

**Peter Praet**

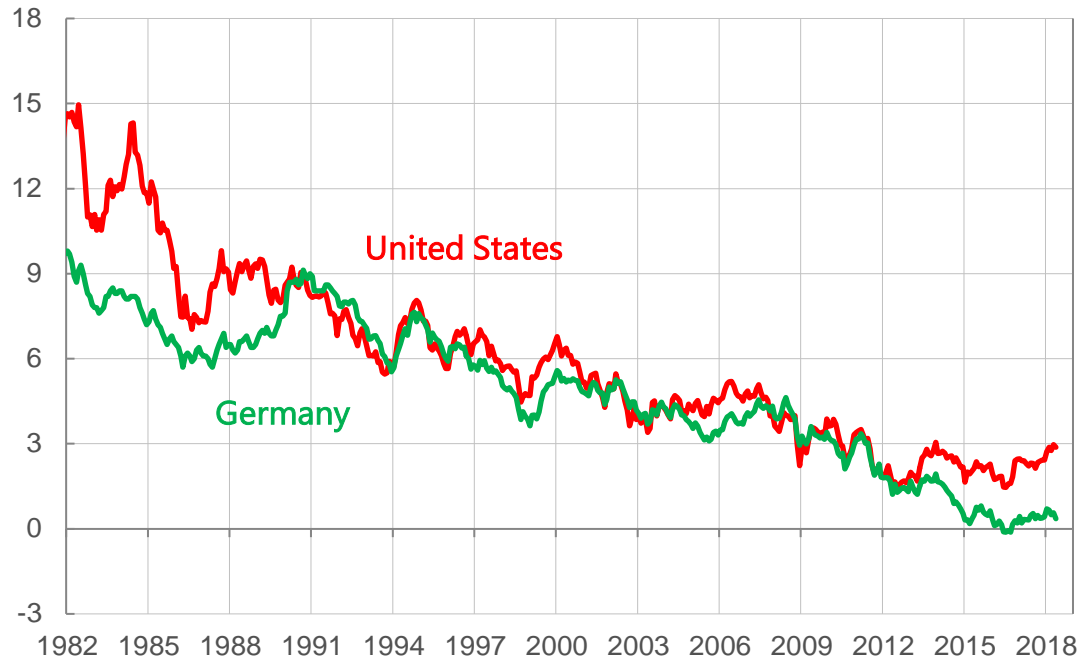
Member of the Executive Board of  
the European Central Bank

