ECMI Annual Conference 2015

Session 2: Quantitative easing, asset prices and economic growth

The impact of low interest rates on insurers and banks

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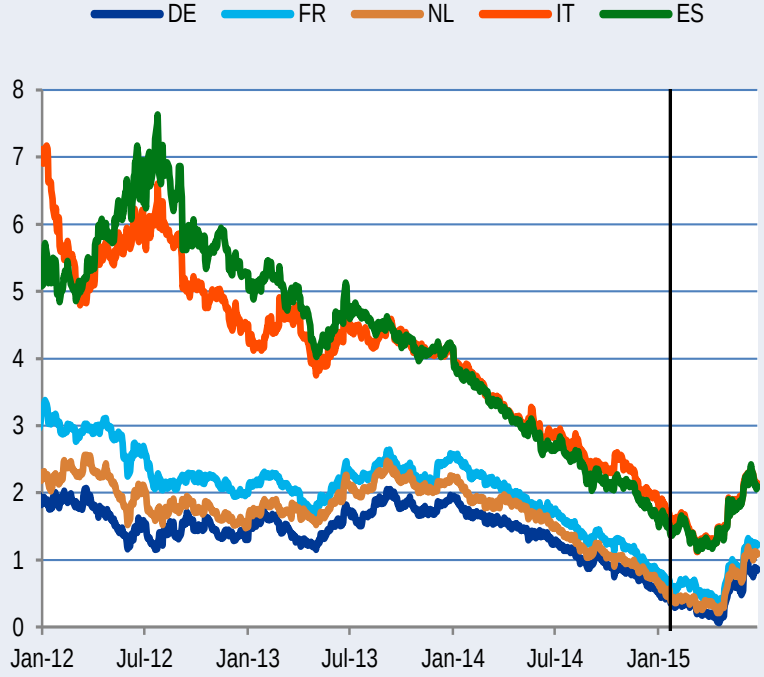
Introduction

- Long-term bond yields have been trending down for a prolonged period of time
- …but some resurgence in volatility since mid-2015 (see Vstoxx index)

Sovereign bond yields for selected euro area countries

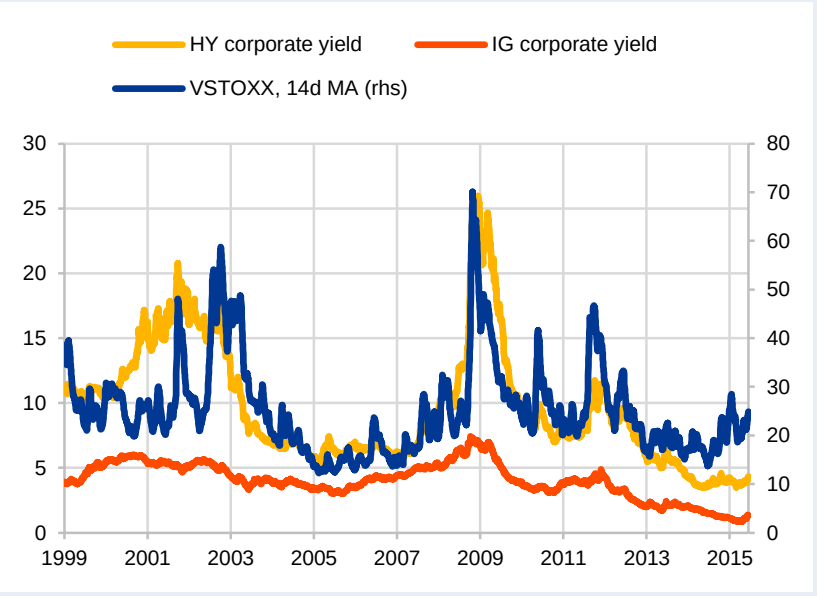
(percentages per annum, Jan. 2012 – Jul. 2015)



Sources: Bloomberg
Notes: The line refers to 22 January 2015 which was the date when the extended APP was announced.

Eurozone corporate bond yields and financial market volatility

(Jan. 1999 – June 2015)



Sources: Bloomberg

Note: percentages (lhs), index (rhs)

Introduction

- What is the impact of QE/low interest rate environment on the risk taking of financial institutions?
- With very low interest rates, banks and insurers may become desperate for higher returns and shift toward riskier investments
- Regulators are concerned of such behaviors with the financial crisis fresh in mind: very low interest rates could be fueling speculative asset bubbles
- Challenge for regulators: the evidence of reaching for yield/risk taking is hard to come by:
  - Look at prices: but difficult
  - Look at supervisory data (balance sheet data)
  - Look at behaviors:
    - non-price terms (investors can make loans with fewer “covenants”)
    - Surveys on financial institutions

Outline

1. Introduction

2. Impact on Insurers

- Results of EIOPA surveys
- « The hunt for yield: not waving but drowing? », Domanski et al. (2015)
- Search for yield: flight from quality ? Evidence from EU and FR data
- Adaptation of business models going forward

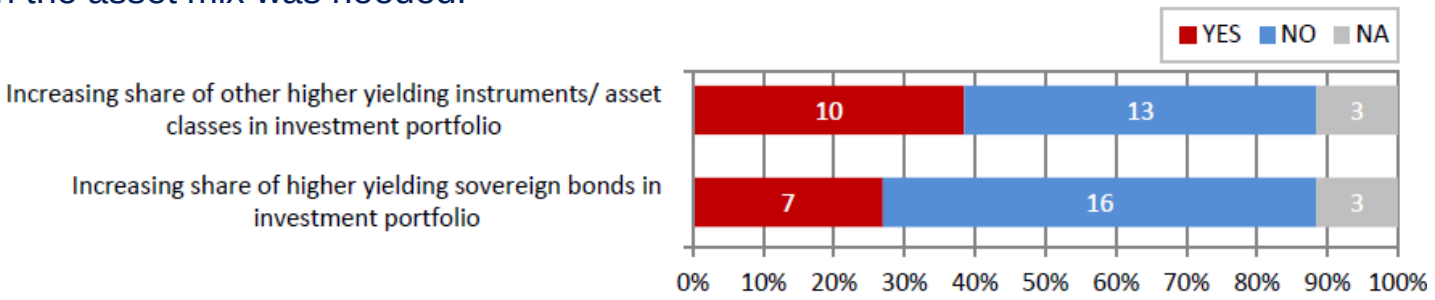
2. Impact on Banks

- impact on banks' profitability and banks' adaptation
- Some particularities of French banking system
- impact on banks' risk taking behaviors
- impact on the risk-taking in the provision of credit

