Who bears interest rate risk?

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EBA Workshop, November 28, 2018

Background and opportunity

- ✓ After three years of zero interest rates, and looking forward towards a gradual normalization of monetary policy …
  .. debate about winners and losers of this ultra low interest rate regime

- ✓ Redistributive effects:
  - ✓ within the banking system
  - ✓ between banking system and users (HH´s, NFC´s)

Aim of paper, data and methodology

- ✓ To measure interest rate risk (IRR) on a wide sample of European banks (104, covering 80% of total assets), using a unique pair of data sets:
  - ✓ Cross section of balance sheet data at end 2015, containing information on repricing maturity of assets and liabilities.
  - ✓ Transaction-level data on interest rate derivatives
  - ✓ Crossing the two data bases allows to estimate net IRR after hedging with derivatives

- ✓ Analysing differences in IRR across countries and business models: relating them to institutional settings, especially in the mortgage markets (bias to variable versus fixed rate)

Main results and policy implications

- ✓ Very low IRR on average, but large divergences, more significant across countries than across business models
- ✓ Countries with high share of variable rate mortgage display higher IRR
- ✓ IRR from loans displays higher dispersion than IRR from securities: some evidence of securities as hedge for loans
- ✓ Hedging through derivatives: on average banks hedge around one quarter of total IRR.
- ✓ Hedging more active by banks that diverge from their country norm

- ✓ Large heterogeneity across banks incorporates high redistributive effects
  - ✓ within the European banking sector, that can be clearly matched with country,
  - ✓ between the banking system and its users

General comment:

- ✓ Well focused paper, wide and highly representative sample, and appropriate estimation methodology, yields high support to the results, which are themselves quite intuitive.

- ✓ But IRR measured only at level of net interest margin (NIM) is a very partial approach, as it may leave aside some effects on other components of P&L that may be acting as natural hedge to pure IRR on NIM
  - ✓ Fees and commissions from managed assets
  - ✓ Capital gains from securities holding
  - ✓ NPL reduction due to low interest rate environment

  - ✓ A more comprehensive approach to IRR should look at aggregate P&L effects, or even market value sensitivity

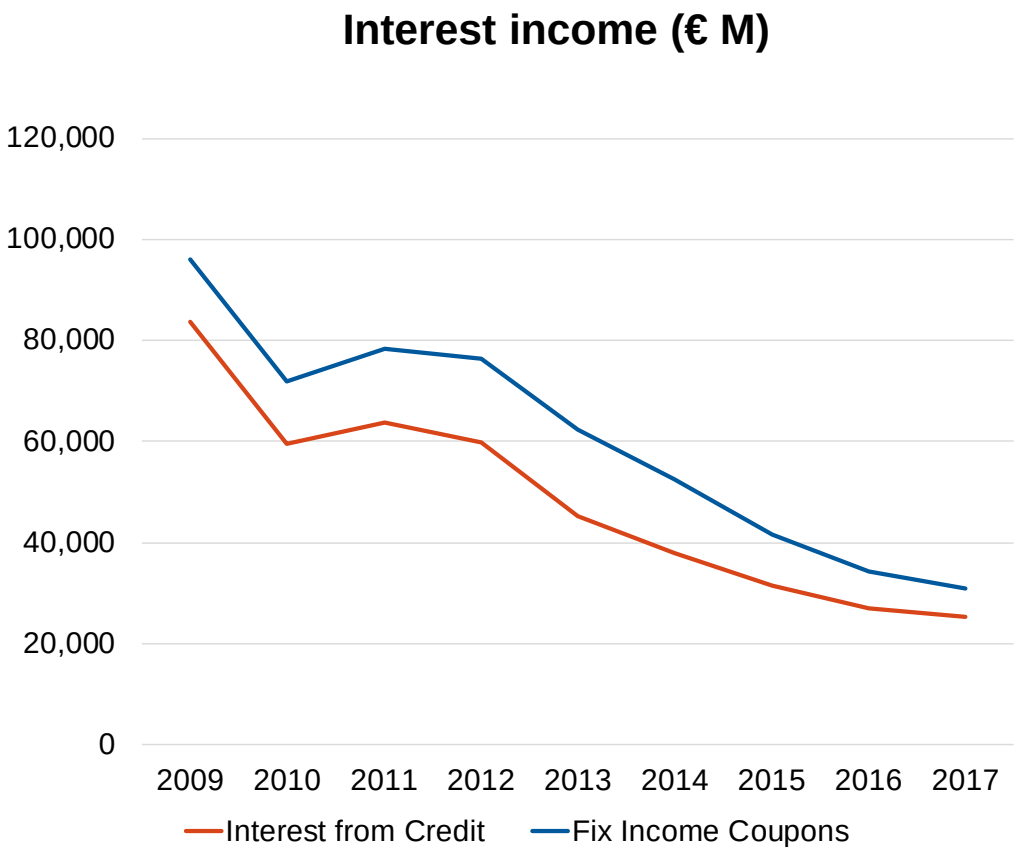
Some evidence from the Spanish Banking System suporting the “natural hedge” hypothesis