# Monetary policy in a low interest rate environment

Congress of Actuaries

Berlin, 6<sup>th</sup> June 2018

## Long-term government bond yields (10-year yields; percentages per annum)

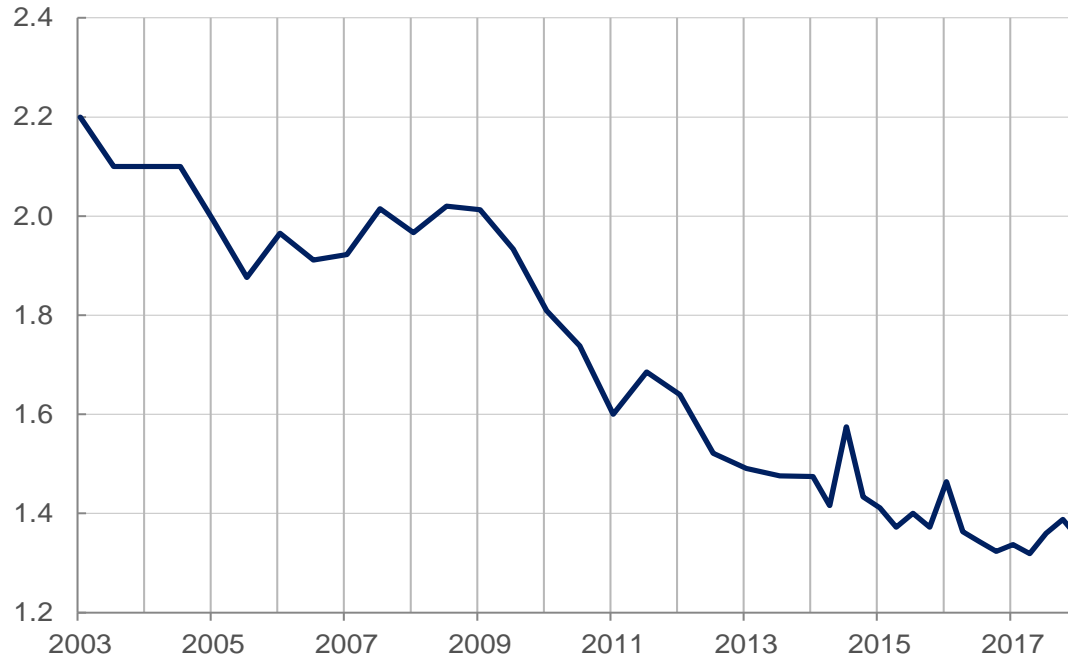


Source: ECB.  
Latest observation: May 2018.

## Long term interest rate: components

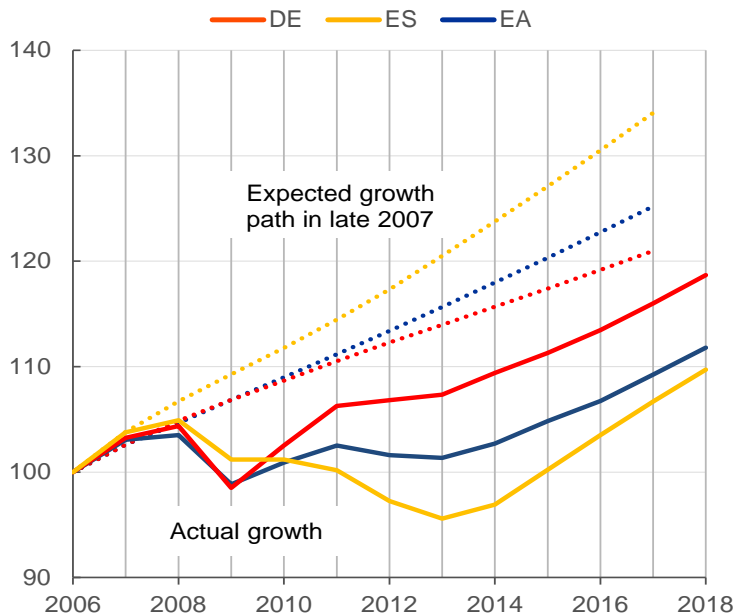
Expected real rate	Real term premium
Expected inflation	Inflation risk premium

## 5 years ahead growth expectations for the euro area (percentages per annum)



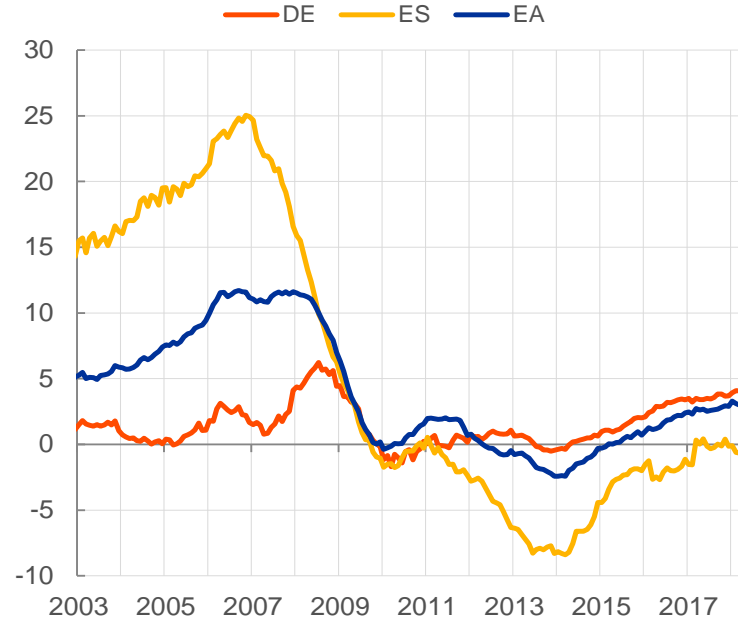
Source: Consensus Economics.  
Latest observation: Q2 2018.

