

**WHAT SOLUTIONS DOES
THE INSURANCE SECTOR
HAVE IN THE FACE OF
EUROPE'S LOW INTEREST
RATE ENVIRONMENT?**

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EXECUTIVE SUMMARY

In early 2015, the European Central Bank (ECB) decided to engage in Quantitative Easing in order to avoid a deflationary spiral. Our objective, after showing how this low interest rate environment presents a real challenge to the insurance industry, is to propose solutions to deal with this situation. We recall the principal theoretical mechanisms at work and carry out a comparative analysis with other historical episodes of quantitative easing in the United States, the United Kingdom and in Japan. Unlike some of these examples, we highlight the difficulties faced by the ECB in trying to pre-emptively raise interest rates based on expected inflation. The euro area seems, at least in the medium term, destined to stagnate in a low interest rate and low inflation environment. We detail the dangers posed by low rates on both the life and non-life insurance sector, and we look at possible strategic solutions to limit risk. We show that optimal asset-liability management is proving more than ever to be the appropriate response to a deteriorated macroeconomic situation for insurance companies. We study the possible techniques for increasing the duration of asset portfolios and reducing the duration gap between assets and liabilities. In particular, we study the benefits of insurers returning to real estate investment or other less traditional assets in order to reduce this duration gap.

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INTRODUCTION



INTRODUCTION

For several years now, the European economy has seen a sharp decline in interest rates. This process began in 2008, with a reduction of the European Central Bank's key interest rates. Today, rates are close to zero, or even negative depending on the country and the durations. This factor, combined with a lack of inflation in the euro area, is fuelling fears of a liquidity trap and deflation, as seen in Japan in the 1990s. In early 2015, the ECB decided to engage in Quantitative Easing in order to avoid this type of deflationary spiral. It is an ambitious asset purchase programme of the ECB, intended to flood European financial institutions with liquidity. By moving to reduce interest rates, and in particular long-term rates, the ECB hopes to revive investment, private demand and consequently bring inflation back to its historic target of 2%.

Our goal is to analyse how this low interest rate situation presents a real challenge for the (life and non-life) insurance industry, and to determine what solutions are available to adapt to this context. This environment has just further aggravated the problem of declining portfolio returns, already complicated by the Solvency II prudential regulations that favour less risky assets and the evolution of European IFRS accounting rules that stiffen management. Currently, insurers are facing increased exposure to interest rate risk which translates into many challenges: managing of the sensitivity gap between assets and liabilities which has been accentuated by Solvency II and the increased volatility of spreads; the conundrum of reinvesting bonds nearing maturity, coupons and new insurance fund inflows; financial margin

pressures and competitiveness compared to other investments. These problems are all the more acute for guaranteed rate and/or annuity contracts, and for corporations with the significant asset-liability mismatch.

The article is separated into two parts. In the first part, we analyse the macroeconomic consequences of quantitative easing on the interest rate curve and inflation. We recall the principal theoretical mechanisms at work and present a comparative analysis with other historical episodes of quantitative easing in the United States, the United Kingdom and in Japan. Unlike some of these examples, we highlight the difficulties faced by the ECB in trying to preemptively raise inflation expectations. The euro area seems, at least in the medium term, destined to stagnate in a low interest rate and low inflation environment. In the second part, we detail the dangers that low rates pose for insurers and the available strategies for limiting risks: modification of the commercial offering for existing contracts (renegotiation of existing guarantees, transferring savings to other contracts that are less sensitive to interest rates) and for the collection of new premiums (adjustments or even cancellations of guarantees, unit-linked and/or structured products); adjustment of the economic model (reducing operational costs, strengthening preventive reserves, adjusting interest rate risk hedging) and, in particular, managing the duration gap between assets and liabilities. We show that optimal asset-liability management (i.e. based on a increased control of the duration mismatch and a diversification strategy) is proving, more than ever,

to be the most appropriate response insurance companies have for dealing with a deteriorated macroeconomic situation. We identify the possible techniques for increasing the duration of asset portfolios and reducing the duration gap between assets and liabilities. In particular, we look at the importance of insurers returning to real estate or other less traditional assets (covered bonds, asset backed securities, mortgages, commercial and agricultural loans, collateralised loan obligations, public or private loans, direct or indirect lending, alternative investments such as private equity, LBOs, infrastructure, hedge funds) to reduce this duration gap.



**THE ECONOMIC
AND FINANCIAL EFFECTS
OF THE ECB'S
QUANTITATIVE EASING**



THE ECONOMIC AND FINANCIAL EFFECTS OF THE ECB'S QUANTITATIVE EASING

OVERVIEW OF THE POLICY

On 22 January 2015, the ECB Board of Governors announced an expansion of its asset purchase programmes. This Expanded Asset Purchase Programme (EAPP or quantitative easing, hereafter QE) combines the continuation of the asset-backed securities purchase programme (ABSPP), the covered bond purchase programme (CBPP3) and the public sector purchase programme (PSPP). Securities purchased must have a remaining maturity of at least 2 years and a maximum of 30 years. From March 2015 until September 2016, the combined monthly asset purchases amounts to €60 billion,¹ or a total of roughly €1.1 trillion worth of securities purchased over the period. Unlike some exceptional measures taken by the ECB in recent years, these interventions will not be sterilised, meaning that the ECB will not simultaneously engage in selling securities in order to neutralise the effects of the programme on the size of its balance sheet. On the contrary, the clearly identified objective is to increase the size of the ECB's balance sheet.² The balance sheet level fell below €2 trillion in the last quarter of 2014, while it had been above €3 trillion in 2012. This decline is specific to the euro area, because the balance sheets of other central banks continued to grow during that same period. In theory, QE in Europe should shrink the balance sheet size to levels seen roughly three years ago.³

The main aim of QE is to combat deflationary risk in the euro area. The ECB must ensure the stability of prices (Price Stability Mandate) which,

for the Board of Governors, means annual growth of the consumer price index lower than but close to 2% in the medium term. In January 2015, the rate of inflation fell to -0.6%,⁴ a long way from the official target (see Figure 1). This was its lowest level since July 2009 (also -0.6%), a period during which the euro area was in recession. Although the pace of price growth increased slightly during 2015, it fell back down to -0.1% in May 2016. Many economic actors are questioning whether QE will permanently remove the prospect of a deflationary spiral.

In this section, our goal is to provide theoretical and empirical elements to understand the possible effects of QE in Europe. Our analysis will focus on the reaction of the financial markets (and sovereign rates in particular), as well as on macroeconomic indicators (inflation of course, but also growth). Given the lack of historical perspective, we have three possibilities for predicting the effects of QE: (1) we can analyse the results of many unconventional ECB measures since 2008 (even if all are not QE); (2) we can detail the effects of QE policies recently implemented in other monetary zones (in the United States, Japan and the United Kingdom); (3) we can proceed with a descriptive study of the initial effects of QE in the euro area since its announcement, and also since its effective implementation.

Following a theoretical section covering the expected effects of a QE policy on key economic and financial indicators, we will conduct the

1 - The policy has since been extended.

2 - This is why we talk of "Quantitative Easing": the target of the policy is the size of the Central Bank's balance sheet and thus implicitly the amount of liquid assets in circulation. An asset purchasing policy with sterilisation leads to a qualitative change in the nature of the Central Bank's balance sheet, without changing the amount of liquid assets in circulation (otherwise known as "Credit Easing").

3 - Some measures to boost the ECB balance sheet had already been taken in the second half of 2014.

4 - This evolution is in comparison to the level of prices 12 months earlier (i.e. in January 2014).

Figure 1: Evolution of the rate of inflation since 1997 for the euro area (dark blue) and the EU (light blue). Source: Eurostat



three empirical analyses described above. We will conduct a literature review of the impact of unconventional monetary policies in Europe since 2008, QE policies carried out by the Fed, the Bank of Japan and the Bank of England. Lastly, some of the statistical techniques used in this literature will be applied and used to discuss the effects of the ECB's QE policy.

QUANTITATIVE EASING: THEORETICAL TRANSMISSION MECHANISMS

In a stable macroeconomic environment, central banks usually steer monetary policies with the intent of controlling short-term interest rates. Typically, open-market transactions – ECB-approved short-term liquidity loans, short-maturity bond purchases – will affect the interbank rates and the amounts of cash available for banks. This drop in short-term interest rates and expansion of the Central Bank's monetary base⁵ can then, via different transmission channels, stimulate the economy (increase in the growth rate of real GDP, consumption, boost the inflation rate, etc.). This effect may be triggered by an increase in the supply of bank credit or by a wealth effect

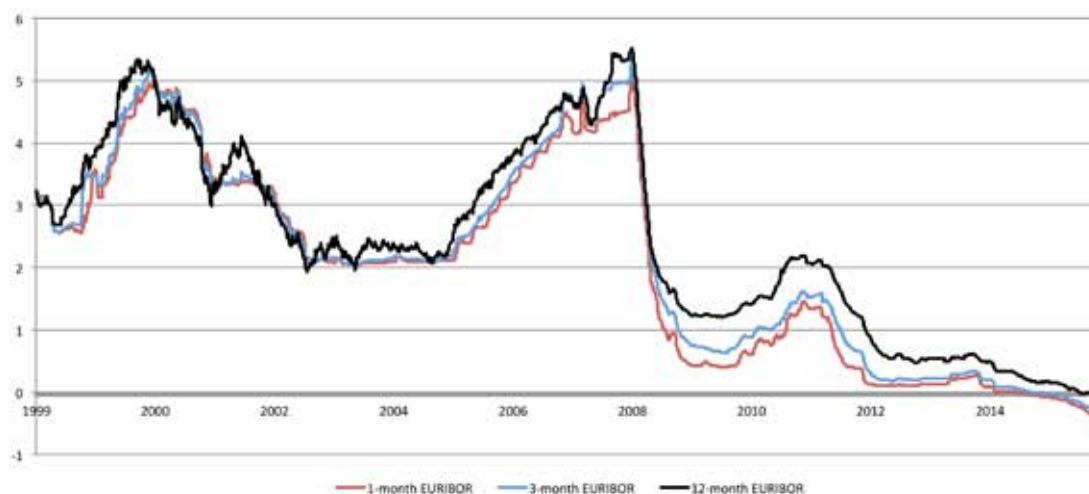
(an increase in the share prices, real estate values, etc.) that will encourage investment and/or consumption.

Such measures taken by the central bank are classed as "conventional" monetary policy. However, these open-market policies become ineffective when, as is currently the case in the euro area, short-term interest rates are zero (or even negative). For example, Figure 2 charts the evolution of the 1-, 3- and 12-month Euribor rates. The first two turned negative in early 2015, as did the 12-month Euribor in February 2016.

Similarly, the sovereign bond yield curve is negative for maturities less than or equal to 5 years (see below). In this context, it would be difficult for further cash injections to bring (already very low) short-term interest rates even lower. Given their low return, agents are practically indifferent between holding cash and holding short-term bonds given their low returns. They have no incentive to invest their liquid assets: this situation is known as a *liquidity trap*.

5 - The monetary base is defined as the total currency in circulation and level of bank reserves held by the central bank.

Figure 2: 1-, 3- and 12-month Euribor in %. Source: ECB.



To get out of this trap, the central bank can use other tools: unconventional monetary policies. One of them is *Quantitative Easing*, which has two objectives: a massive expansion of the central bank's balance sheet and an attempt to affect medium- or long-term rates rather than only the official short-term rates. Within conventional monetary policy, the size of the central bank's balance sheet is a means and not an end. It is used to reach the target rate. In the case of QE, the target becomes the size of the balance sheet itself, and thus the amount of bank liquidity reserves. The term QE was first used in reference to Japan in the 1990s. At the time, the Bank of Japan (BoJ) had set an official balance sheet target. The goal was to flood banks with liquid cash reserves in the hope of reviving the distribution of credit. Additionally, in order to affect long-term yields, QE can involve purchasing long-maturity private or government assets (see historical action taken by the USA and the UK, in examples presented below), which does not necessarily fit into a conventional monetary policy. The relaxing of long-term interest rates can trigger a revival of investment (with equally long-term horizons).