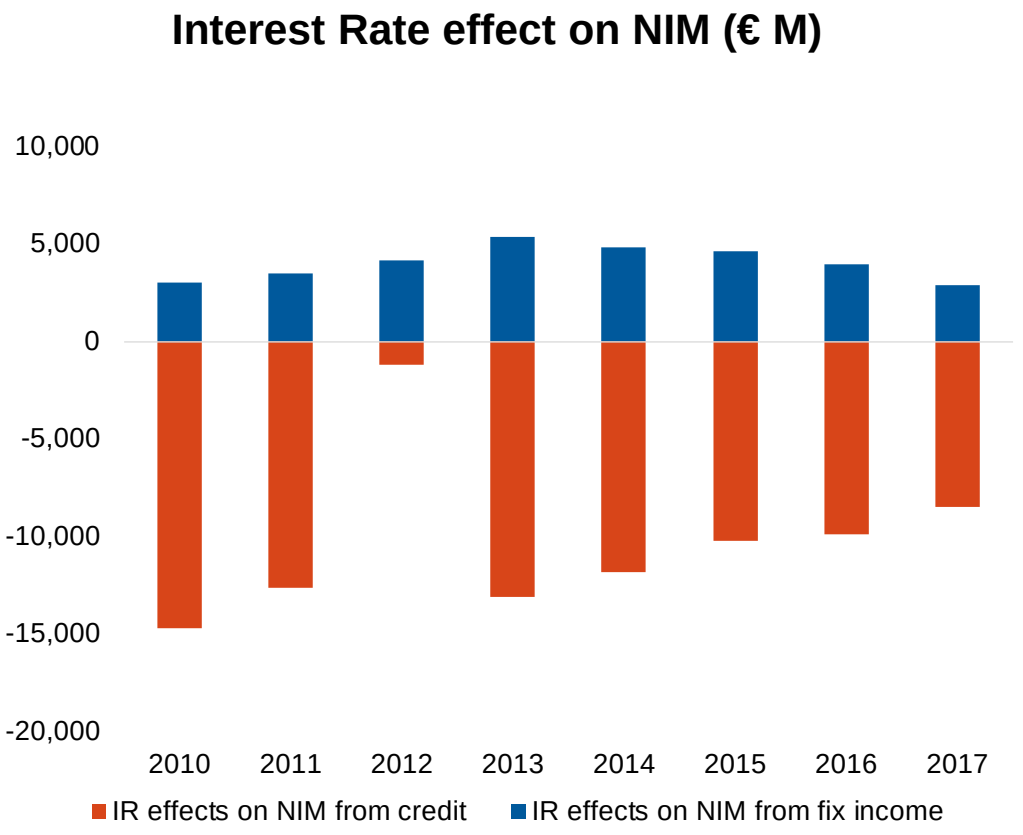
- ✓ Spanish Banking System (SBS) represents an interesting laboratory to extract some observed facts that may complement some of the hypothesis and conclusions from the paper.

- ✓ SBS especially appropriate due to:

  - ✓ Highly biased towards variable rate mortgages
  - ✓ High market power in deposit and asset management
  - ✓ High book of fixed income investments
  - ✓ Legacy NPL highly sensitive to interest rates