1.1. Impact on Insurers
A Search for yield?

Qualitative examination: EIOPA surveys

- **No overall trend towards a search for yield** (EIOPA LIR* exercise 2014)
  - EIOPA assess that, although some insurers are increasing their share of higher yielding instruments or asset classes in the investment portfolio, **the overall trend is not yet remarkable**.
  - **Less than half of the 26 participating authorities reported an increase in the share of higher yielding instruments or asset classes**, and around 25 % pointed to an increase in the share of higher yielding sovereigns.
  - **Several companies indicated that they already had the adequate asset structure in place to cope with a long-lasting low interest rate environment** and therefore no immediate change in the asset mix was needed.



Source: EIOPA LIR exercise 2014

*Low interest rate environment stock taking exercise 2014

1.2. Impact on Insurers

Search for yield: towards a greater duration?

Focus on « The hunt for yield: not waving but drowing? », Domanski et al. (2015)

- **Goal:** Examine to what extent portfolio adjustments by long-term investors in anticipation of ECB QE may have exacerbated the rapid decline in long-term interest rates in 2014 and into early 2015

- **Hypothesis:** The fall of the term premium is not solely due to investors looking for riskier assets (and better yields), but is also in part the consequence of a “hunt for duration”, i.e. an attempt to contain duration mismatches in the context of falling long-term interest rates

- **Key findings from the model**
  - The demand function is not monotonous
  - inverted for low values of interest rates

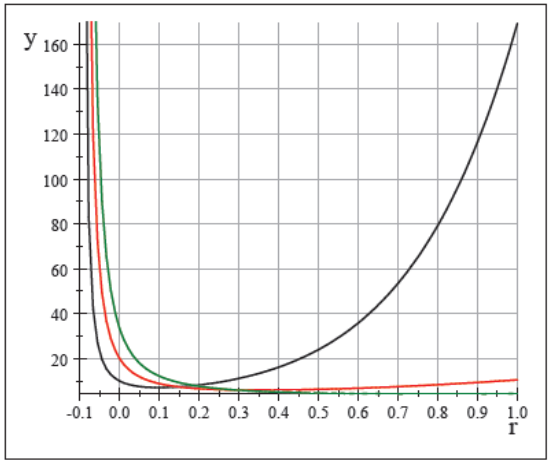


Figure 3: Plots of the holding of the benchmark bond y in the immunising portfolio; black line is for $T = 10$, red line is for $T = 5$, green line is for $T = 3$.

- **Consequence**

  Such a behavior may result in a vicious circle:
  - Falling rates might foster insurers’ investments in longer term bonds
  - This, in turn, may push further down long-term interest rates

1.3. Impact on Insurers

Search for yield: towards a greater duration?

Focus on « The hunt for yield: not waving but drowing? », Domanski et al. (2015)

- **Key observations from the data**
  - Data was provided by Bundesbank on aggregate bond holdings by the German insurance sector
  - Asset duration did increase in response to the rising duration of liability

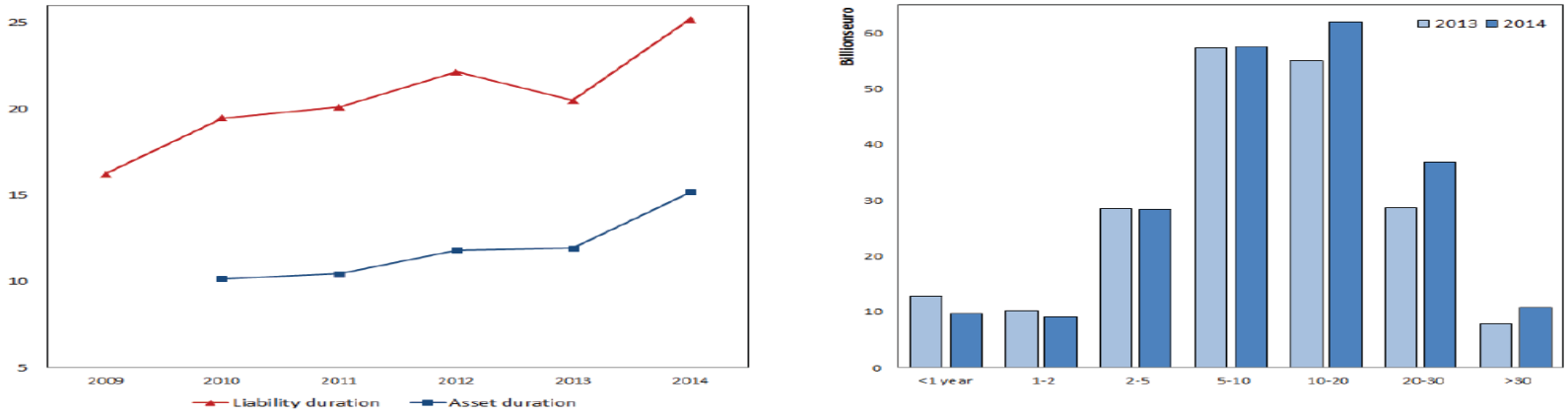


Figure 5: Trends in duration mistmatch (left); and maturity extension of bond portfoilio between from 2013 to 2014, nominal values (right). Notes: Duration of liabilities calculated assuming a growing perpetuity discounted using euro swap rates, with 2013 value benchmarked off of EIOPA stress test figure for Germany; duration of bond holdings calculated assuming zero-coupon bonds; the resulting duration gap does not account any offsetting effects from the use of swaps and derivatives.