Several articles have studied the theoretical mechanisms supporting the theory of QE's effect on long-term interest rates. All the potential transmission channels were identified by Krishnamurty and Vissing-Jorgensen (2011), Joyce et al. (2012) and Fawley and Neely (2013). Here, we revisit the main elements.

The *Signalling Channel* affects the yield curve. Normally, in order to reassure the markets, the central bank can commit to keeping its key interest rates very low in the long term. The Forward Guidance policy applied by the ECB in 2013 follows this logic. It involves providing sustained guidance for agents' expectations on short-term rates by committing to not increase them for an extended period. If the commitment of the central bank is deemed credible, the expected low level of future short-term anticipated rates will play a role in bringing down long-term interest rates. However, many economists (Eggertsson, 2006) feel that such action is generally ineffective: markets often expect the central bank to go back on its commitments as soon as the macroeconomic environment improves. In this case, QE may

give credibility to the central bank's action. If it purchases a significant amount of long-term bonds, which are carried onto its balance sheet, it will see the value of these securities drop if rates were to rise again (a drop in the price of the bonds). If markets believe that the central bank is not indifferent to its bond portfolio losing value, QE can be interpreted as a signal of key interest rates remaining low for an extended period of time.

The *Portfolio Balance Channel* is probably the most studied in the literature. Following large-scale purchasing of long-term securities by the central bank, the reserves held by commercial banks increases. The available supply of long-term securities for private investors has dried up while liquid assets are more widely available. Yet, some of these investors are not indifferent between these two types of assets. For example (see Joyce et al., 2012), pension funds or insurance companies that are structurally built for long-maturity liabilities have a preference for holding assets of comparable maturity. The depletion of the stock of long-term securities for these investors means a lowering of term premiums and an increase in the price of long-term securities. Therefore, the magnitude of the portfolio channel depends on investors who are sensitive to the duration of their portfolio.

By extension, the theoretically bearish effect of QE on long-term rates can have effects on the real economy via the relaxation of credit markets: lower credit risk premiums, the wealth effect for businesses or households candidates looking to obtain credit (for which the value of bond portfolios has increased), etc. All these conditions would likely lead to a surge in domestic demand and thus in economic activity.

Indirectly, if QE succeeds in stimulating the economy, other transmission channels may have an effect on rates. So, a return to growth should theoretically reduce the risk of default. The risk premium of corporate bonds (which is usually higher than that of sovereign bonds), must be reduced, particularly those of the lowest-rated bonds (*Default Risk Channel*). Moreover, in a favourable macroeconomic environment, the degree of investor risk aversion must also decrease, which would contribute to further reducing risk premiums.

In addition, the announcement of a QE policy being implemented is likely to influence the inflation expectations of agents (*Inflation Channel*). QE must a priori contribute to increasing the interest rate on inflation swaps, as well as inflation expectations (as measured by the difference between nominal bond yields and TIPS⁶). This should push nominal rates upwards. Lastly, if the effects of QE on inflation expectations are easy to interpret, the effects of QE on inflationary uncertainty are much more complex. The literature is divided on this point: in theory, given the lack of historical references, investors have had difficulties in anticipating the magnitude of QE's effects on inflation, which serves to increase the uncertainty. At the same time, this type of monetary policy is conducted to prevent the risk of a deflationary spiral. Limiting this type of risk helps to limit inflationary uncertainty. As detailed by Krishnamurty and Vissing-Jorgensen (2011), only a study of the data can help determine if QE increases or decreases inflationary uncertainty, and thereby interest rate uncertainty.

6 - Treasury Inflation Protected Securities.

UNCONVENTIONAL POLICIES OF THE ECB SINCE 2008

Since the 2007/2008 financial crisis, the euro area was hit by a sovereign debt crisis that started off in Greece and spread to other countries. The consequences of this succession of crises are visible both in major macroeconomic indicators (poor growth, deflationary risk, growing fiscal imbalances, the drying up of credit, etc.) and in financial markets (surge in the sovereign interest rate differentials among euro area countries). The ECB found itself in a very particular situation where it had to simultaneously deal with several troubles: the prospect of a decline in prices, the poor operation of the interbank market, massive cash withdrawals by applicants in some countries and lastly, the exposure of the banking system to sovereign risk. In these exceptional circumstances, the monetary authority of the euro area decided to roll out unconventional measures to sustain activity, particularly in the banking system.

We begin with a (brief) history of exceptional decisions taken by the ECB since the subprime crisis. In 2008, following the collapse of Lehman Brothers and the initial tension on European interbank markets (rising spreads⁷), the ECB implemented the *fixed-rate full allotment* (FRFA) facility. This meant that major refinancing operations (weekly operations providing liquidity to European banks) were executed at a fixed rate and that all liquidity needs of banks would be met.⁸ This facility was then extended to *Long-Term Refinancing Operations* (LTRO), typically with a maturity of 3 months and remains in force to date.^{9,10} This was a first exceptional measure providing liquidity to banks in the euro area, intended to relax interbank rates and reassure markets about liquidity reserves and the composition of bank balance sheets. We

note that, at the same time, the ECB's key interest rate (the one used in major refinancing operations) had been substantially reduced (see Table 1). It went from 3.75% before 15 October 2008 to 0% since 16 March 2016. Since then, the overnight deposit rate has been at -0.4%. These reductions were very marked during the 2008/2009 period with a 1% rate in May 2009. These measures on key interest rates were not exceptional per se, but helped to strengthen the impact of FRFA.

Subsequently, between 2008 and 2011, the ECB implemented other unconventional measures specifically intended to shore up banks' liquidity levels. The maturity of the LTRO was exceptionally extended: 6 months, 1 year, then 2 tenders for 3 years (under FRFA) at the end of 2011 and in early 2012. This last measure was outside the norm given the extended duration of the loans and the unlimited nature of the cash amounts being granted. Although temporary (these were not outright purchases by the ECB, but repurchase agreements with collateral or *repos*), these operations resembled QE: the ECB balance sheet grew significantly, going from less than €2 trillion in early 2011 to more than €3 trillion by mid-2012. However, as pointed out in a report by the French Board of Economic Analysis (CAE), a large part of these 3-year LTROs was repaid early by banks, which has helped to significantly reduce the ECB's balance sheet since 2013.

Despite the unusual amounts of these loans, the situation of interbank market was still worrying in 2009. The ECB then began making outright purchasing operations (later than other central banks, including the Fed and the BoJ) with the *Covered Bonds Purchase Programme 1* (CBPP1) in 2009, the *Securities Market Programme* (SMP)

7 - In October 2008, the 3-month Euribor-OIS spread peaked at 198 basis points, reflecting the perceived increase in counterparty risk within the interbank markets.

8 - In the past, these operations were executed at a variable rate and the amounts of cash available at each tender were capped.

9 - Except for a brief period in 2010 when the LTROs reverted to variable rates.

10 - On 5 June 2014, the Board of Governors of the ECB announced that FRFA would continue for "as long as necessary" for major refinancing operations. With respect to 3-month LTROs, FRFA was maintained until December 2016.

Table 1: Changes in the ECB's key interest rates (in %, Source: *Banque de France*)

Date	Major refinancing operations	Permanent facilities	
	Fixed-rate tenders	Overnight deposit rate	Marginal lending rate
16 March 2016	0.00	-0.40	0.25
9 December 2015	0.05	-0.30	0.30
10 September 2014	0.05	-0.20	0.30
11 June 2014	0.15	-0.10	0.40
13 November 2013	0.25	0.00	0.75
8 May 2013	0.50	0.00	1.00
11 July 2012	0.75	0.00	1.50
14 December 2011	1.00	0.25	1.75
9 November 2011	1.25	0.50	2.00
13 July 2011	1.50	0.75	2.25
13 April 2011	1.25	0.50	2.00
13 May 2009	1.00	0.25	1.75
8 April 2009	1.25	0.25	2.25
11 March 2009	1.50	0.50	2.50
21 January 2009	2.00	1.00	3.00
10 December 2008	2.50	2.00	3.00
12 November 2008	3.25	2.75	3.75
15 October 2008	3.75		

in 2010 and the *Outright Monetary Transaction* (OMT) announced in 2012. The CBPP1 involved buying covered bonds (mainly issued by credit institutions) to facilitate access to long-term refinancing for banks and thus supporting the distribution of credit. Two new similar programmes – CBPP2 and CBPP3 (see above) – were launched in 2011 and 2014, respectively. The SMP allowed the purchase of government bonds on the secondary market.¹¹ The aim was, of course, not to help countries in difficulty to issue public debt, but “to ensure the depth and liquidity of the dysfunctional market segments”. By relaxing the sovereign rates, the ECB was also supporting the banking system, which was very exposed to the public debt of euro area countries.

In 2012, the OMT continued with this monetary policy of purchasing sovereign debt, but with a few adjustments compared to the SMP: the OMT is presented as “unlimited” (in terms of time and amounts) while the SMP was temporary and limited. Moreover, countries whose sovereign debt would be bought under the OMT framework had to accept the programme of economic recommendations of the European Stability Mechanism¹² (formerly the European Financial Stability Facility).

It should be noted that the three securities purchasing programmes described above were sterilised: in parallel, the ECB conducted reverse open-market operations designed to reabsorb the liquidity injected by the CBPP, the SMP and the OMT. The ECB thus ensured control over its

11 - This decision was a departure from ECB mandate, which must not, theoretically, contribute to monetising the public debt of euro area countries. By comparison, the Fed is permitted to buy US Treasury bonds.

12 - The ESM is an intergovernmental organisation intended to help countries in difficulty following a financial crisis, and it has the ability to raise funds on financial markets.

standard monetary policy: the composition of its balance sheet has changed, but not its size. In this sense, it was more a case of *Credit Easing* rather than QE in the purest sense.

Lastly, other unconventional measures were announced more recently: the Forward Guidance policy in 2013 was intended to anchor market expectations about the evolution of monetary policy. In 2014, the Targeted Long-Term Refinancing Operations (TLTRO) certainly marked the return of the ECB's willingness to increase the size of its balance sheet and the volume of cash in circulation. This is a transitional measure (they are repos) with the limits already set at 3 years for the FRFA or for LTROs. While the first¹³ TLTRO in September 2014 was not a success (with only €82.6 billion being allocated), it seems that subscription volumes are rising (almost €100 billion allocated for the third TLTRO in March 2015), which contributes to boosting the ECB balance sheet.

A large empirical literature has detailed both the financial and economic effects of these exceptional measures in the euro area. With regard to the financial markets, many studies have looked at the impact of the recent ECB decisions on: (1) the interbank markets, (2) the covered bond markets and (3) the sovereign bond markets. The interbank market rates do not appear to have been significantly affected by the first wave of exceptional liquidity measures in 2008/2009 (the FRFA and the first extensions of LTRO maturities) as shown by Angelini et al. (2011) and Brunetti et al. (2011). On the other hand, Szczerbowicz (2014) showed that subsequent and stronger liquidity expansion measures (the 3-year LTROs combined with near-zero key interest rates) significantly

impacted the interbank spread. The Euribor-OIS spread fell 24 basis points within the 2 days following the announcement of the 3-year LTRO. However, the effect of the CBPP, the OMT and the SMP (all sterilised) was much less pronounced and generally not significant.

The covered bond market was significantly affected by CBPP1. Beirne et al. (2011) highlight a significant decline in primary and secondary secured bond yields. They also highlight a substitution effect: a lot of unsecured bond issues were replaced by secured bond issues following the introduction of CBPP1. These results are confirmed by Szczerbowicz (2014), who also shows that CBPP1 has contributed to lowering *sovereign* debt rates.

