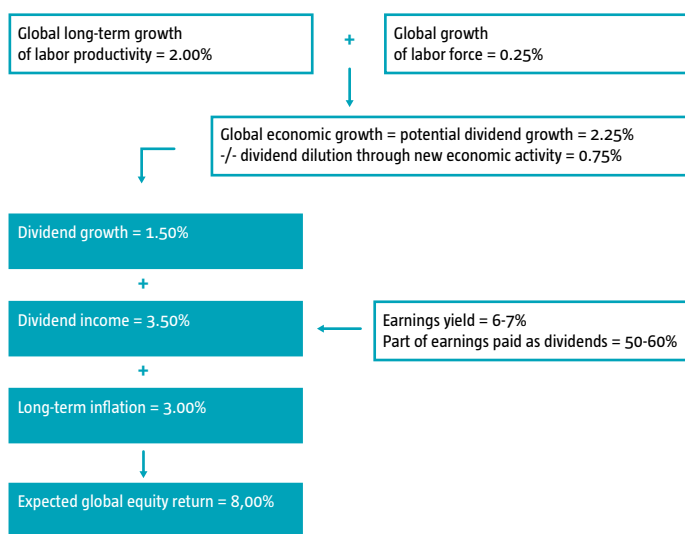
3.4 Equity returns in a macroeconomic context

In the steady state, the real return on stocks equals the dividend yield plus the dividend growth rate. We suppose the dividend payout ratio to be roughly 50-60%. For the US, the Shiller database suggests that the average payout ratio has been 62% and the median 58% over the period 1871-2013. For the MSCI World Index, the average and median dividend payout ratios have been 47% since 1970. The average earnings yield for the US since 1871 has been 7.5%; the median comes in at 6.9%. For the world since 1970, these figures have been 6.5% and 5.9% respectively. Using these data, a typical dividend yield for the US is around 4% while it is around 3% for the world. Taking both samples into account, we estimate a long-run dividend (or stocks buy-back) income of 3.5% for stocks.

It is easy now to derive the real return on equities. We add the dividend yield of 3.5% and the dividend growth rate of 1.5% to arrive at a real return of 5% for global equities.

Figure 3 presents a schematic overview of the theoretical building blocks for global-equity returns. In this overview we use our mostly empirically-based estimate of long-run inflation. 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. The latter can be divided in long-term inflation rate and the real growth rate of dividends. The theoretical return on equities that we derive for the steady state is 8% per year. This expected return in nominal terms is the sum of company earnings that we split between dividend

Figure 3: Schematic overview of the theoretical building blocks for global equity returns



Source: Robeco

income of 3½%, real dividend growth of 1½% and a long-term inflation rate of 3%. The dividend income is motivated by a typical 6-7% long-term earnings yield with a payout ratio of roughly 50-60%. The dividend growth is derived from long-term economic growth of 2%-2¼%, of which 1½% is earned by equity holders. In turn, global economic growth is achieved by 2% growth in labor productivity and a ¼% growth of the labor force.

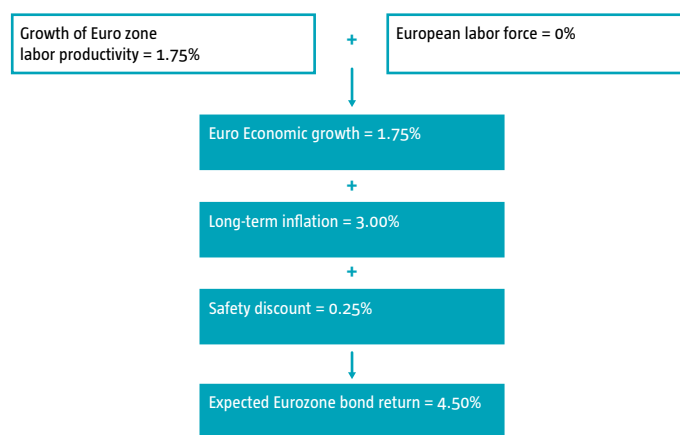
3.5 Economic growth and interest rates

The relationship between economic growth and interest rates is far from clear in the academic literature. Most studies focus on the steepness of the yield curve and its predictive power regarding (the lack of) economic growth. For example, Ilmanen (2011, Section 16.4.1) indicates that in many instances an inverse term structure of interest rates is a good predictor of economic recession. The overview book on expected returns by Ilmanen (2011) does not specify anything about equilibrium interest rates. The concept of a natural rate of interest is discussed by Williams (2003) of the Federal Reserve Bank of San Francisco, and Andersen (2005) of the Federal Reserve Bank of St Louis. The basis of this theory is unpublished work by Wickseil, 1898, in which he states that:

“There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them.”

Cornell (2012) describes a model that states the expected risk-free interest rate to be a function of time preference, per-capita consumption growth, aggregate risk aversion, and the volatility of per-capita consumption growth. When, in addition, it is assumed that real economic growth translates into real consumption growth, it follows from this model that interest rates should be lower in aging societies that have lower economic growth per capita.