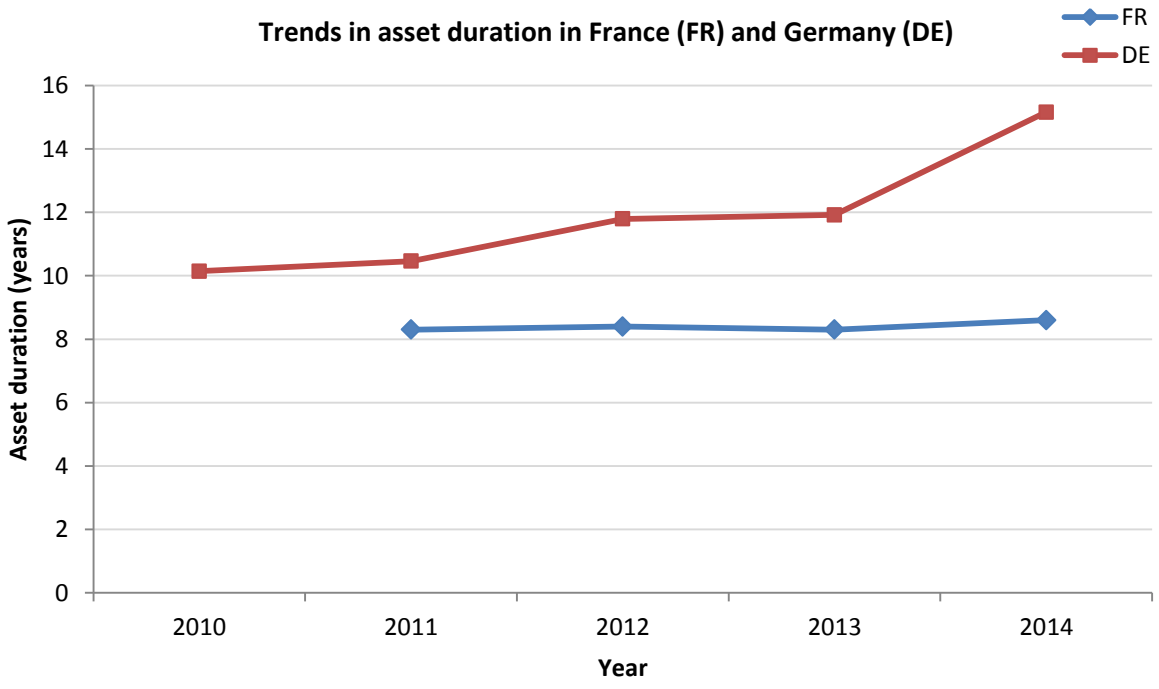
- Econometric regressions confirm that the demand curve inversion is specific to the insurance industry, which, the authors argue, reinforces their hypothesis that the inversion comes from a duration-driven strategy

1.4. Impact on Insurers

Search for yield: towards a greater duration?

Darpeix et al. (2015): Comparison between Germany and France

- According to data from Darpeix et al. (2015), the French insurance market has not experienced such a rise in the asset duration, but a minor increase of 3.6% between 2013 and 2014
- This could reflect the presence of structural differences between both markets



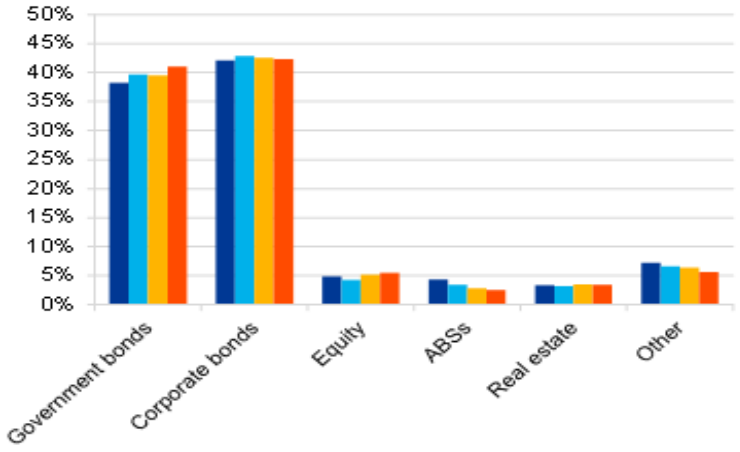
1.5. Impact on Insurers

Search for yield: flight from quality ?

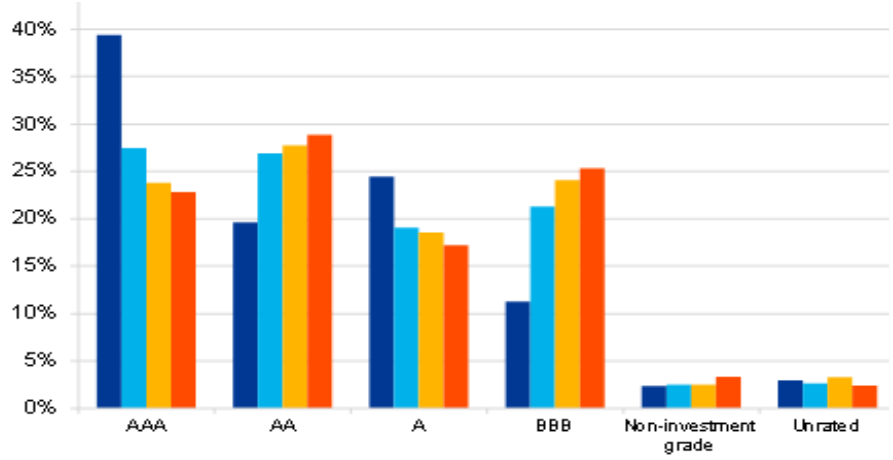
European Insurance Portfolio Review

- **A stable asset class distribution…**
  - The bond portfolio remains, by far, the most material asset category for insurers ; mostly investment grade bonds;
  - Investments in equities, ABSs and real estate still remain modest.
- **… but a slight trend to lower credit ratings**
  - An overall trend towards lower credit ratings is remarkable (from AAA to AA, from A to BBB)
  - Other factors could also be the motive of the trend : capital optimization, downgrades,…