Negative IRR on loan book (variable rate mortgages)…

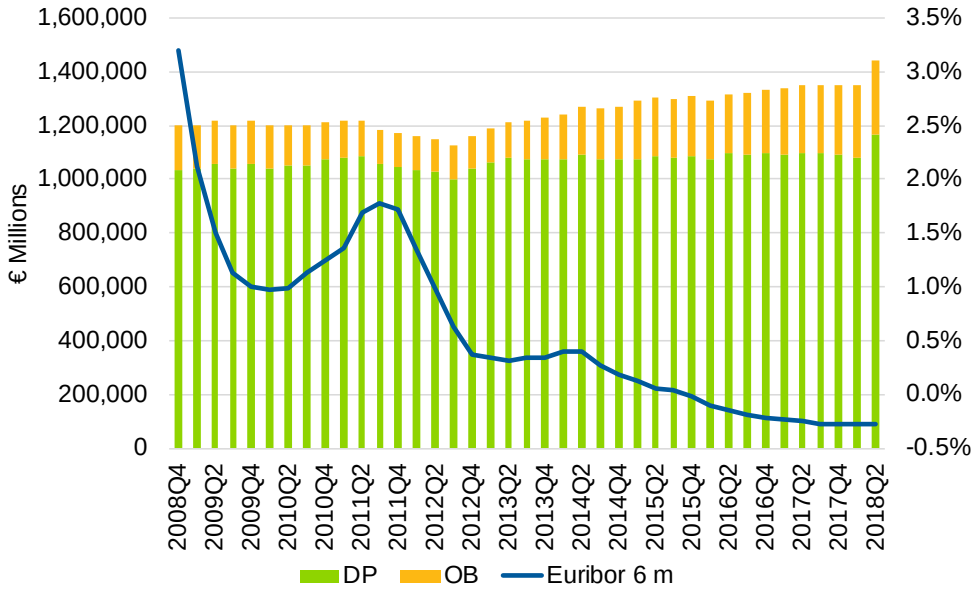




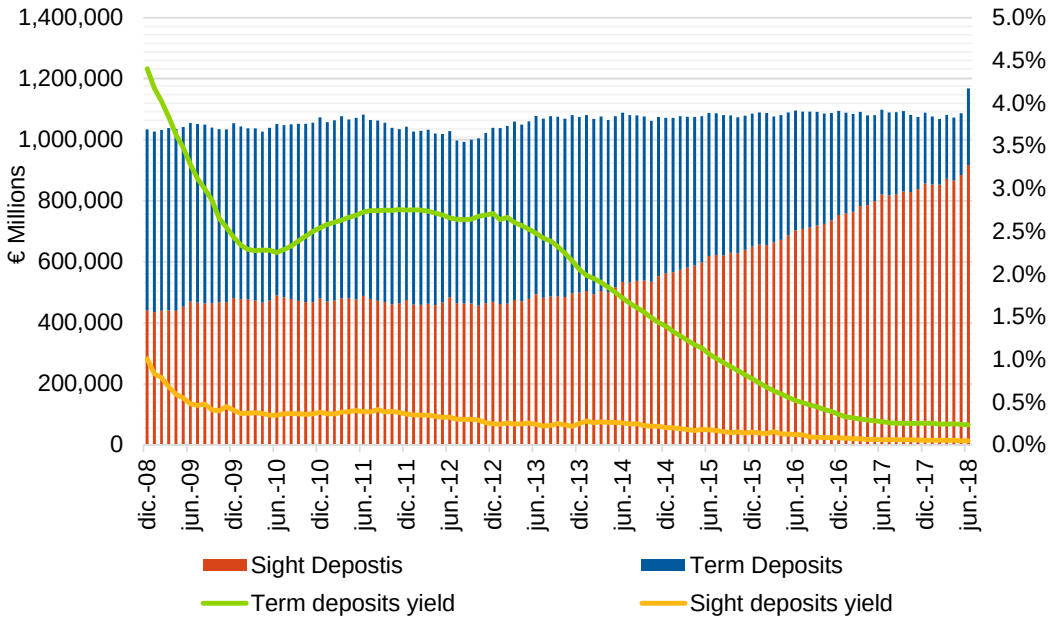
Source: Afi, BoS

… led to structural changes in customer funds

Deposits versus Off-balance