The announcement of the SMP in 2010 seems to have had an impact on the sovereign spreads rate¹⁴ of the countries left most exposed by the crisis (a drop of 485 bps for Greece, 121 bps for Ireland and 202 bps for Portugal according to Szczerbowicz, 2014). The sovereign rates of France and Germany were not affected. Overall, the impact of the announcement of SMP across the entire euro area was limited: 16 bps. Similarly, De Grauwe and Li (2013) established a significant link between the spreads of 10-year sovereign rates and the announcement of the OMT in 2012. Countries that saw their spread fall significantly in 2012 were those who initially had the highest spreads.¹⁵ Here again, the effects of the OMT announcement at the European level remain modest (a drop of 14 bps according to Szczerbowicz, 2014). Other studies (Eser and Schwab, 2013; Ghysels et al., 2013) have analysed the impact of the SMP on sovereign rates and agreed on its significance. It should be noted that so-called "event studies" techniques were applied in most of this literature: this involves detecting any

13 - Subscriptions are run on a quarterly basis.

14 - This relates to interest rate spreads of 10 years.

15 - And not necessarily those who have implemented the most drastic austerity measures in 2012.

abnormal rate movements, on or close to the date of a major event or a political announcement.¹⁶ This means that all of the proposed results are valid only in the very short term. While the literature highlights a decline in interbank, sovereign and covered rates following the different exceptional measures taken by the ECB, there is nothing to say that this drop is sustainable over horizons of more than a few days.

Studies that offer to estimate the *macroeconomic* effects of monetary policies are much rarer. Although financial markets studies make use of daily data that allows for a detailed assessment of investor reaction on the same day as a political announcement, economic studies use quarterly or annual data. This makes it more difficult to identify the effects of a political announcement: in the space of a quarter or a year, several major economic or political events may have occurred. The transmission mechanisms of monetary policies, via their effect on rate spreads, on inflation or on GDP, were highlighted from 2010 onwards. According to different items, the first QE-type measures taken by the ECB (FRFA and the extension of LTROs that led to a significant increase in the size of the balance sheet) in 2009 had a significant effect on the European economy in the form of reduced interbank rates. According to a counterfactual analysis by Lenza et al. (2010), the QE of 2008 has led to (1) a 200 bps decline of the 3-month Euribor, and (2) a flattening of the yield curve.¹⁷ As the Euribor serves as a base for many private credit contracts, this is likely to affect private demand. However, the transmission of these effects to the real economy is slow: gains of 2 percentage points on industrial production over the next 2 years. The effect on inflation takes even longer to manifest (almost 3 years) and remains very low (less than 0.2 percentage points). In

contrast, the effects on the distribution of credit (including real estate and consumer credit) are almost immediate and huge.

The advantage of the policies adopted by the ECB at the beginning of the crisis is that they combined quantitative and qualitative aspects. The size of the ECB balance sheet grew considerably (QE of 2008) and, at the same time, the nature of the loans granted by the ECB has changed. This has allowed the liquidity reserves of banks to be boosted (classic monetary channel) and simultaneously affected the yield curve (signalling channels and the portfolio composition). According to various observers (Bénassy-Quéré et al., 2014; Orphanides, 2014), it is the fact that most unconventional ECB policies (CBPP, SMP, OMT) were sterilised, coupled with early repayment of LTROs that, via the shrinkage of the ECB balance sheet, partly explained the poor performance of Europe's economy compared to that of the US (the Fed's balance sheet has not shrunk since 2008 and continued to grow in 2013 and 2014).

The SMP or the OMT were certainly unconventional, but non quantitative programmes. They enabled the ECB to modify its asset composition, thereby extending its average maturity. But bank liquidity reserves were not affected. The lack of effect that these sterilised measures had on interbank rates (and their weak impact on bond yields) may explain the absence of transmission of the OMT or the SMP to GDP or inflation.

However, this analysis is disputed by some (Veld, 2013; Constancio, 2015) who feel that the stalling of the European economy is in part related to the magnitude of the fiscal consolidation taking place

16 - The time windows used rarely exceed 5 days (i.e. 2 days before the announcement, the day of the announcement and the following 2 days).

17 - This means that (1) the 3-month Euribor is 200 bps below the level it would have been without QE and (2) the gap between the 12-month Euribor and the 3-month Euribor is narrower than it would have been without QE.

in the euro area. The cumulative effects of fiscal consolidation over the three years of 2011, 2012 and 2013 range from 8.1% of GDP¹⁸ in Germany and 9.1% in France, to 18% in Greece. Generally speaking, these studies should be treated with caution. It is, technically speaking, difficult to distinguish the specific effects of monetary policy from those resulting directly from budgetary and fiscal policies.

EXAMPLES OF QE IN THE REST OF THE WORLD: THE FED, BOE AND BOJ

In contrast to the ECB, the three other major central banks (the Fed, the Bank of England and the Bank of Japan) were quite quick to implement unconventional QE policies with outright purchases of securities. So, in January 2015, the portion of the balance sheet made up of assets acquired through outright open-market operations was 99.5% for

the Fed, 89.9% for the BoJ and 92.4% for the BoE, compared to only 12.1% for the ECB.

Since the collapse of Lehman Brothers, the Fed has conducted several successive open-market operations. The first Large-Scale Asset Purchase programme (LSAP or simply QE1) was conducted between November 2008 and March 2009: \$200 billion of government agency debt and \$1.25 trillion of *Mortgage Backed Securities*¹⁹ (MBS). As a result of these purchases, the Fed's balance sheet nearly doubled. In the strict sense, this is still not a pure QE policy, given that the composition of the Fed's balance sheet has drastically changed (with MBS having become the majority). It is therefore more of a mix of QE and credit easing. Subsequently, the Fed initiated two other LSAPs in 2010 (QE2) and 2012 (QE3). The most significant measure of QE2 was the \$600 billion purchase of US Treasury bonds. During QE3, the Federal

Summary: Unconventional ECB Monetary Policies since 2008

Year	Programme	Sterilisation	Operation
2008	Fixed-Rate Full Allotment (FRFA)	Unsterilised	Fixed-rate refinancing operations. All bank liquidity needs provided for.
2008	Long Term Refinancing Operation (LTRO)	Unsterilised	Like FRFA but with long-term operations. Extension of maturities between 2008 and 2012: maturities of 6 months, 1 and 3 years.
2009	Covered Bonds Purchase Programme 1 (CBPP1)	Sterilised	Purchase of covered bonds principally issued by credit institutions.
2010	Securities Market Programme (SMP)	Sterilised	Temporary and limited purchase of sovereign bonds on the secondary market.
2011	Covered Bonds Purchase Programme 2 (CBPP2)	Sterilised	See CBPP1.
2012	Outright Monetary Transaction (OMT)	Sterilised	Purchase of sovereign bonds on the secondary market (unlimited in terms of time and amounts). Countries whose debt is purchased are subject to the economic recommendations of the European Stability Mechanism.
2013	Forward Guidance	-	Anchoring market expectations about the evolution of monetary policy.
2014	Covered Bonds Purchase Programme 3 (CBPP3)	Sterilised	See CBPP1.
2014	Targeted Long Term Refinancing Operations (TLTRO)	Unsterilised	System of long-term loans made available to banks. Transitional measure (repos) with FRFA or 3-year LTRO limits.
2015	Expanded Asset Purchase Programme (EAPP)	Unsterilised	Combination of the existing Asset Backed Securities Purchase Programme (ABPP or CBPP3) and the Public Sector Purchase programme (PSPP).

18 - This refers to GDP for the year 2013.

19 - A mortgage-backed security (MBS) is a type of asset-backed security that is secured by a mortgage or collection of mortgages.

Open Market Committee (FOMC) announced the monthly purchase of \$40 billion of MBS and \$45 billion of US public long-term bonds.²⁰

The BoE's QE was announced in March 2009: up to £75 billion was pledged for purchasing securities, predominantly medium or long-term gilts. The QE amounts have since been increased (ceilings of £200 billion in late 2009, £275 billion in 2011, and then £375 billion in 2012, with public debt securities always accounting for the large majority).

Lastly, in an economic context very different from that of Europe or of the United States, the BoJ (pioneer of QE in the 1990s) has, since 2008, multiplied the number of outright purchase operations of Japanese government bonds (JGB), corporate bonds and asset-backed commercial Paper (ABCP).

The effects of these unconventional monetary policies can be measured in terms these respective economies' GDPs. As at the end of 2014, the ECB balance sheet amounted to 17.6% of the euro area's GDP, far behind that of the Fed (24.5% of US GDP), the BoE (22.6% of UK GDP) and especially the BoJ (59.1% of Japan's GDP). It should be noted that the ECB has, historically, had a significantly larger balance sheet than its American and British counterparts (for example, just before the outbreak of the subprime crisis in 2007, the ECB balance sheet accounted for 9.9% of GDP, compared to 5.8% for the Fed and 5.4% for the BoE).

The literature as a whole finds that QE policies had significant and substantial effects on interest rates and on economic activity. According to a recent

study,²¹ the effect of the Fed's \$1 trillion policy of outright purchases of long-term securities²² ranges between -80 bps and -20 bps on 10-year sovereign yields, with an average of -42 bps. Given the magnitude of the LSAP conducted in the US, the overall effect on long-term sovereign rates is close to -90 bps. The effects are thus greater than those witnessed in Europe. Similarly, in the UK, the effect of QE policies oscillates between 40 bps and 100 bps down on long-term gilts.

Moreover, the macroeconomic impact of the \$1 trillion QE policy in the US fluctuates, according to surveys, around 1 percentage point of GDP²³ and almost 0.75 percentage points of inflation. Additionally, an approximate 1.5 percentage point drop in unemployment is attributable to QE.²⁴ In the UK, the £200 billion QE programme has delivered a maximum impact of roughly 2 percentage points on GDP and around 1.5 points for inflation. When it comes to Japan, the results are much more modest: some of the QE policies had no effect on activity, nor on inflation. However, it should be noted that Japan has been experiencing a return to positive inflation for nearly 3 years, possibly resulting from the extensions of the Asset Purchase Programmes in 2012.

WHAT WILL BE THE IMPACT OF THE ECB'S QE PROGRAMME?

A significant impact on short-term, but not on long-term rates

In the short term, the effects of the QE announcement on 22 January 2015 were significant. Our estimates confirm those obtained by the ECB. Throughout the quarter of November 2014-February 2015, 10-year sovereign yields

20 - This facility had already been implemented 6 months earlier (as part of the Maturity Extension Program), but at that time purchases of long-term securities were sterilised by short-term US bonds sales, which is no longer the case under QE3.

21 - Williams (2014) carried out a review of the empirical literature.

22 - This amount was chosen because it is comparable to the size of QE in the euro area.

23 - The peak value (the maximum value of impact) is retained.

24 - These results do not include QE3 conducted by the Fed in 2012.

dropped by 16 bps. Those of covered bonds dropped by 27 bps and those of corporate bond yields by 25 bps.

For the entire euro area, in a short time frame of 5 days around the date of the QE announcement by the ECB, the evolution of the spot sovereign yield curve is shown in Figure 3.

With maturities of 10 years, yields fell by 15 bps between 22 and 23 January 2015. This decline benefited a number of countries with low levels of default risk. For example, the rate on 10-year French OAT government bonds fell by more than 16 bps between 21 and 23 January 2015 (from

0.699% to 0.545%). There was also a very marked effect for the 10-year German *Bund* (of the order of 21 bps). The effect was much lower in Italy and Spain (less than 10 bps in each case). Lastly, despite a significant drop in the 10-year Greek rates being observed the day after the QE announcement (decline of 55 bps), it was completely annihilated the following working day (+70 bps between 23 and 26 January).

By expanding our time horizon, we see the low persistence of the effects of QE (see Table 2). After a further decline in long-term interest rates during the month of March 2015 (when the first purchase operation was conducted, on 9 March to be

Figure 3: Sovereign yield curve (entire euro area) between 20 and 26 January 2015. Maturity: 3 months to 15 years. Source: ECB.