Investment portfolio split of selected large euro area insurers (from 2011 to 2014)



Bond investments in selected large euro area insurers split by rating category (from 2011 to 2014)



Sources: JPMorgan Cazenove, individual institutions' financial reports (based on 15 large euro area (re)insurers)

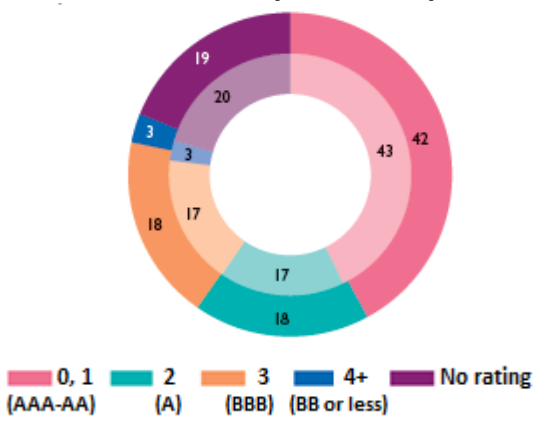
1.6. Impact on Insurers

Search for yield: flight from quality ?

French Insurance Portfolio Review

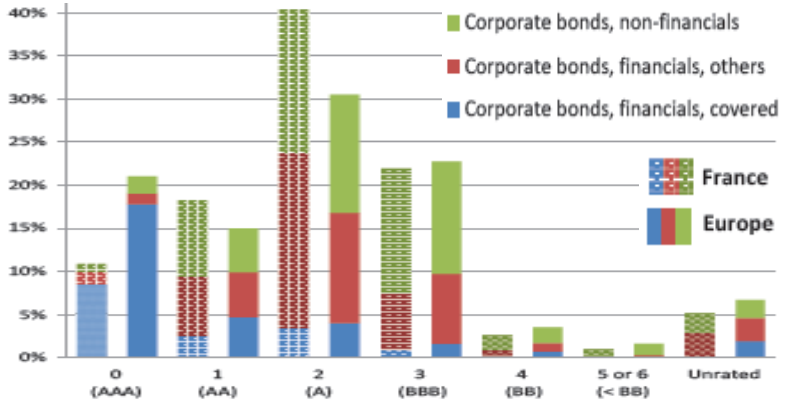
- **Quite steady distribution of bonds ratings**
  - Share of investments grade bonds has been slightly bigger in 2014 (+1.3pt to 78.2 %).
  - But we see an increase in the lowest classes (A and BBB rated bonds with +0.8pt and +1.2pt) and a decrease in the highest quality classes bonds (AAA , AA).
- **Corporate bonds allocation**
  - At YE2014 French insurers' corporate bonds portfolio has less of AAA corporate bonds compared to the European portfolio.
  - Financial institutions form more than half of the corporate bonds issuers (55% vs. 62% for the European insurers portfolio) .

Bonds portfolio by ratings as YE2014 (outer circle) vs. YE2013 (inner circle)



Source: Banque de France

Corporate bonds allocation by ratings and issuers types for French and European insurers

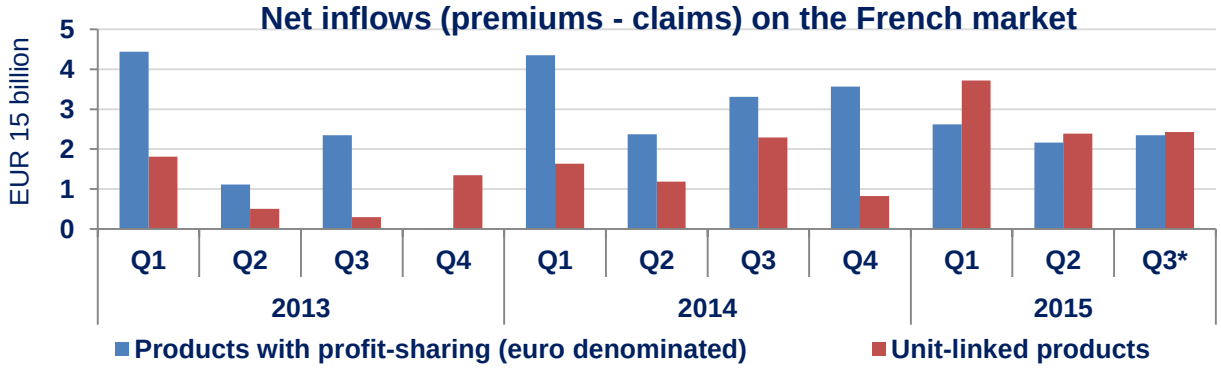


Source: ACPR, EIOPA Insurance Stress Test 2014 ; Note: Europe includes France

1.7. Impact on Insurers

Adaptation of business models to the LIR environment going forward

- **Significant sales of unit-linked products**
  - The Euro-denominated contracts are still the life contracts most held (83% of provisions), but **sales of unit-linked products have sharply increased since the beginning of the year** and net premium in unit-linked products now overpass net premium in euro denominated products.
  - The new prudential framework also explains this growth of unit-linked products.



- **Downward trend of rates on life contracts**
  - The **guaranteed rate** on new business is largely established at 0% currently.
  - The **participation rate** on life contracts in France has been reduced from 4.1% in 2007 to 2.5% to 2014.

- **Diversification of liabilities**
  - Diversification strategies take place towards activities less sensitive to interest rate risks (health/protection, general insurance).