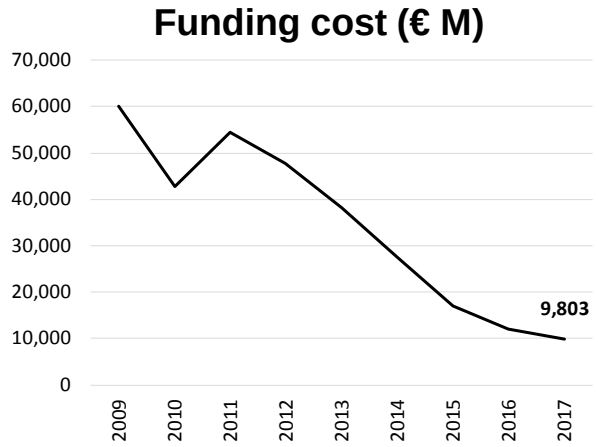
Deposits: Sight versus Term

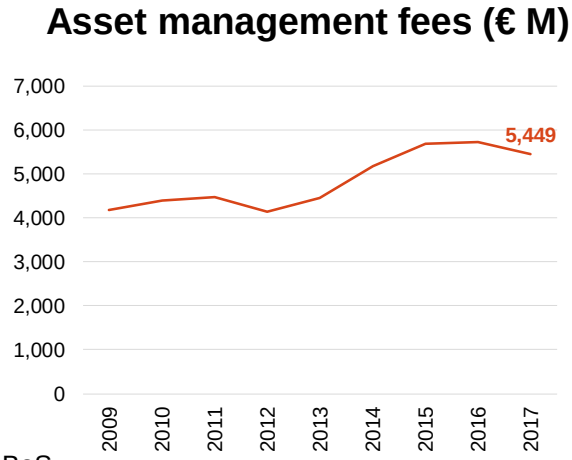


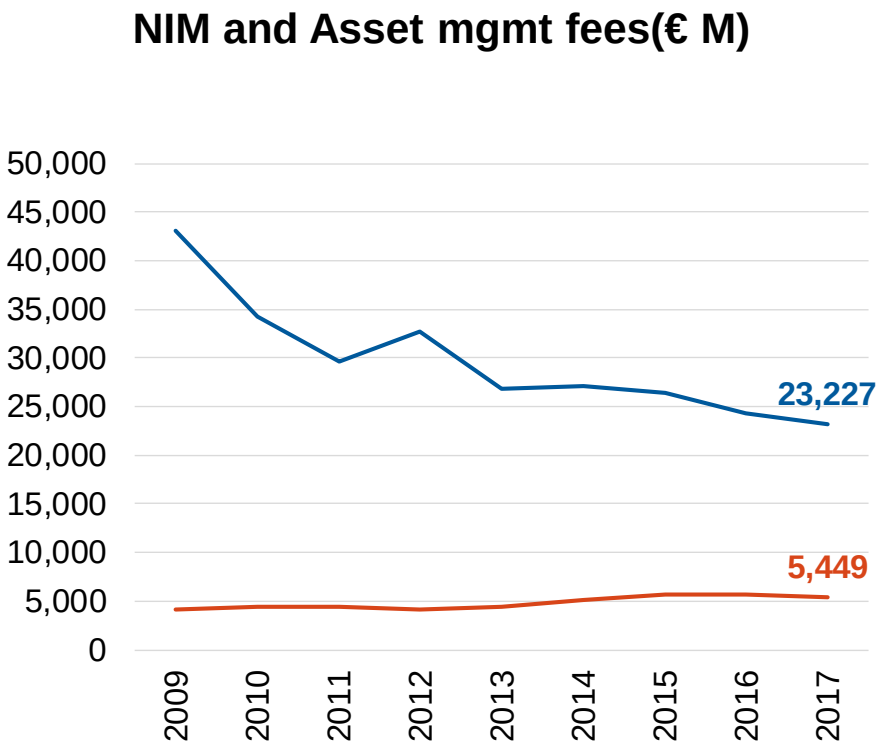
Source: Afi, BoS

Sources of natural hedge for negative IRR on loans

a) Reduction in funding costs
b) Increase in asset management fees