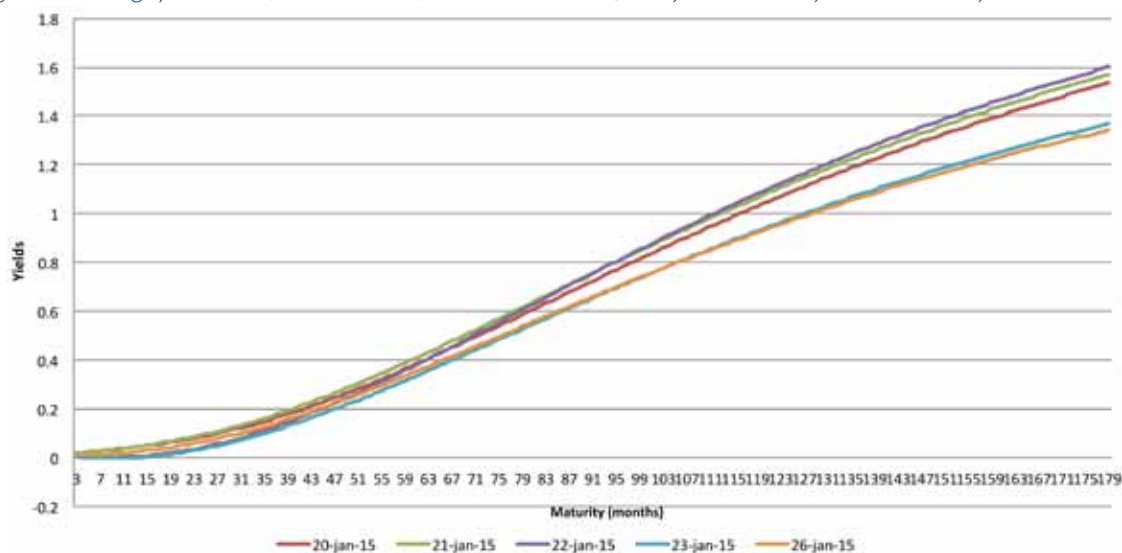


Table 2: Sovereign yield curve (entire euro area) between January 2015 and April 2016. Maturity: 3 months to 15 years. Source: ECB

Date / Maturity	3 months	6 months	1 year	5 years	10 years	15 years
January 2015	0.1516%	0.1996%	0.1870%	0.0299%	0.4158%	0.7479%
April 2015	-0.2524%	-0.2870%	-0.2486%	-0.1051%	0.2342%	0.4258%
July 2015	-0.2582%	-0.2537%	-0.2565%	0.2048%	0.9865%	1.3842%
October 2015	-0.3311%	-0.3135%	-0.2847%	0.0019%	0.6374%	1.0020%
January 2016	-0.4678%	-0.4492%	-0.4105%	-0.0287%	-0.6867%	1.0992%
April 2016	-0.4948%	-0.4878%	-0.4836%	-0.3115%	0.2216%	0.5570%

precise²⁵), sovereign bond yields shot back up from the month of May 2015 due to the combined effect of oil price tensions and political instability surrounding the future of Greece.²⁶ This spike in sovereign yields also affected corporate bond yields (essentially investment grade yields). This increase was specific to long-term rates: short-term sovereign rates (i.e. 3 months) continued to fall during the summer of 2015. Although long-term rates remained relatively high throughout the second half of 2015, they have begun to drop significantly since January 2016. This drop may be due to different ECB announcements in January and March 2016 (extension of QE, higher monthly amounts of securities being purchased under QE, lowering of the key interest rate from 0.05% to 0%). Since early 2016, short-term rates have continued to decline. Overall, QE seems to have led to a sustained reduction in short-term rates, but it has not prevented strong fluctuations on long-term interest rates, on which its effects appear difficult to assess.

The effect on the interbank markets is a little different (see Figure 2). For example, the 3-month Euribor continued a steady decline in 2015, which has already been underway for several years. The effect of the QE announcement is shown in Figure 2. The first liquidity injection on 9 March further reduced interbank rates, but unlike long-term rates, this drop is long-lasting. Again, the drop in the rates in April 2015 following the second operation of outright securities purchases by the ECB was not followed by a corrective movement. At the beginning of July 2015, the 3-month Euribor was at -0.018%, its lowest historical level. Since then, its decline has continued and the 1-year Euribor is now also negative (-0.021% in June 2016).

So at this point, it seems that QE did not bring about sustained relaxation of the long-maturity bond markets. This contradicts some of the usual theoretical predictions about the effects of quantitative easing: the signalling channels and the portfolio compositions do not seem to work. Instead, the classic channel of bank liquidity reserves (or the monetarist channel) seems to have paved the way for a new relaxation of interbank markets.

Inflation expectations remain sluggish

The depth of observed inflation data provided by Eurostat does not allow us to identify a trend since the QE announcement. In fact, while the evolution of the annual inflation rate²⁷ in the euro area became positive in the months that followed the QE announcement (-0.6% in January 2015, -0.3% in February 2015, -0.1% in March 2015, 0% in April 2015 and 0.3% in May²⁸ 2015), core inflation²⁹ remained relatively stable at around 0.7%. At most, we note a sudden spike in May 2015 (of 1% or 30 bps more than in April) which is too sporadic to be considered reliable. Since then, core inflation has fallen and returned to the levels seen last year (0.8% in May 2016).

Following the QE announcement, the inflation expectations of the markets (deduced from forward inflation swaps with different maturities) were pushed slightly upwards (by about 30 bps). Expectations at a 10-year horizon (or more precisely, at a 1-year horizon in 9 years' time³⁰) rose slightly above 2% before stabilising. The effect was not as marked at other forecasted horizons.

25 - With an impact (still temporary) on long-term interest rates. German and French 10-year rates fell by about 20 bps during the week of 9 March 2015.

26 - Some financial markets observers have also suggested that the market decline (higher long-term rates, but also the fall in stock prices and slight tension on credit spreads) could be due to expectations of the ECB bringing QE to a premature end (Artus, 2015).

27 - Annual inflation is the change in prices (the Harmonised Index of Consumer Prices) between the reference month and the same month of the previous year.

28 - The rate of inflation for the month of May is an estimate.

29 - Core inflation is the annual rate of inflation excluding the prices of energy, food, alcohol and tobacco. This indicator is regarded as more reliable, because it is less volatile than inflation itself.

30 - 1-year Inflation-linked swap rate 9 years ahead.

According to the *Survey of Professional Forecasters*³¹ (SPF) (see Table 3), the 2016 inflation forecasts that were made in 2015 might have gone up since the QE announcement (from 1.1% in the 1st quarter of 2015, they went to 1.2% in the 2nd quarter, and then to 1.3% in the 3rd quarter). However, these forecasts then fell (from 1% in the 4th quarter of 2015 to just 0.3% in the 2nd quarter of 2016). Similarly, the 2017 forecasts made in 2016 are 1.3% lower than those made in 2015.

Overall, variations in expected inflation within the euro area are minimal, in the short and medium term. QE does not seem to have pushed inflation expectations upwards, as the ECB had intended. There are several possible explanations: firstly, some of the above-mentioned theoretical mechanisms take a long time to implement and thus shift inflation upwards. Moreover, as showed previously, unconventional mechanisms (i.e. those specific to QE) do not appear to have been in operation since the beginning of 2015: long-term rates have not undergone a sustained reduction (or have only done so in the last few months). The means of direct financing for businesses and refinancing in the financial sector were also made more difficult during the course of 2015.

It is therefore the “conventional” mechanisms that might bring inflation back to its 2% target level: an increase in private demand via the classic credit channel, or an increase in private demand via a wealth effect.³²

The classic credit³³ channel, the common transmission mechanism for monetary policy, assumes an easing of credit conditions through easier access to liquidity for banks.³⁴ We have witnessed several sharp declines of the Euribor since the QE announcement and the different ECB outright purchase programmes. As the Euribor serves as a basis for many credit contracts in Europe, it is the primary factor when it comes to easing the supply of credit to the private sector. The ECB's *Bank Lending Survey* states, namely that since the first quarter of 2015, there has been an easing of the terms of bank loans in the euro area. This effect is especially marked for corporate loans and consumer credit (much less so for mortgage lending). Similarly, growth rates of indicators of the money supply have clearly risen since mid-2014, that is, since the introduction of new measures aiming to boost the size of the ECB balance sheet (see Figure 4). M1 in particular is a strict measure of money supply made up of coins and notes in

Table 3: Inflation forecasts (*Survey of Professional Forecasters*, Source: ECB). The current year corresponds to the forecast year. Note: The inflation forecast made in the 1st quarter of 2014 for the entire year of 2014 was 1.1%.

Forecast Date	Forecast for the current year (year N)	Forecast for the year N + 1	Forecast for the year N + 2
2014 Q1	1.1%	1.4%	1.7%
2014 Q2	0.9%	1.3%	1.5%
2014 Q3	0.7%	1.2%	1.5%
2014 Q4	0.5%	1.0%	1.4%
2015 Q1	0.3%	1.1%	1.5%
2015 Q2	0.1%	1.2%	1.6%
2015 Q3	0.2%	1.3%	1.6%
2015 Q4	0.1%	1.0%	1.5%
2016 Q1	0.7%	1.4%	1.6%
2016 Q2	0.3%	1.3%	1.6%

31 - Those of the second quarter of 2015.

32 - We can mention imported inflation via an exchange rate effect, but this mechanism is difficult to test.

33 - This also refers to the narrow credit channel, as opposed to the “wide” channel which, through the wealth effect, allows agents who support the demand for credit to transit through.

34 - This channel assumes an imperfect substitutability of liquidity and other means of refinancing for banks.

circulation, as well as overnight deposits. Its rate of growth, which is strongly correlated to that of the ECB balance sheet, is now higher than 10%, compared with only 5% a year earlier. The progression of M3, which also includes short-term deposits and some liquid financial instruments, is nearby. That said, it should be noted that there has been a slowdown in the pace of growth since mid-2015. All of these factors, combined with a rise in demand for businesses and consumer credit (see the *Bank Lending Survey*), have led to an increase in the annual growth rate of loans granted to residents (companies and households) of the euro area. The annualised growth of private credit has only been positive since mid-2014 for loans to households and mid-2015 for corporate loans. It settled at over 1% in April 2016, while it had been heavily negative in 2013.

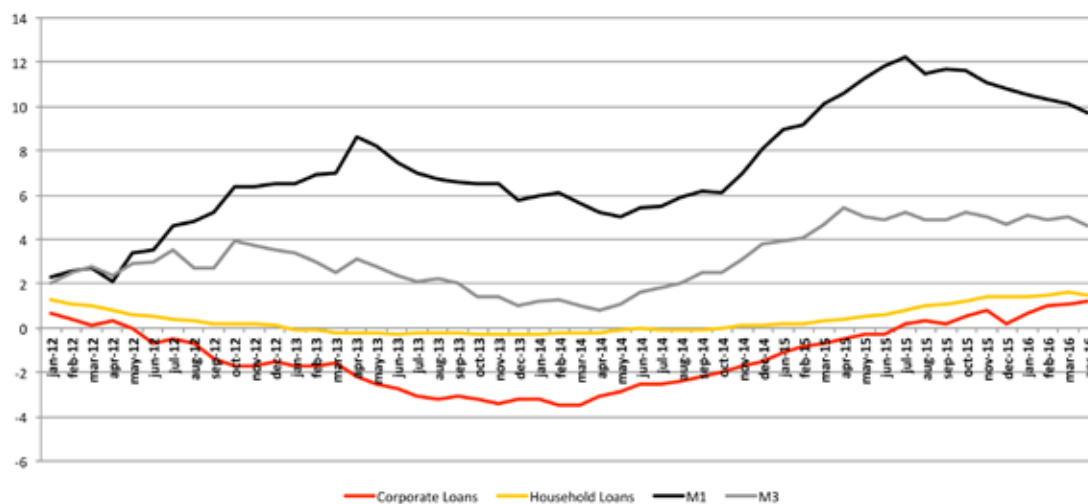
This increase remains modest in comparison to the growth rates seen before 2012. It would therefore be premature to claim a return of private demand via the credit channel.