2.1. Impact of QE/low interest rates on banks

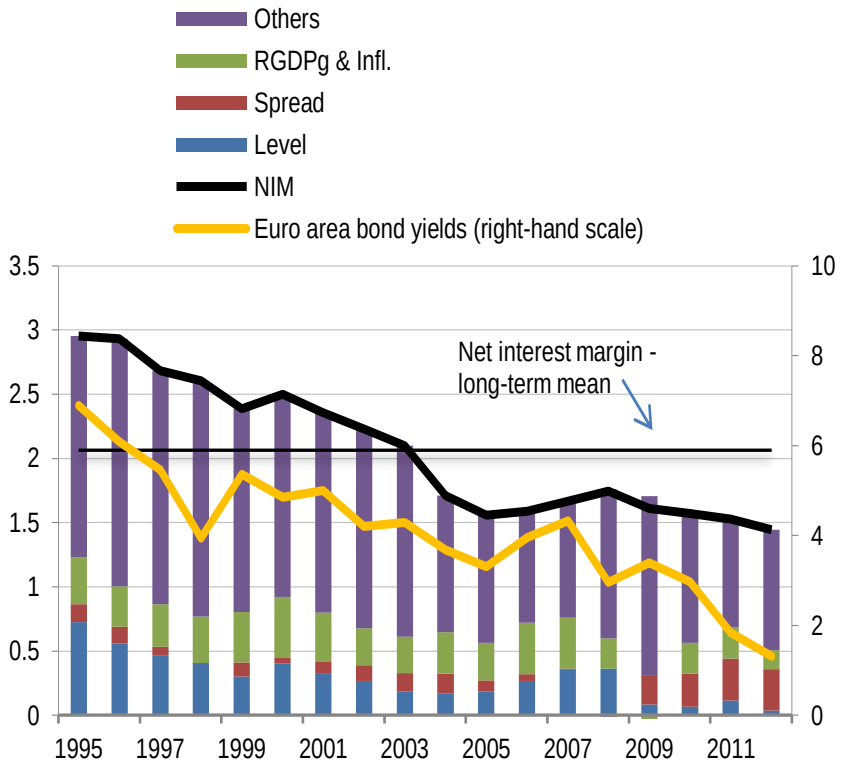
- **A prolonged period of low interest rates (LIR) and notably its negative impact on banks' net interest income affects banks' strategies towards looser risk tolerance.**

- **Banks generally follow 'absolute return' strategies pushing them to search for yield by:**
  A. Increasing riskiness of exposures or investing into high-duration assets
  B. Increasing the share of trading activities and fee income
  C. Offsetting the decreasing net interest margin by higher volume of loans and lower credit standards

- **Other effects of LIR/QE:**
  i. Low interest rate environment incentivizes banks to engage into carry trades which may result into vulnerabilities in case of sudden reversal
  ii. QE might reduce market volatility which is bad for investment banking securities trading revenues
  iii. In low interest rate environment, incentives may become distorted, mispricing of risk may occur. Banks may over-invest in assets with higher duration. If interest rates rise unexpectedly, the value of those assets would fall.
  iv. Increasing asset prices as a result of QE may lead on one hand to profit frontloading and to limited reinvestment opportunities on the other hand.

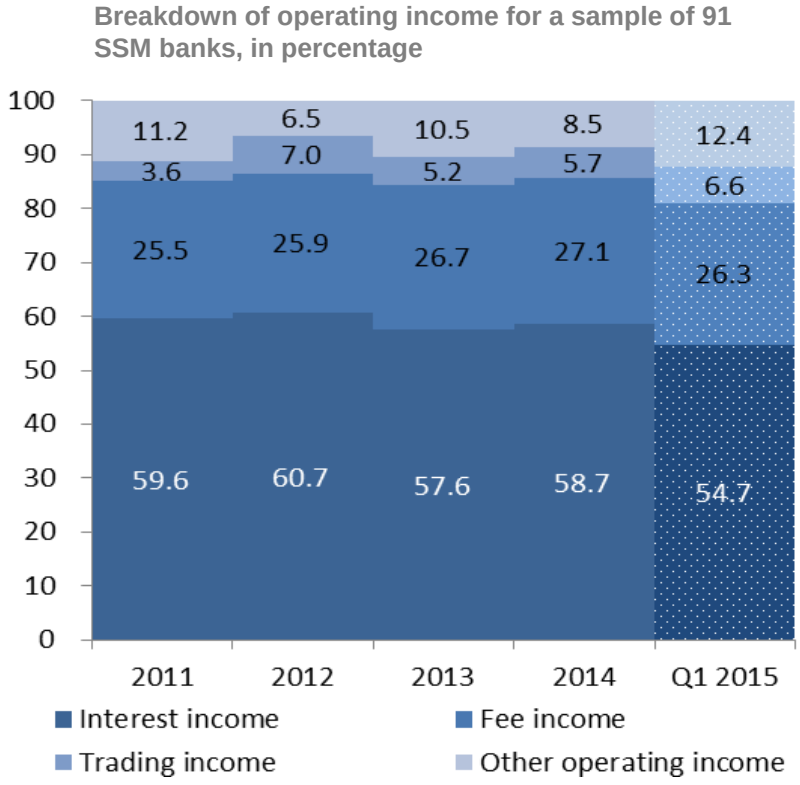
2.2. Banks: impact of LIR on banks' profitability and banks' adaptation

Net interest margin is impacted by the low interest rate environment
(Annual data, 1995 - 2012)



Sources: Thomson Reuters Datastream

Banks are looking into other sources of revenue to compensate for decreasing interest margins …
(2011 – Q1 2015, shares)



Sources: SSM supervisory information (FINREP and STE) for 91 Significant Institutions