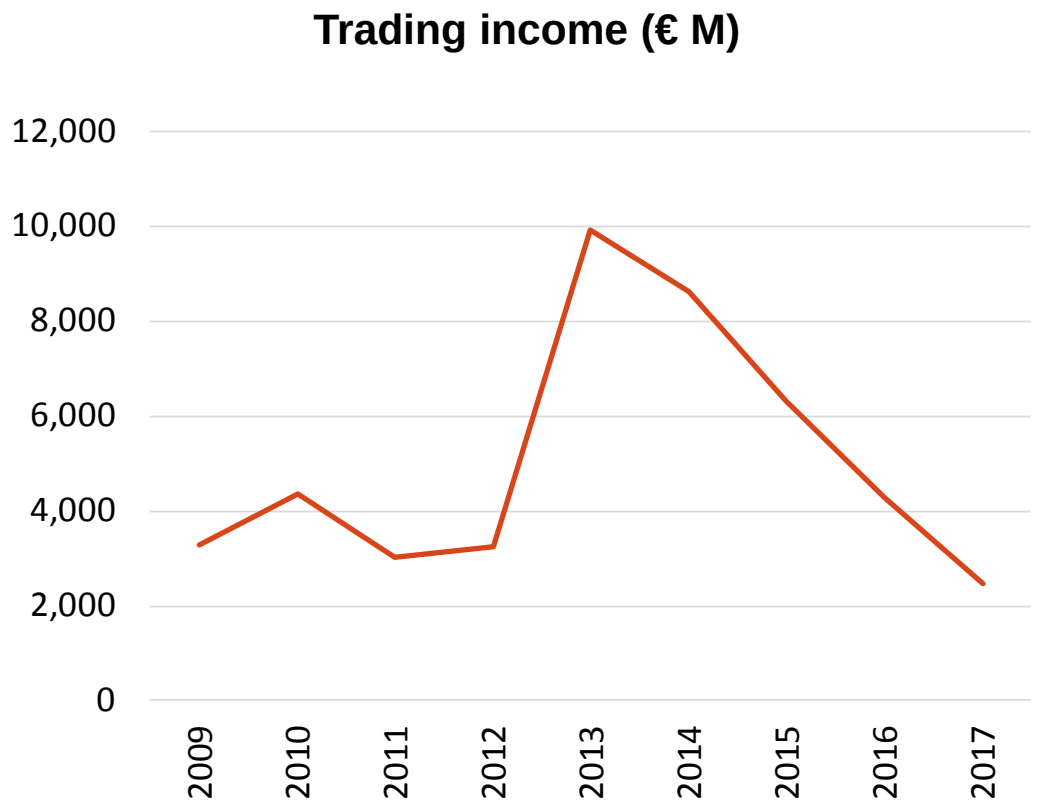




Source: Afi, BoS

Sources of natural hedge for negative IRR on loans

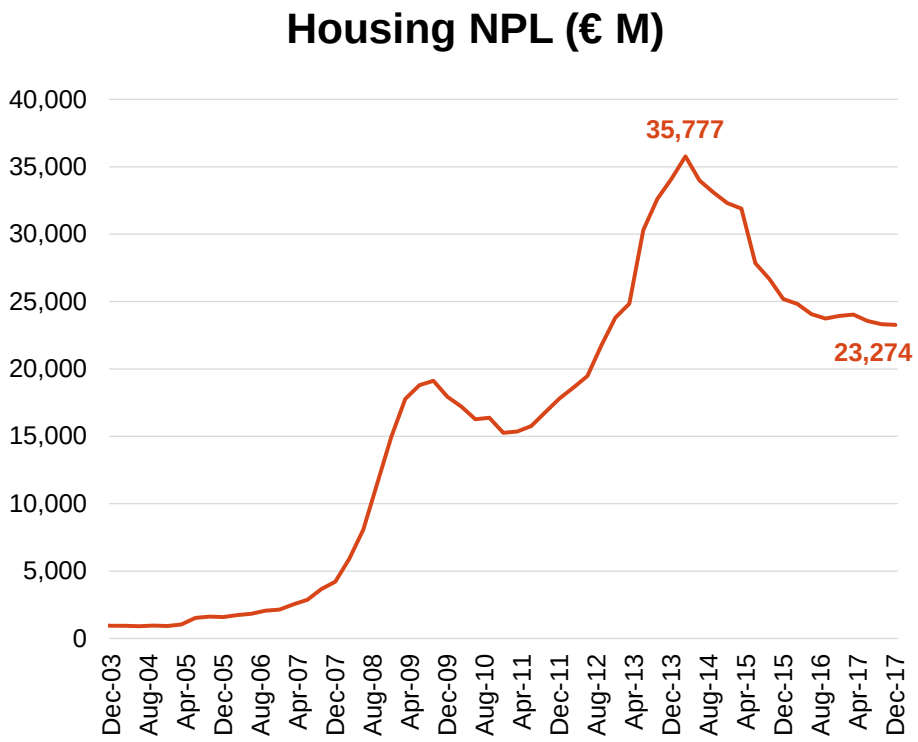
c) Capital gains from investments in securities: compensated 70% of IRR on NIM