An increase in share prices, following QE, could also lead to a rise in demand and a rise in inflation, via a “wealth effect”. Theoretically, the QE policy might have three effects the equity markets.

Firstly, a drop in interest rates caused by QE leads to a decline in the yields of bond instruments, prompting investors to turn to riskier investments. This reallocation of portfolios can push the equity markets upwards. Secondly, the low interest rate environment also influences the decisions of companies in terms of debt. This can lead to companies investing more and financing this investment through the acquisition of low interest debt, which can consequently lead to an increase in share prices. Thirdly, the implementation of QE may cause a drop in the euro. This depreciation can be favourable to European companies, for whom a large part of their turnover stems from abroad (namely in dollars). This increase in overseas sales and consequently in business profits can have an upward effect on share prices.

Historically, the announcement of a QE policy in the United States and in Japan boosted the

Figure 4: The annual growth rate of M1 and M3 monetary aggregates, households and corporate loans (excluding the financial sector). (Source: ECB, with a seasonal adjustment).



stock markets. In Europe, the ECB announcements have, for now, resulted in a short-term rise in the equity markets. Following the QE announcement of 22 January 2015, the European equity market rose once again and remained at levels high until August 2015. However, that very month, the Asian market crisis impacted the European market and “cancelled” the effects of QE. When QE policy changes were announced on 21 January and on 10 March 2016, the equity markets briefly rose, although no significant effect seems to have lasted in the days that followed.

the evolution of the stock market was influenced by other factors including: i) the volatility of emerging markets (including Asian and South American markets), the slowdown of the Chinese economy and the currency depreciation worried investors; (ii) the evolution of oil prices which threatens the companies in the sector and exporting countries; (iii) uncertainty surrounding whether the Fed will increase rates (strong likelihood of an increase in rates in July 2016).

Figures 5 and 6 show the evolution of the CAC 40 and EUROSTOXX indices between October 2014 and June 2016. The red dots indicate the dates of the ECB's QE announcements.

The first effects of the QE policy on the equity markets were thus short-lived. The effects in the long term are more difficult to quantify because

Figure 5: Evolution of the EUROSTOXX 50 index. Source : Yahoo Finance.

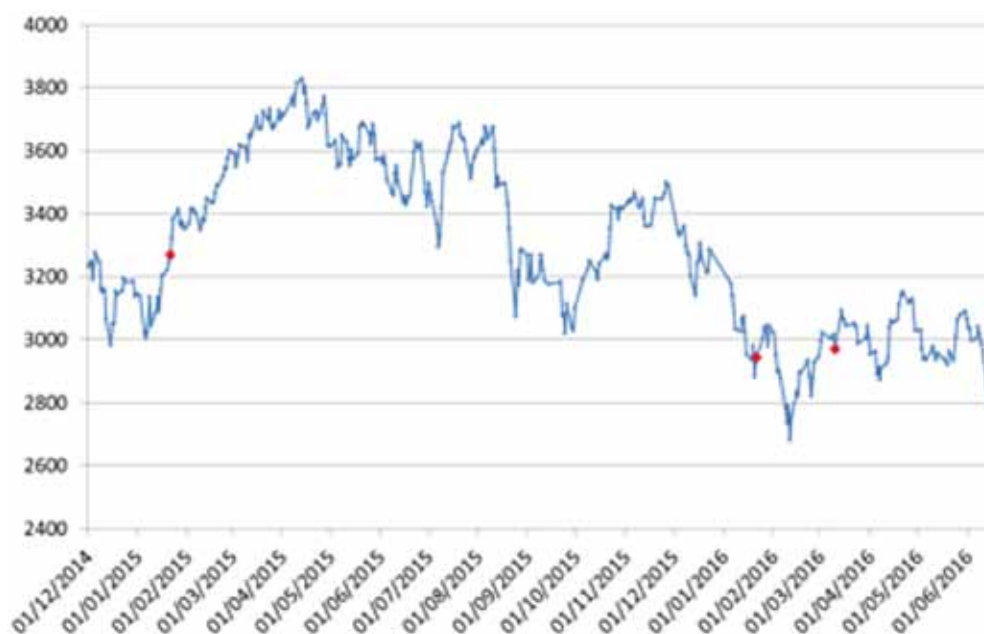



Figure 6: Evolution of the CAC 40. Source : Yahoo Finance.





**2. WHAT IS THE IMPACT
OF THE QUANTITATIVE EASING
POLICY ON THE INSURANCE
INDUSTRY?**



2. WHAT IS THE IMPACT OF THE QUANTITATIVE EASING POLICY ON THE INSURANCE INDUSTRY?

Earlier in the Introduction of this document, we saw that within the European Central Bank's quantitative easing policy, the rate for refinancing was lowered to 0%, thus allowing banks to borrow freely from the ECB. At the same time, the ECB has downgraded both its inflation and growth forecasts for 2016, 2017 and 2018 in the euro area: inflation down to 0.1%, 1.3% and 1.6% respectively (far from the sustainable goal of slightly less than 2%), and GDP to 1.4%, 1.7% and 1.8% respectively. Furthermore, according to Mario Draghi, these rates "will remain low, very low, for an extended period of time and well beyond the time horizon of our purchases" (Draghi, 2016).

The aim of this section is to analyse how this low interest rate situation presents a real challenge for the insurance sector and to see what solutions are available. It should be recalled that while the refinancing rate was still at 0.75%, Denis Kessler, CEO of the world's 5th largest reinsurer – Scor, stated that historically low interest rates "were ruining the insurance and reinsurance sector little by little" (Kessler, 2014).

As a matter of fact, this environment further aggravates the problem of declining portfolio returns, already complicated by the Solvency II prudential regulations that favour less risky assets, and by the evolution of European accounting rules that stiffen management. We now know that the level of outstanding investments in 2014 was of the order of €10 trillion for the European insurance sector (FFSA, 2015).

II.1. WHAT SOLUTIONS ARE AVAILABLE WHEN FACED WITH THE LIFE INSURANCE CONUNDRUM IN A LOW INTEREST RATE ENVIRONMENT?

Before proposing solutions to manage the dilemma of life insurance in an extremely low interest rate environment, we should revisit the fundamentals of this business activity and particularly the challenges it faces.

First of all, it should be recalled that life insurance is based on a contract that stipulates the payment of a single premium or regular premiums by the policyholder, where the insurance company agrees to pay out a predefined sum (in the event of an occurrence in the life of the insured person, including death) or annuities (in the case of a pension). In Europe, any insurance company offer summarily consists of three contracts: euro contracts, unit-linked contracts and hybrid contracts.

For **euro contracts**, the investment risk is borne by the insurance companies. In practice, the policyholder pays a regular premium or a lump sum and the insurer makes its own asset allocation choices. This allocation must, on the one hand, generate a level of annual revenue that is sufficiently attractive compared to the returns offered by other insurance companies, but also compared to other financial investments. This revenue is widely communicated on an annual basis and, as such, constitutes one of the

competitive advantages for the collection of premiums the following year. On the other hand, this asset allocation must also be able to meet the guarantees offered by the euro contracts (depending on the European country, this may be a capital guarantee, or even a guaranteed annual return, as is often the case in Germany, Switzerland and Belgium, or it could be collective insurance as is the case in France, for example), as well as any options relating to settlement, collateral, total or partial redemption, and contract renewal.

The insurance pledges made to policyholders are found on the liability side of the company balance sheet, namely under *technical insurance reserves*, which appear beside shareholder capital. These act as a buffer in the event the technical insurance reserves are insufficient. Specifically, this type of provision corresponds to the present value of the insurer's commitments net of those of policyholders, which explains the fundamental role played here by the interest rate given that it serves as a basis for the discount rate. Readers should be reminded that poor estimation of the sensitivity of technical insurance reserves to interest rate changes has been the main cause of bankruptcy for several life insurance companies (such as *Mannheimer Lebensversicherung* in Germany in 2003 or *Nissan Mutual Life* in Japan in 1997).

Faced with these challenges relating to remuneration, guarantees and options where risks are borne by insurance companies, the latter chose to build portfolios mostly composed of well-rated sovereign and corporate bonds (with at least an A-rating from agencies). While this investment policy allows them to annually meet the contractual guarantees offered by the contracts, it nevertheless raises different problems in the current context of low interest rates: competitiveness compared

to other investments, the management of the sensitivity gap between assets and liabilities in relation to interest rate changes, and reinvestment risk.

More specifically, interest rate risk stems from different distortions of the yield curve: translation, rotation and change in convexity. It is these changes in the yield curve that have an impact on the balance sheet, the financial margin (the difference between the insurer's asset returns and the rate of return paid to policyholders) and turnover of insurance companies.

The drop in interest rates has a direct impact on the balance sheet, and on the value of insurance assets and liabilities. It results in a higher market value of the bond assets held, but also in an increase in the value of the liability commitments held by the insurer. The overall effect depends on the duration mismatch between the assets and liabilities. The larger and more positive this mismatch is, the more substantial the downward interest rate impact will be, and this will result in a reduction of the company's economic value (as the value of liabilities will be increasing faster than that of assets). Furthermore, it must be noted that contract characteristics (guarantees, options, duration) can amplify or reduce this interest rate sensitivity and exposure to interest rate risk. So, only equity-backed assets can offer a real assessment of the company's economic value.

Regarding the financial margin, the decline in interest rates puts pressure on bond instrument yields, which are the largest constituents of insurance company investment portfolios. Therefore, there is a high risk of reinvestment for companies who see their assets that offer attractive returns (acquired prior to the decline

in rates) reaching maturity. If, today, they reinvest the fruits of maturing bonds in zero-coupon or similar bonds, the financial margin is put under pressure, and can even become negative. Given the significant contribution of the financial margin to profitability, it should be noted that the financial health of an insurance company can be severely affected.

Additionally, an insurance company runs a major risk if rates go back up: depreciation of bond values in the portfolio and low relative return compared to newly-issued bonds, generating competitive distortions, particularly in the case of new entrants. Furthermore, if the company chooses to reduce the duration of its bonds in order to hedge against rising interest rates, it then amplifies the risk of mismatches between asset and liability maturities (duration gap).

In addition to this remuneration paid to the policyholders (and depending on the European country), some euro insurance policies offer high guaranteed rates (which can go beyond 5% because they were offered well before the rate decline). Within the context of a massive amount of purchased bonds nearing maturity, the low interest rate environment could result in an inability to pay out the guaranteed rates. To meet their commitments, insurers are forced to draw upon their reserves (provisions for profit-sharing, policyholder surplus reserves, etc.). If the low interest rate period persists, these guaranteed rates are likely to undermine the financial health of the companies, and even put them at risk.

Lastly, the low interest rate environment is also under turnover pressure, insofar as contracts are no longer able to offer attractive returns for policyholders. A few years ago, the sector saw

a massive net outflow of funds in Europe, with policyholders seeking other, more profitable or more liquid investments for a similar level of risk.

In such an environment, the International Monetary Fund (IMF) has publicly and repeatedly asked questions about the vulnerability of life insurers, worrying about a possible Japanese scenario in Europe (a domino effect of bankruptcies in the 1990s): "*the lower the level of interest rates, the more vulnerable insurers become to further interest rate changes*" (IMF, 2016). These concerns are shared by all European prudential regulators, so much so that, for example, in October 2014 the Bank of France and the French Prudential Supervision and Resolution Authority (*Autorité de contrôle prudentiel et de résolution - ACPR*) called on life insurers to lower their compensation levels for euro funds so as to reduce the spread with sovereign bond yields. Thanks to the low inflation of recent years, the effective yield remains high, even if we question whether the drop in compensation for euro contracts (for example, in France it went from 5.3% in 2000 to 2.3% in 2015) was sufficient with regard to the sovereign bond spread, the main investment vehicle of life insurers. In what follows, we will revisit the possible solutions for dealing with these problems that are linked to the current environment of historically low rates.