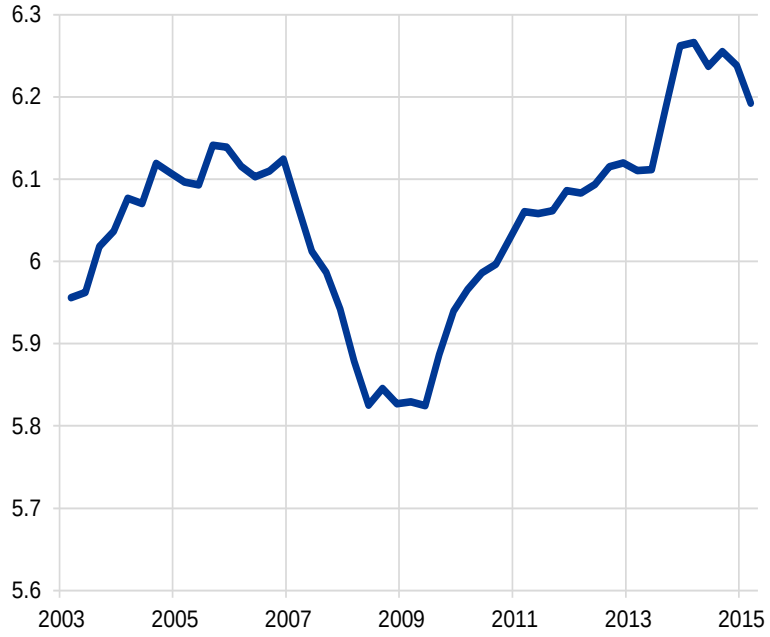
Some particularities of French banking system

- On the asset side
  - larger share of loans is granted at fixed rate, 57% for the 5 largest banks (BNPP, GCA, SG, GBPCE, and GCM) at the beginning of 2014.
  - the negative impact of low interest rates may be attenuated
  - However, the renegotiations of loans rates contribute to reduce banks' NIM in low interest rate environment
- On the liability side
  - the share of deposits in the financial liabilities amounted to 58% for the 5 largest banks in 2014
  - regulated savings represent a significant share of French banks' liabilities: In 2014, the stock of Livret A represented about EUR 230 billion
- A model of the NIM is estimated for French banks
  - the aggregated net interest income was EUR 70.4 billion in 2014
  - We consider two scenarios and the impact on the aggregated NIM is:
    - A decline in the interest rate spread of -0.78 percentage points: NIM declined by EUR 4.6 billion
    - Changes in 3 month Euribor (-0.01) and 10 year long term French government bond rates (-0.53) : NIM declined by EUR 5,3 billion

2.3. Banks: impact of LIR on banks' risk taking behaviours

The low interest rate environment has contributed to banks extending their asset maturities …
(Q1 2003 to Q1 2015)

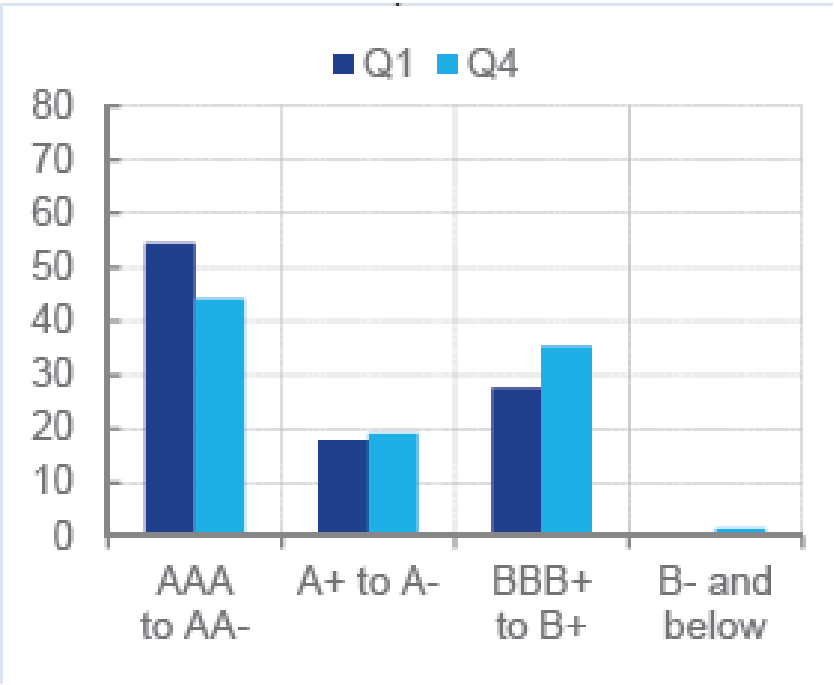
Estimate of average asset maturity of euro area MFIs, in years



Source: ECB Balance Sheet Items

… and investing towards riskier asset classes
(2014Q1 – 2014Q4)

Banks' holdings of newly issued securities in the euro area: distribution across rating classes (per cent)