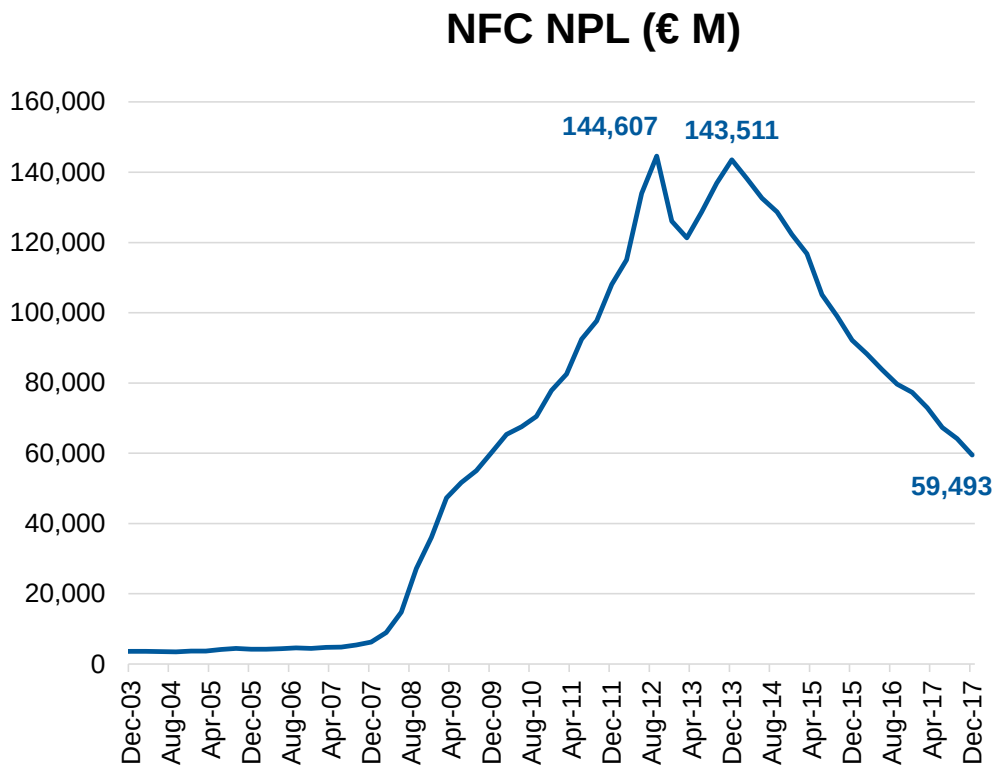


Source: Afi, BoS

Sources of natural hedge for negative IRR on loans

d) NPL reduction due to low interest rates: compensated 50% of IRR on loans





Source: Afi, BoS

Aggregate IRR on P&L (3% drop in rates over a decade)

- **Net effect on NIM: -48 billion**
  ¿reverse transformation…?
  … or mirroring positive exposures / natural hedges from:
  - Increased asset management fees: 8 billion
  - Net capital gains from fixed rate bonds: 35 billion
  - NPL reducction attributable to low rates: 25 billion
- **Aggregate effect: positive, despite negative NIM sensitivity …**
  …natural hedging, no need for derivatives!!

IRR: market value dimension

At the end of the day, IRR affects many constituents of the bank P&L (NIM, Fees, Trading book gains and losses, NPL) with different time spans, and in some cases with opposite sign.

The best way to aggregate all those effects on an actual basis (NPV) is to look at market valuation, and see how it responds to changes in interest rate expectations

Looking at index of quoted Spanish Banks (with an overall market share around 75%), for the last three year period:
Strong positive correlation (70%) between bank valuation and the slope of the Bund yield curve, capturing pure interest rate expectation, not credit risk.

Apparent contradiction?... Banks have benefitted from low rates, and now markets react positively when interest rates rebound …
… or is it a symptom of another "hidden natural hedge": yield curve slope reflecting better growth expectation.

Source: Afi, Factset

IRR: market value dimension

The positive correlation between bank valuation and slope of Bund yield curve is observed not only in Spain but in the largest European countries:

Italy (65% correlation), France (63%), Germany (49%)….

… and ever more strongly in the US: 88% correlation between banks´ market valuation and slope of US Treasury bond

Source: Afi, Factset