Unit-linked contracts constitute the second family of life insurance products. Unlike euro contracts, for this type of contract, the insurer does not have to guarantee the euro value savings, but only the number of units of account. So, it is the policyholder who largely bears the market risk. Therefore, it is common for the insurance company and the policyholder to jointly agree upon an asset allocation that is more or less risky, according to the policyholder's objectives, knowing that the

volatility of the selected allocation is supported by the latter party. For instance, the average return of unit-linked contracts in France increased from -22.3% after the Lehman Brothers collapse in 2008 to +14.4% a year later.

Finally, the third family of life insurance products is **hybrid contracts**. It is a mix of euro contracts and unit-linked contracts, the aim of which is to produce the best security-performance combination. Naturally, the remuneration of these contracts depends on the relative weight of these two components, just like the risk borne by the insurer.

In the light of this analysis on the risk exposure of insurers in a low interest rate environment, we understand that the issue centres on the asset-liability management (ALM) of contracts with a euro component. It should be recalled ALM involves dynamically structuring a liability-driven balance sheet. The asset allocation should, on one hand, provide satisfactory annual performance (a competitive position compared to the other players in the sector) and, on the other hand, be able to meet the insurer's commitments. A level of liquidity is therefore required at all times in order to be able to settle any eventual annual guarantees, arrivals at maturity, part or early redemption of contracts including, if appropriate, dealing with a massive wave of buybacks, under threat of the company's bankruptcy. It is therefore critical to identify liability constraints: technical rates, minimum guaranteed rates and cash flow calendars.

Solvency II has imposed an economic approach that introduces additional volatility to insurers' balance sheets: liabilities are defined by discounting future cash flows on a risk-free rate curve determined on

the basis of rate swaps adjusted for credit risk as defined by the European prudential regulator and subject to market volatility. Assets, meanwhile, are priced at market value. So, when rates fall, given that spread volatility can significantly increase, the value of the assets may rise less rapidly than that of liabilities discounted at the risk-free rate.

To meet these varied objectives (in the short term, being able to quickly liquefy a portion of one's assets in the event of buybacks, to offer a competitive annual return or respond to a guarantee; in the long-term, to manage assets with respect to liabilities with maturities over 30 years, etc.), two techniques are generally used: immunisation and cash-flow matching. The first involves building a portfolio of assets, the duration of which is equal to that of the liabilities. The second is based on an asset search that allows each liability cash outflow to be replicated (matching cash inflows and outflows). Long-term credit instruments are penalised by Solvency II, and additionally ALM generally associates cash flow matching with hedging techniques such as the use of interest rate swaps. However, given the uncertainty of long-term liability flows and of an asymmetric impact of an interest rate change on assets and liabilities, this can sometimes turn out to be a risky exercise and it can easily produce duration gaps.

In an environment of falling interest rates, discounting leads to an increase in the insurer's level of commitments. On the asset side, this produces a real conundrum around the reinvestment of coupons of nearly-maturing bonds (and this holds all the more true the larger the liability duration gap is). By construction, initially expected cash flows in relation to liability timelines are reduced, which at the same time, puts pressure

on the financial margin (the difference between the insurer's asset returns and the rate of return paid to policyholders). This problem is all the more marked for guaranteed rate contracts and annuity contracts (arrears re-valued annually and sometimes even guaranteed for the policyholder, and then for beneficiaries in the case of death).

In an extreme situation, the policyholders may find that insurance companies are no longer able to make good on these guarantees without jeopardising their financial health, and they then proceed to buying back their contract. To deal with such a fund outflow, insurers are forced to liquefy a large portion of their assets, sometimes at a loss, causing downward pressure on asset prices (so-called "fire sales"). So, a massive buyback can trigger not only the bankruptcy of several companies, but it is actually a systemic risk.

In the face of this constant pressure produced by an unprecedented level of low rates, insurance companies can make use of the following strategies:

Change their commercial offering for existing contracts, on the one hand, and for collection of new premiums, on the other hand.

Firstly, with regard to already existing contracts, the most delicate strategy is a renegotiation of the existing guarantees. Negotiations are particularly arduous because it involves obtaining the consent of the policyholder to a reduction of the guarantees and to transfer their savings into other products that have no guarantees or into structured products that are more risky. However, efforts are in line with the results given that the aim is to stop or to slow down a massive outflow: the destruction of value resulting from a

negative financial margin in this low interest rate environment.

The second strategy is to shift existing savings that are on euro contracts, which provide low but positive returns (estimated at roughly 2% for 2016) and low volatility, to a unit-linked insurance component. While such a transfer may lead to better expected returns, the policyholder may however be subjected to some volatility depending on percentage of shares and corporate bonds chosen, and may thus be exposed to a potential negative yield and a loss of capital. The advantage for the insurer is of course being able to transfer all or part of those risks to the policyholder, in proportion to the share of units of account. In order to avoid a huge misselling scandal as experienced recently in the UK, we note that sales networks must be extremely well-formed and must offer advice and transparency about the risks involved, in order to avoid any repercussions for forced sale or poor advice.

Regarding the collection of new premiums, we note the emergence of new products that aim to reduce exposure to interest rate risk, namely by adapting the guarantees (level, eligibility requirements, duration, etc.), or even removing them. Many insurance companies did not hesitate to only or exclusively sell unit-linked contracts (sometimes structured to offer the policyholder some guarantees). As previously mentioned, if the profitability of these products is better for the insurer (transfer of risk to the policyholder), particularly with respect to Solvency II (if they use up less own funds than euro contracts), then the reputational and legal risks are considerably strengthened.

EVOLUTION OF GUARANTEED INTEREST RATES IN EUROPEAN LIFE INSURANCE CONTRACTS

According to Standard & Poor's, the European countries with the highest guaranteed interest rates for life insurance policies over many years are Germany, Austria, Switzerland, the Benelux and Scandinavian countries. These countries are consequently the most exposed to low interest rates.

In its Financial Stability Report of June 2016, EIOPA compares the levels of guaranteed interest rates of European insurers to a euro area 10-year government benchmark bond yield. It notes that over 7 years, there was a continuous decline in the median guaranteed interest rate of European life insurers (from 3% in 2009 to a little less than 2% in 2015). The decline in the median guaranteed rate is particularly accentuated in 2014, when 10-year government bond yields fell below the median guaranteed rate.

However, depending on the country, there is substantial inconsistency when it comes to European companies managing high guaranteed rates in life insurance contracts. Below, we provide

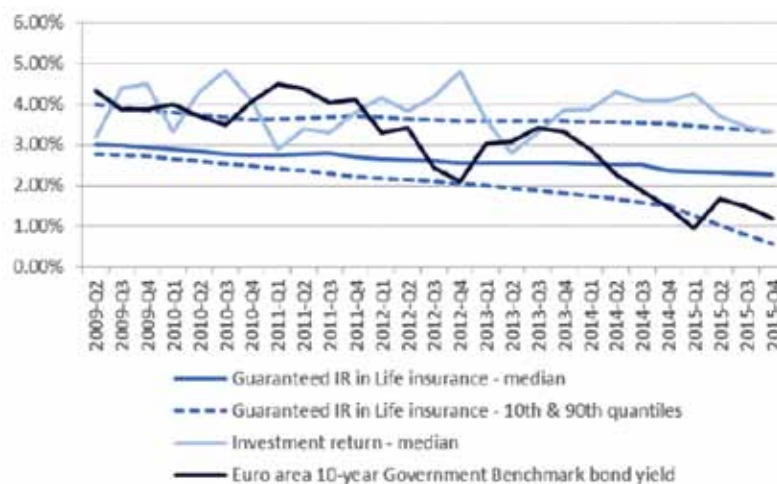
a brief analysis of the countries most sensitive to low interest rates.

Germany: the most exposed country in Europe

In our view, German insurers are among the most impacted by the decline in interest rates given the fact that, on one hand, they sold the most high guaranteed rate contracts with a long duration and, on the other hand, they have the highest asset-liability mismatch in Europe.

According to Fitch Ratings (August 2016), the asset-liability mismatch of the German market is supposedly 6 years. Furthermore, according to Moody's, the guaranteed rates of German contracts were around 4% in the late 1990s, and with a maturity of 30 years. The management of these outstanding amounts is a real headache for insurance companies, because the downward revision of the maximum guaranteed rate in Germany (1.25% today), set by the Ministry of Finance, only applies to new insurance contracts. According to Moody's, in October 2015, the

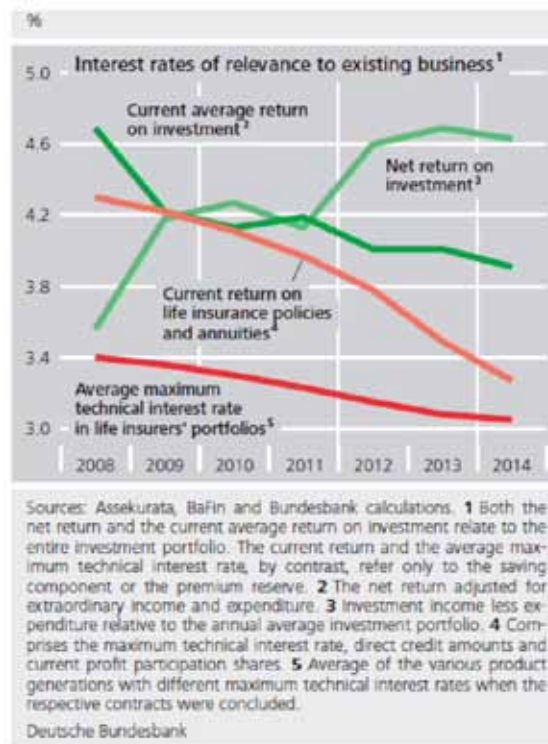
Guaranteed interest rate in life insurance vs. investment return, Euro area 10-year government bond (in per cent) bond yield



Source : EIOPA, 2016

guaranteed rates of historical contracts in the German market were 3% on average, while the yield on new German bonds is now negative. In the following graph, we see that from 2012, guaranteed rates are higher than German bond yields (Umlaufrendite).

In its 2015 Financial Stability Review of the German market, the BundesBank corroborates the decline in returns on life insurance contracts (see graph to the right).



Source: BundesBank – Financial Stability Review (2015)

Guaranteed interest rates in life insurance vs. German bond yields



German Life Insurer guarantee rate and average blended yield (Umlaufrendite).
Source: Bloomberg, Commerzbank Research, AIM

Source : Allianz, 2016

Belgium: toward a legal battle that could bring a lot of breathing space

In Belgium, although the guaranteed rates on outstanding amounts are also very high, the new Insurance Supervision Act of 13 March 2016 could offer insurance companies a breath of fresh air. In fact, the act which among other things defines a new calculation method and procedure for setting the maximum technical rate, now set at 2%, has led to some insurers revising the terms of existing contracts. A grey area could thus have been exploited by some companies but the legal debate remains still open.