Figure 4: Schematic overview of the theoretical building blocks for euro zone government bond returns



Source: Robeco

Several other methods have also been developed to estimate the (constant or time-varying) natural interest rate, without much empirical success. The lack of theory makes it difficult for us to estimate such a rate for the purpose of our study. Nevertheless, based mostly on empirical findings from our long-term expected returns section, we set the natural real interest rate at ¼% below potential GDP growth. This implies that the expected real growth of 1¼% leads to a real interest rate of 1½%. We motivate this choice by the relatively low risk involved when investing in government bonds, as opposed to the growth of the real economy. Hence, there is a safety discount for investing in government bonds, with less risk than investing in economic growth. Figure 12 presents a schematic overview of the theoretical building blocks for Eurozone government-bond returns. In this overview we use our mostly empirically-based estimate of long-run inflation.

3.6 Inflation

Most economic theories take a real (i.e. inflation-adjusted) perspective on economic growth. Money is often seen as a unit in which prices of goods are displayed, but carries no information by itself. This is known as ‘money illusion’, which refers to the tendency of people to think of money in nominal, rather than real, terms. Since fiat currencies have no intrinsic value, people suffering from money illusion would mistakenly take the nominal value as its real value or purchasing power. As there is empirical evidence by behavioral economists that people suffer from money illusion in certain circumstances, most inflation theories have been written recognizing this phenomenon (e.g. sticky prices). Unfortunately, as far as we know, there is no research claiming that a theoretically optimal level of inflation exists. Hence, our estimate of long-run inflation is primarily based on empirical observations. This empirical analysis is described further in Chapter 3.1.

In Focus: Five-year themes

We have seen how expected returns depend on continuing economic recovery that will affect all asset classes differently. But what are the issues on a five year horizon that are likely to determine the states of world we envisage? Our strategists have identified four themes that we view as prevailing throughout the next five years and probably beyond. These are a gradual normalization of economic conditions; the ebbing of the deflation scare; a return to volatility in markets; and continuing divergence between different emerging markets.

Gradual normalization

Recovery after the global crisis may be taking unusually long from a historical perspective, but we do not think that it will be any different this time: the nature of the recovery is fundamentally characterized by gradual normalization, not by a back-slide into a stagnating world economy. However, as we judge the nature of the normalization to be gradual, there will be temporary setbacks and (re) accelerations. We therefore think the market will still be given some ammunition in the coming years to remain occupied with the bond-bullish themes that are currently influencing market views, such as secular stagnation and the 'new normal', but to a lesser extent.

The deflation scare will ebb, but not vanish

As a general remark, deflation should always be just a temporary phenomenon in a monetary system that is not linked to a real asset like gold, as long as a central bank is determined to go all the way. With the ECBs 'whatever it takes' standpoint, the current deflation scare will ebb. The factors that will eventually pave the way are a lower euro, higher consumer spending, a banking sector that will gradually recover, thereby restoring the monetary transmission mechanism, and abating austerity-/reform-induced disinflation. Although inflation will return to levels more consistent with the ECB mandate of 'below, but

close to 2%', the path will be rough. Structural reforms, commodity prices and exchange rates will trigger volatility around our upward-sloping inflation path and will provide the occasional ammunition for deflation bears. So the deflation scare will ebb, but not vanish altogether.

The return of volatility

Volatility has been low over the past year, helped by the assurance by central banks that they will supply the market with ample liquidity. The return of interest rates that correspond more typically with the phase in the economic cycle will also bring back risk perception and lower complacency. The awareness of higher rates could enter the market quite briskly and suddenly, causing

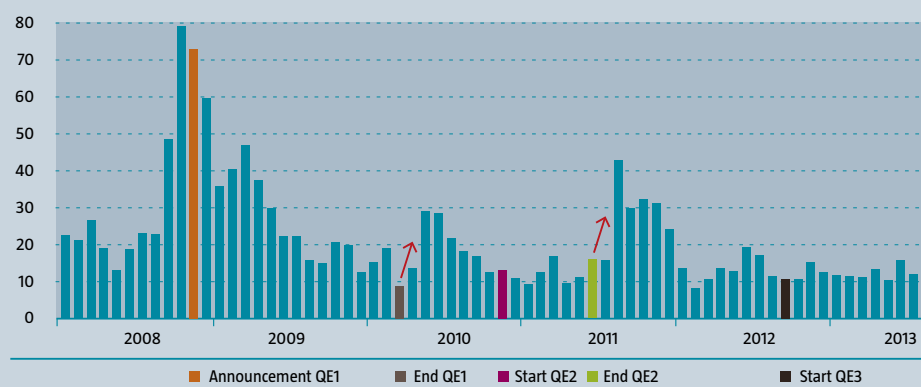
volatility, but has the advantage that it will also prevent a fundamental disconnection between pricing and earnings growth in equity markets. For instance, in the current stage of recovery, the market reacted with higher volatility only after the actual withdrawal of QE1 and QE2, realizing that it had to adapt to a possible new stance on monetary policy.

Emerging market divergence

Emerging markets are becoming more mature, and this leads to greater diversity within this investment universe. We expect continuing divergence within emerging markets according to differences in export orientation, current account balances, fiscal and monetary policies and political stability.

Taken together, our strategists view these themes as setting the wider tone for markets and returns over the next five years and beyond. While there is some debate about the relative power and influence of each individual trend, most economists agree that they cannot be taken in isolation. The trend towards renormalization, for example, goes hand in hand with a decrease in the deflationary threat, while increasing market volatility. It is perhaps the final trend in emerging-market divergence that will prove the most difficult to predict, thereby making it potentially the most interesting for investors.

Figure 1: Volatility S&P 500



Source: Bloomberg, Robeco

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