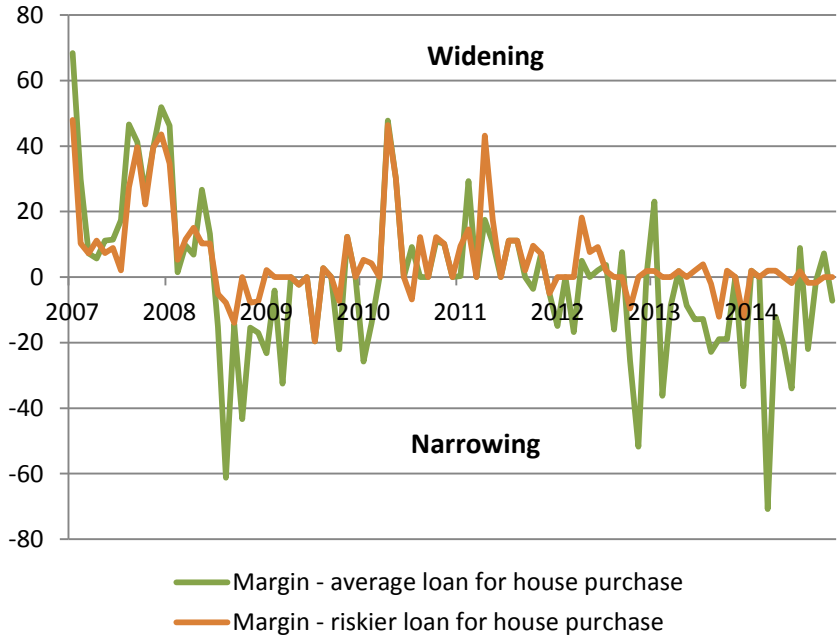


Source: ECB

2.4. Banks: impact of LIR on the risk-taking in the provision of credit

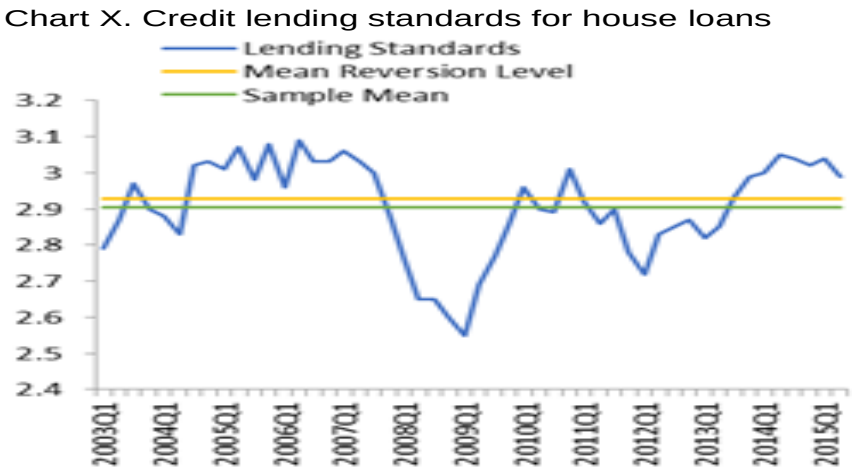
- In terms of search-for-yield, the Bank Lending Survey shows some containment:
  - Narrowing of margins for average loans acute since 2012 but no significant narrowing for riskier loans
  - Credit lending standards for house loans (euro area): same levels as in 2005-2007.

Evolution of loan margins based on the Bank Lending Survey for France



Source: Banque de France

Credit lending standards based on BLS for the euro area

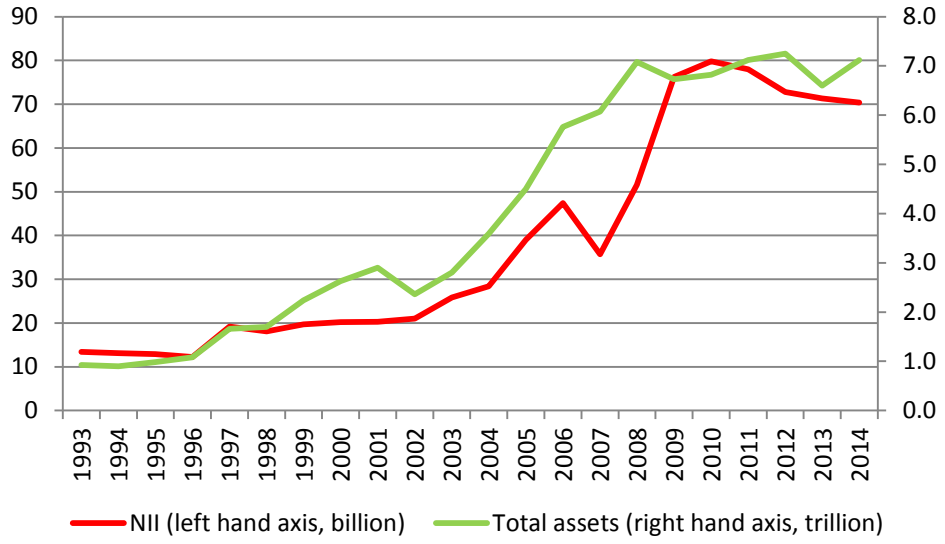


Source: ECB

ANNEX

Evolution of the French banks' aggregated Net Interest Income

Evolution of the French banks' aggregated Net Interest Income (NII) and Total Assets (1993-2014)



The current pressure on the revenues of retail banking activities is due to the evolution of the Net Interest Income.

Whereas the total assets is one of the main driver of the Net Interest Income, the current environment deserves an analysis of the margin rate.

I. Introduction

For banks, interest rate risk is mainly associated with

- ***repricing risk*** of bank assets, liabilities, and off **balance sheet** positions
- ***yield curve risk*** *which* may have negative impact on **bank's income**

The impact of an increase in interest rate notably depends on

- the bank's **balance sheet structure**
- the relative importance of **fixed rate vs floating rate assets**
- the share and characteristics of non-maturing deposits (NMDs)

A rise in interest rate could have a positive effect on bank's income

- Low interest bearing deposits are invested at higher rates

Low interest rates can lead banks to modify fees that are charged for NMDs and/or increase more risky trading activities

II. Objective

- We assess the impact of changes in interest rates on French banks' net interest margin (NIM)
- We use an econometric model which allows to isolate the effects of interest rates changes from those of other variables such as the volume of credit
- We derive the economic effect of changes in interest rate using the estimation of this model

III. Some particularities of French banking system

- On the asset side, an important characteristic of the French banking sector is that a larger share of loans is granted at fixed rate, 57% for the 5 largest banks (BNPP, GCA, SG, GBPCE, and GCM) at the beginning of 2014.

- On the liability side, the share of deposits in the financial liabilities amounted to 58% for the 5 largest banks in 2014.