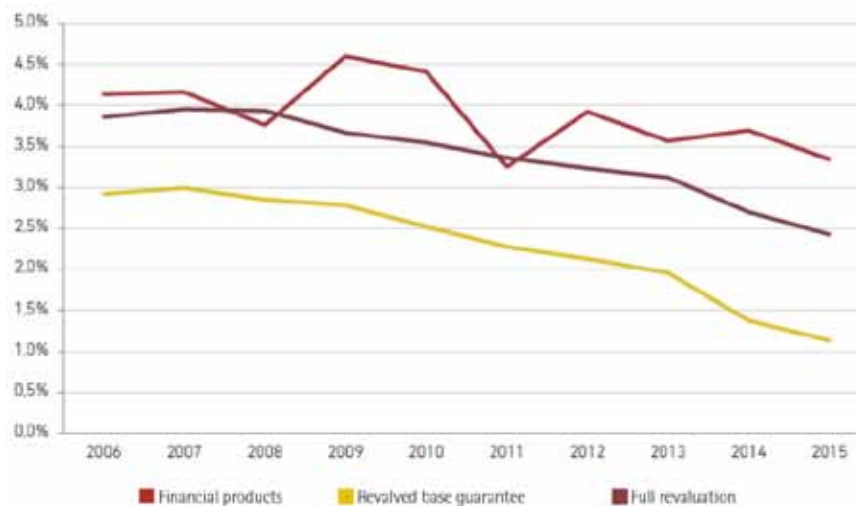
For example, since the 1990s AXA has been selling a life insurance contract called Crest20, which offers a guaranteed return of 4.75% for life. Based on this act, the insurer has reviewed the terms of the contract: for payments made between 1 January 2000 and 12 February 2016, the guaranteed interest rate changes to 3.75%; for those made between 13 February and 21 June 2016, it goes to at 2%; and for payments after 21 June 2016, it falls to 0.2%.

Other Belgian insurers have followed suit. In September 2016, the likes of AG Insurance, KBC and ING announced guaranteed rate cuts.

Luxembourg: the process of rebuilding financial margins is ongoing

Luxembourg is following the European movement by regularly readjusting initial guarantees in order to maintain a positive margin between the asset returns and the total revaluation of life insurance contracts. In 2006, the base rates were at 3% and the total revaluation rate, including participation in profits, rose to 3.9% compared to financial returns of 4.1%. This 20bps margin reduced to 10bps in 2007, and then became negative in 2008 and 2011. Since then, the base revaluation rates have been falling more quickly than financial returns. As a result, in 2015, the base valuation rate was reduced to 1%, leading to a total revaluation of 2.5%, compared to assets returns of 3.4%.

Financial return and revaluation of classic life insurance contracts



Source : Commissariat aux Assurances du Luxembourg - Rapport 2015/2016

The Netherlands: outstanding amounts on old contracts weigh heavily

Although the interest rate for new pension contracts are currently being offered at 1.5% (versus 2% in 2014), the outstanding amounts of old defined-benefit retirement contracts are still paid out between 3% or 4% (Oliver Wyman, January 2015), and are thus hanging over insurance companies like the sword of Damocles.

insurance contracts to be applied not only for new payments, but also retroactively, for former payments. These contracts which account for 65% of standard life insurance contracts (S&P, 2015) now receive a guaranteed rate of 1.75%. According to S&P (2015), individual guaranteed rate life insurance contracts with outstanding amounts that yield between 2% and 3% are not eligible.

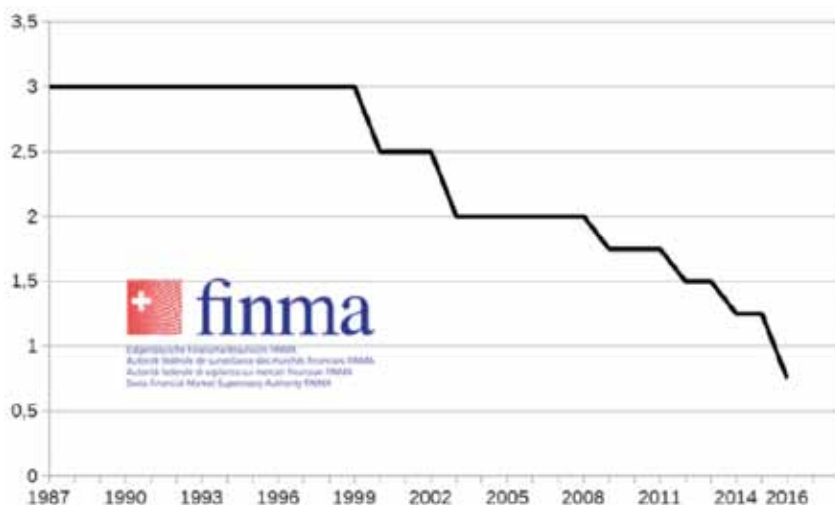
Switzerland: continued reduction in applicable guaranteed rates, including retroactive action on former payments

As with other countries Europe, in Switzerland we are seeing a continued reduction of guaranteed rates for new business. The maximum technical rate went from 3% (between 1987 and 1999) to 1.5% in 2013, to 1.25% in 2014-2015 and to 0.75% and 0.5% in 2016 respectively for contracts with periodic and one-off premiums.

The following table published by Standard & Poor's in 2015 shows, for European countries, the guaranteed rates on backbook contracts in insurer portfolios and the maximum guaranteed rates on new business.

However, unlike other European countries, the Swiss Government which sets the maximum technical interest rate each year, authorised the use of the new guaranteed rate for collective life

FINMA Technical Rate (Swiss Financial Market Supervisory Authority)



Source : FINMA

Guarantees And IICRA Assessments

Country	Guaranteed rate on backbook (%)	Maximum guaranteed rate on new business	Share of traditional life reserves	IICRA	Country risk	Industry risk	Product Risk	Profitability
Germany	3.00	1.25	70	Intermediate risk	Very low risk	Moderate risk	Negative	Negative
France	1.00	0	77	Low risk	Low risk	Intermediate risk	Neutral	Neutral
Italy	1.60-1.80	0	80	Moderate risk	Moderate risk	Intermediate risk	Neutral	Neutral
Denmark	2.50	0-1.50	71	Intermediate risk	Very low risk	Intermediate risk	Negative	Neutral
Sweden*	3.30	0	57	Intermediate risk	Very low risk	Intermediate risk	Negative	Neutral
Norway	3.00-3.50	0-2.00	85	Intermediate risk	Very low risk	Intermediate risk	Negative	Neutral
Finland	3.00-3.50	0-1.50	42	Intermediate risk	Low risk	Intermediate risk	Negative	Neutral
U.K.	N.A.	N.A.	29	Low risk	Very low risk	Intermediate risk	Neutral	Neutral
Spain	3.00-3.50	1.00	88	Intermediate risk	Very low risk	Intermediate risk	Neutral	Neutral
Austria	2.80-2.90	1.00-1.50	65	Intermediate risk	Low risk	Intermediate risk	Negative	Neutral
Netherlands	3.50	N.A.	60	Intermediate risk	Very low risk	Moderate risk	Negative	Neutral
Belgium	3.00	1.00-1.75	85	Intermediate risk	Low risk	Intermediate risk	Neutral	Negative
Switzerland	1.00-1.75	1.00-1.75	92	Low risk	Very low risk	Intermediate risk	Negative	Neutral

*Contracts can offer a guarantee of between 100% and 85% of gross premium paid. N.A.—No estimate available. Sources : Standard & Poor's estimates, IMF reports, EIOPA, European Supervisory Authorities, European Insurer Associations.

Source : Standard & Poors, 2015

Adapt the business model in order to reduce operational costs, strengthen preventive reserves and adapt hedging strategies for interest rate risk.

According to EIOPA (2014)³⁵ and Swiss Re (2012)³⁶, in order to partially offset the erosion of the financial margin, many insurers took draconian measures when it came to structuring their operational costs, and made more use of

hedging strategies (interest rate options and swaps to freeze the interest rate charged, even if this increases the counterparty risk) and/or have built up preventive reserves.

In the latter case, insurance companies are significantly scaling back profit sharing schemes (often to the regulatory minimum) and on the other hand building up provisions (provisions

35 - EIOPA. 2014. Low Interest Rate Environment Stock Taking Exercise. EIOPA-BoS-14/103

36 - Swiss Re. 2012. Facing the Interest Rate Challenge. Sigma n°4

for profit-sharing, policyholder surplus reserves), which aim to deal with the cash flow of contract guarantees entered into in a significantly higher interest rate environment.

Lengthen the duration of assets to boost returns and to reduce or cancel the asset-liability duration gap

If rates remain low over a sustained period (i.e. as is the case in Japan), this approach could prove to be very effective. By lengthening the duration of bonds, their yields improve and the asset-liability duration gap, which is costly under Solvency II, shrinks. However, the current flattening of the European yield curve makes this strategy of seeking performance through extended duration almost obsolete.

On the other hand, if the Japanese-type scenario is not sustainable, lengthening bond durations may lead to the insurer bearing an increased risk of bankruptcy, especially in the case of a sharp rise in interest rates. We recall that the duration is an increasing function of interest rates. A bond with a duration of 10 years will see its value drop by 10% for every 1% increase in the interest rate. Buying a 10-year French or German government bond today implies a having an annual yield under 0.5% for 10 years. If rates go up substantially, not only will the value of the bond decline but, above all, the insurer will see its competitive position weakened.

Worse still, in the case of a severe rates rise, new entrants could be encouraged to take over the life insurance market with new bonds at high interest rates while the existing players will suffer from the strong inertia of their existing, low-paying bond portfolio. The policyholders could thus be

tempted to arbitrate between their old and new contracts, or to move towards less risky and more lucrative investments (fixed-deposit accounts, for example). In the past, massive redemptions in some countries led to the eventual bankruptcy of many insurance companies. In the face of such a threat, it is understandable that if the Japanese scenario does not appear sustainable, it is risky for an insurer to extend the duration of its obligations. Lastly, faced with the risk of a rise in rates, insurers often engage in hedging by buying caps, interest rate options that offer them the possibility of setting an interest rate ceiling which, if surpassed, will enable them to recover the difference between the ceiling rate and the market interest rate.

Reduce the average quality of the bond portfolio to boost returns and reduce or cancel the asset-liability duration gap

Given the risks associated with lengthening the duration of portfolios, another option is to downgrade the quality of the bond portfolio, namely by reducing the share of well-rated sovereign bonds in favour of those rated BBB or lower (i.e. high yield instruments). The duration of assets is thus mechanically, and proportionately, reduced in view of available supply.

In addition, this considerably increases the risk on the bond portfolio (any corporate bankruptcy results in a total loss of the invested capital) as well as the capital adequacy requirements under Solvency II all for an improved spread that may sometimes seem very marginal in terms of risk. It is therefore imperative to closely follow the flattening of the yield curve and spreads in the euro area because the search for additional return linked to duration and credit can no

longer be justified, particularly when the marginal risk and prudential cost of Solvency II is taken into account.

Boost the duration of asset portfolios and expected returns via real estate

In the current context of low interest rates, we have seen investment grade bonds yield little profit and force insurers to seek out other asset classes. The decision to increase one's share of equity is not always topical given the volatility of this market and given the expected return, especially with regard to the cost of Solvency II prudential requirements. It should be noted that a decline in share prices within a low interest rate market produces a scissor effect: asset values fall while those of liabilities increase.

Real estate constitutes the third traditional asset class within insurer portfolios. Real estate has historically made up a large portion of insurance company portfolios, given its performance and its capacity to handle inflation. In the current low interest rate environment, two questions arise: is inflation a threat to life insurance? Are real estate returns attractive enough, particularly in light of the Solvency II capital requirements (a premium of 25 cents of shareholders' equity for each euro invested in real estate)?

As we showed in the first section on Quantitative Easing, the European Central Bank would like a significant rise in **inflation**. For the life insurance sector, the goal is to preserve the value of underwritten savings contracts, especially from the moment when the inflation rate exceeds the interest rate. In such an environment, asset-liability management is generally structured according to two components: a bond component dedicated

to risk management for liability hedging; an equity and real estate component, the value of which can mirror inflation and thus optimise asset returns. As previously mentioned, the equity asset class will not be as attractive as it once was due to its excessive cost of capital under Solvency II (depending on the market level, a premium of between 29 and 49 cents of shareholders' equity is required for each euro invested in listed stocks).