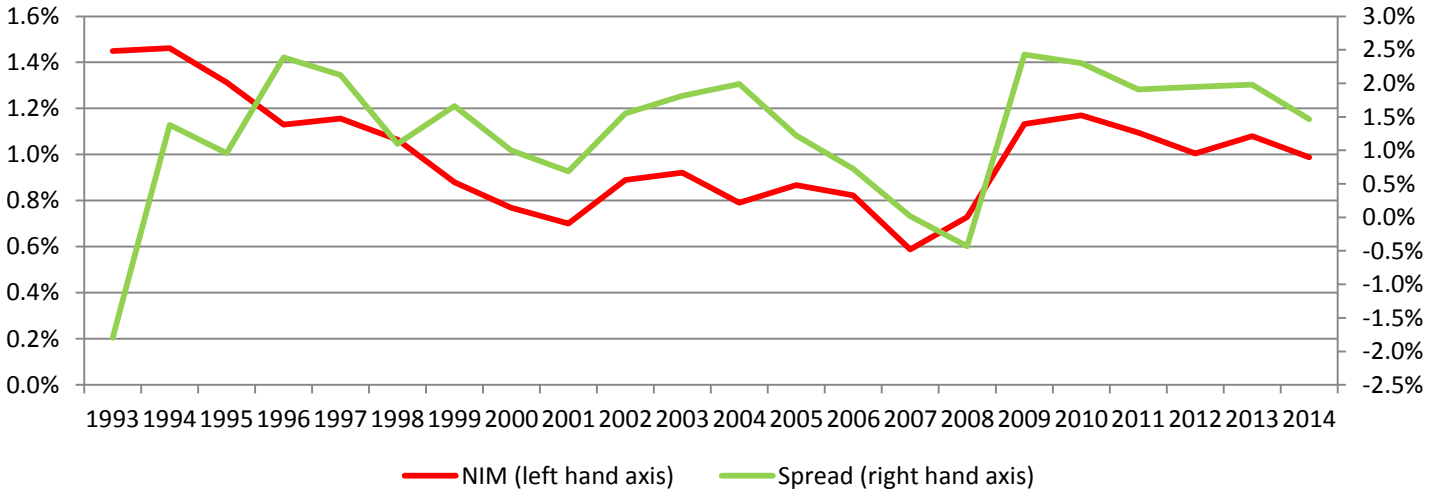
- NMDs are generally not remunerated

- Regulated savings represent a significant share of French banks' liabilities
  - In 2014, the stock of Livret A represented about EUR 230 billion

IV. Empirical evidence
4.1. Data and methodology

- We use ACPR data collected from accounting reports (BAFI, SURFI, and FINREP)
- We retain only the banking groups at the highest consolidation level
- We end up with a sample of 89 French banking groups over the period 1993-2014
- We insure keeping the same definition for the variables used in the model thanks to the good documentation of the reports
- We neutralized the highest changes in total assets corresponding to M&A

IV. Empirical evidence
4.2. Stylized facts



- The ratio of net interest margin to total assets decreases between 1993 and 2001
  - Total assets increase faster although net interest income also increased
- We observe an upward trend between 2007 and 2010
  - During the crisis, we assist to a decline in trading activity and a greater reliance on traditional activities
- NIM ratio and the interest rate spread seem globally positively linked

IV. Empirical evidence
4.3. Sensitivity of French banks' NIM to changes in interest rates (1)

- The following econometric model is employed to derive the sensitivity of NIM ratio to interest rates

$$Y_{i,t} = \alpha_i + \Sigma X_t \beta_j + \Sigma Z_{i,t-1} \theta_k + \varepsilon_{i,t}$$

- i is a subscript for the i[th] bank. t for the t[th] time period. α_i is the bank fixed effects
- $Y_{i,t}$ represents the **ratio of net interest margin to total assets**
- X_t designs **interest rate variables**
  - Successively the three-month Euribor (3 month Euribor), the ten-year French government bond rate (10 year French gov bond rate) and the spread (Spread) between both interest rates variables
- $Z^k_{i,t}$ controls for banks' specificities using variables reflecting the **structure of asset and liabilities**
  - loans and receivables without interbank loans divided by total assets and deposits without interbank deposit divided by total liabilities and equity

IV. Empirical evidence
4.3. Sensitivity of French banks' NIM to changes in interest rates (2)

Table 1: Impact of interest rates on French banks NIM

	(1)	(2)	(3)	(4)
$Spread_t$	0.083**		0.086***	
	(0.036)		(0.027)	
3 month $Euribor_t$		-0.099***		-0.104***
		(0.037)		(0.021)
10 year French gov bond $rate_t$		0.148***		0.139***
		(0.047)		(0.020)
$Credit_{t-1}$	0.017***	0.018***	0.021*	0.019*
	(0.003)	(0.003)	(0.011)	(0.011)
$Deposit_{t-1}$	0.011***	0.011***	0.008	0.007
	(0.003)	(0.003)	(0.012)	(0.011)
Constant	-0.219**	-0.468***	-0.277**	-0.356***
	(0.097)	(0.169)	(0.118)	(0.080)
Individual fixed effects	No	No	Yes	Yes
Number of banks	89	89	89	89
Adjusted R-squared	0.304	0.319	0.295	0.309

IV. Empirical evidence
4.3. Sensitivity of French banks' NIM to changes in interest rates (3)

- We find **a positive association between the ratio of net interest income and the interest rate spread**
- A decrease in interest rate spread by 1% reduce the net interest margin ratio by 8 bps (model 1 and 3)
- Banks interest income decreases faster than interest expenses
- In the French banking system, the negative impact of low interest rates may be attenuated by the fact that a significant share of the stock of loans is granted at fixed rate.
- However, the renegotiations of loans rates and some rigidities of the regulated saving rates may contribute to reduce banks' NIM in low interest rate environment
- Loans and deposits positively impact NIM ratio
  - Deposits (cheaper resource) allows financing a significant share of banks loans and contributes to reduce interest expenses.

IV. Empirical evidence
4.4. Economic impact (1)

Table 2: Economic impact of changes in interest rates on Net Interest Income

	Changes in interest rates			Impact on Net Interest Margin (EUR million)
	spread	3 month euribor	10 year gov bond	Banking system
Model 3	-0.78%	-	-	-4581.7
Model 4	-	-0.01%	-0.53%	-5258

IV. Empirical evidence
4.4. Economic impact (2)

- The estimations are made according to the aggregated total assets of the banking system in 2014 (EUR 7120 billion) and bank assets and liabilities are kept constant

- We consider two models:
  - the largest decrease in the interest rate spread observed on the period (-0.78), which occurred between 2004 and 2005
  - changes in 3 month Euribor (-0.01) and 10 year long term French government bond rates (-0.53) between 2013 and 2014

- **These decreases lead to a reduction in the net interest income by respectively EUR 4.6 and 5.3 billion**

- In comparison, the aggregated net interest income was EUR 70.4 billion in 2014