With rents having been indexed on a national inflation-based index, real estate has historically been seen as an attractive asset class for managing said inflation. In a low interest rate environment, what role can real estate play in the financial policy of insurers looking for feasible and sustainable solutions to the problems of duration, liquidity, profitability (value and returns) linked to market volatility and profitability under the Solvency II prudential capital requirements?

The evolution of the real estate market over the last two decades and its low volatility have helped insurers to regularly reap capital gains benefits and to thus maintain the rates of return paid to policyholders, notably through a major reallocation within the real estate asset class since the mid-1990s – with offices space and commercial premises being favoured over residential property (the weight of the latter has fallen by 40% in ten years).

While real estate remains a classic way for insurers to diversify their asset portfolios to allow for more flexibility in their asset-liability management, particularly in a context of low interest rates and declining yields, it should however be kept in mind that it will also not forever be the "*deus ex machina*", providing a foolproof guarantee

for insurers. The role of real estate in asset-liability management within a low interest rate environment should be evaluated taking into account the four factors of duration, liquidity, risk and profitability under the constraints of Solvency II capital requirements.

First, we should note that the accounting dimensions, management costs and Solvency II adversely affect the notion of real profitability in the property sector, to the extent that insurers do not have a common language, thus prompting comparisons around this topic:

- The depreciation of real estate assets brings about depreciation of the net book value, which is often different to the real market value on the one hand, and *ipso facto* leads to significant capital gains upon sale, which, on the other hand, is also disconnected from monetary reality. In addition, book value is, by construction, less volatile.
- Due to the requirement of professionalism when it comes to the quality of management for real estate assets, processing costs are high and consequently penalise returns. It is therefore important to conduct a clear analysis of management fees.
- It is essential that an analysis on the profitability of real estate be done in light of Solvency II regulatory capital requirements. The 25% equity capital charge for investments as defined by EIOPA in line with the UK market is very controversial, but it remains a topical issue. This cost is very often put forward as constituting an obstacle to diversification.
- Lastly, of course, it is necessary to assess whether the return, the diversification qualities and inflation support are sufficient to offset the illiquidity dimension. In the short term, according to some players, the duration of commercial and

offices leases, on the one hand, and high vacancy rates, on the other, reduce inflation protection.

It should be noted that many French insurance companies have chosen to create private limited companies for property purposes (*Société Civile Immobilière* or *SCI*), in order to diversify risk, achieve economies of scale and make use of centralised management that offers a lot of flexibility (controlling the financial results of the *SCI* through dividends paid to insurance companies or transfers that allow returns to be distributed to policyholders regardless of the property's revenue). However, although it offers geographic diversification, few want to invest real estate paper after conducting a classic return-liquidity-risk analysis. The returns appear inadequate in view of the high volatility and low liquidity.

So, due to the very different perception that insurance companies have of these issues, the debate carries on. Can real estate constitute a significant share (which today represents between 5% and 10% of total assets) of portfolio diversification and offset the bond losses caused by the low interest rate environment, despite the risks induced by its management (the market for quality real estate assets remains very narrow, particularly with respect to the collection of premiums by life insurers), its illiquidity and by Solvency II?

Boost the duration of asset portfolios and expected returns via other less traditional assets

To increase expected return, most insurers have reduced their share of government bonds in favour of diversified UCITS, with profitability

targets of the order of 3-4% and volatility of 3%. In the Solvency II universe, this asset class provides diversification, exchange rate risks are hedged and decorrelation strategies are implemented, so well that the prudential capital requirements are usually a little more relaxed (lower than 10%).

Structured products are also becoming increasingly popular as they offer guarantees of performance over a period of 6-7 years with a possibility of benefitting, if applicable, from a portion of the increase in the equity markets, and setting a floor in terms of capital losses suffered in the event of a financial market downturn.

Some insurers are also turning to other "less" traditional sector assets such as covered bonds, asset-backed securities, residential, commercial, and agricultural loans, collateralised loan obligations (CLOs),³⁷ as well as public or private loans (SMEs, mid-cap companies, local authorities), direct or indirect lending (funds lending to the real economy) alternative investments (private equity, LBO funds, infrastructure, hedge funds, etc.).

In conclusion, the low interest rate environment of Quantitative Easing has brought to life some major challenges for the asset-liability management of contracts which include a euro component: managing of the sensitivity gap between assets and liabilities which has been accentuated by Solvency II and the increased volatility of spreads; the conundrum of reinvesting bonds nearing maturity, coupons and new insurance fund inflows; financial margin pressures and competitiveness compared to other investments. These problems are all the more acute for guaranteed rate and/

or annuity contracts, and for corporations with a significant asset-liability mismatch.

The more positive and the higher the duration gap between assets and liabilities, the more the company's economic value is affected: the value of liabilities increases faster than that of assets, and all the more so since Solvency II introduced additional volatility to balance sheets, linked to the discounting of liabilities based on a risk-free yield curve calculated on the basis of rate swaps adjusted for the credit risk set by the European prudential regulator; assets, meanwhile, are priced at market value.

Faced with the pressure of unprecedented low interest rates, insurers' strategies are not expandable: they boil down to adjusting their commercial offering (desensitisation to interest rate risk), adapting their business model (reduction of operational costs, hedging), lengthening the duration of assets to reduce the mismatch (very risky with bonds if rates go up), downgrading the average quality of the bond portfolio, and increasing the duration of their assets and expected return through various financial techniques (structured, decorrelation) and/or investments (real estate, public or private loans, infrastructure, covered bonds, CLOs, etc.).

II.2. WHAT SOLUTIONS EXIST FOR NON-LIFE INSURANCE?

Compared to life insurance, non-life insurance is less sensitive to the low interest rate environment, particularly because a large part of the activity deals with short-duration liabilities, and also

37 - More commonly known as *Asset Backed Securities*, *Residential Mortgage Backed Securities*, *Commercial Mortgage Backed Securities*, *Agricultural Mortgage Backed Securities* or other special purpose vehicles such as the *Agency Pools*, which are mortgage backed (U.S.) Government Sponsored Enterprises (GSEs). Collateralised loan obligations are instruments backed by a pool of debt, often corporate debt with a low rating. CLOs are similar to mortgage backed securities, with the exception of the type of underlying loan, and they thus offer broad diversification and potential for higher returns.

because profitability can also be achieved through the technical result of insurance.

In this regard, it is interesting to note the evolution of the economic model of non-life insurance. At the end of the 1990s, the financial markets (stocks and bonds) provided very high returns (going beyond 10%). At the time, the economic model was focused on collecting non-life insurance premiums, the investment of which generated profitability. The risk insurance dimension (technical result) was then pushed to the background and combined ratios³⁸ were hitting three-digits without creating any concerns. It was a purely financial activity fuelled by a volume effect for premiums.

Then came the internet bubble stock market crash of the early 2000s, and rates went into continuous decline. The business model of non-life insurance has had to adapt. With pure financial activity no longer providing enough profitability, insurance companies turned back to their core business and focused on the goal of significantly reducing the combined ratio, to below 100%.

To deal with the low interest rate environment, two major mechanisms were available: improving the combined ratio and optimising the profitability of financial investments.

Improving the combined ratio

To reduce the combined ratio to levels below 100%, there are three operational mechanisms, by construction: increasing the level of premiums; reducing acquisition costs and general fees; and reducing the loss ratio.

Increasing contract prices in a low interest rate

environment allows insurers to offset the loss of earnings but, in practice, it is not always possible given the competitive environment and insurance cycles. As a reminder, this sector traditionally goes through *hard market* periods, characterised by high premiums, generally coupled with a limited supply, and *soft market* periods, in which the policyholder benefits from eased underwriting and cheaper conditions, but which equally reduce the solvency of companies. Added to these endogenous factors which are often guided by the contract pricing, the cycles can be amplified (volatility and severity) or discontinued (time cycle) due to exogenous factors such as a spike in claims (e.g. natural disasters) or due to macroeconomic factors (inflation, lower interest rates or stock market returns).

Today, combined ratios are under pressure as shown by the ratings agency *Fitch* who, at the beginning of the year, further downgraded its outlook on the non-life insurance sector in some European countries. In France, for the year 2016 for example, it expects 1.6% growth in property and casualty (P&C) insurance and a continuous erosion of profitability (combined ratio of 103%, compared to 102% in 2015). We note that in this country, a rise in the frequency and severity of claims, as well as some effects of the *loi Hamon* (consumer law) of 18 March 2014 relating to rates and portfolio rotation (+17% in insurance provider switches as at the end of 2015, compared to the previous year) are unlikely to clear up the outlook.

However, better management of contract pricing with respect to exogenous and endogenous (competitive) market conditions has become a key weapon against a low interest rate environment,

38 - The combined ratio is an operational indicator of activity within the non-life insurance sector. It is the sum of incurred losses (measured by the level of claims expenses compared to premiums earned – turnover) and an expense component (defined as the sum of administrative and acquisition costs attributed to premiums).

alongside more structured and traditional measures, such as the reduction of administrative costs and claims management.

Finally, it should be noted that all non-life insurance activities do not have a short duration and therefore only a section of this industry is concerned with technical provisions being up to date, and it is thus sensitive to the previously described issues on this topic relating to life insurance. For example, dependency insurance, by its very nature, has extremely long duration. The low interest rate environment has thus increased the level of commitments on the liabilities side of the balance sheet, a sum defined under Solvency II as the best estimate³⁹ and a risk margin.⁴⁰

Optimising the profitability of investments

The issues here are identical to those described in the section on life insurance: the asset-liability management challenge; finding the best alignment of asset-liability durations; diversifying assets; finding the right balance between the factors of return, risk and liquidity.

In summary, while a persistent low interest rate environment has a lesser impact on certain branches of non-life insurance, particularly because of their duration, this sector must still rethink and permanently adapt its business model by using mechanisms that typically involve seeking out a better combined ratio and optimising the profitability of investments.

39 - Readers should remember that the notion of a best estimate usually corresponds to the probability-weighted average of future cash flows, taking account of the time value of money, using the relevant risk-free interest rate term structure. This estimate must be based upon up-to-date and credible information and realistic assumptions, and thus be performed using adequate actuarial and statistical methods. Consequently, this estimate integrates uncertainty over the timing, frequency and severity of claims (including the impact of inflation), but also uncertainty around events likely to affect spending (inflation, legislation, demography, environment, etc.).

40 - The risk margin is the portion of technical provisions calculated from the cost of capital of own funds necessary to meet the solvency capital requirements for insurance obligations over their lifetime.



CONCLUSION



CONCLUSION

In conclusion, we have shown how much the ECB's Quantitative Easing policy weighs on the insurance industry. The low interest rate environment has presented a real strategic challenge for the asset-liability management of companies, particularly in view of the reduced room for manoeuvre offered by structural liability compensation mechanisms through assets. While no more proof is needed to demonstrate that life insurance remains the most sensitive sector to QE, causing more and more concern among insurers and reinsurers, the non-life insurance sector should, however, not consider itself immune, because financial activity alone might no longer be sufficient in the search for profitability.

Optimal asset-liability management (i.e. based on a increased control of the duration mismatch and a diversification strategy) is proving, more than ever, to be the most appropriate response insurance companies have for dealing with a deteriorated macroeconomic situation – a situation for which it would be hard to see a radical change in the coming years, even by the admission of Mario Draghi (2016). We understand the concerns of the Bernard Delas, Vice President of the French Prudential Supervision and Resolution Authority, who in 2016 stated that: “low interest rates act like a poison, the effects of which are unavoidable even if they appear slowly”, and according to him it is imperative that the market continues to adapt by changing its business model and building up the reserves it might need tomorrow. In the absence of adequate measures being taken with sufficient

foresight, low interest rates will become, in the medium and long term, a threat to the profitability and solvency of the market, and insurers will be weighed down with risks that they will find increasingly difficult to bear”.



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