## Real GDP & pre-crisis expected path index, 2006 = 100



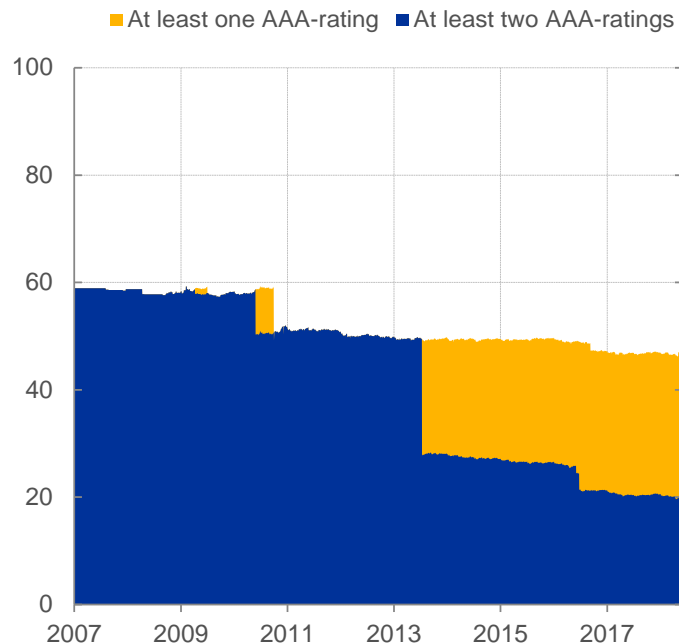
Source: Consensus and ECB calculations.  
 Note: Expected growth path as in Consensus October 2007.  
 Latest observation: 2018.

## Bank loans to private sector (annual percentage changes)



Source: ECB.  
 Notes: Adjusted loans (i.e. adjusted for sales, securitisation and cash pooling activities).  
 Latest observation: April 2018.

## Share of euro area sovereign bonds with AAA-rating (percent)

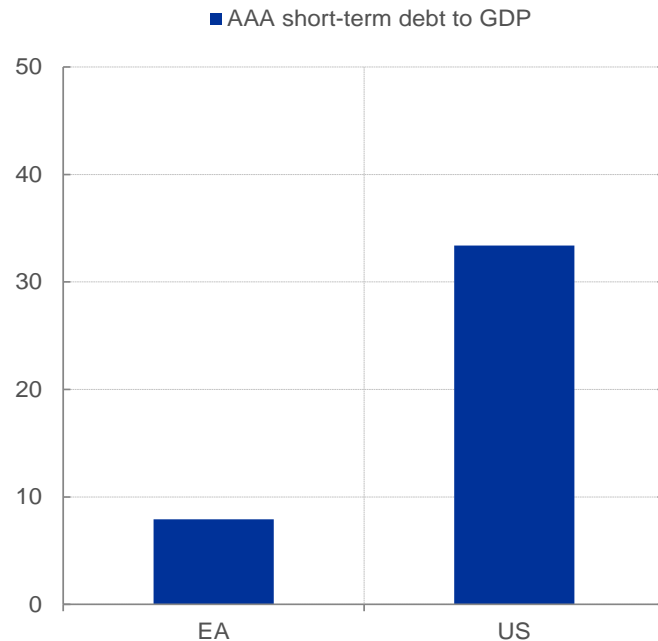


Source: ECB.

Notes: Ratings based on Moody's, Fitch, Standard & Poor's and DBRS.

Last observation: 31 May 2018.

## Share of short-term government debt with AAA-rating relative to GDP (percent)

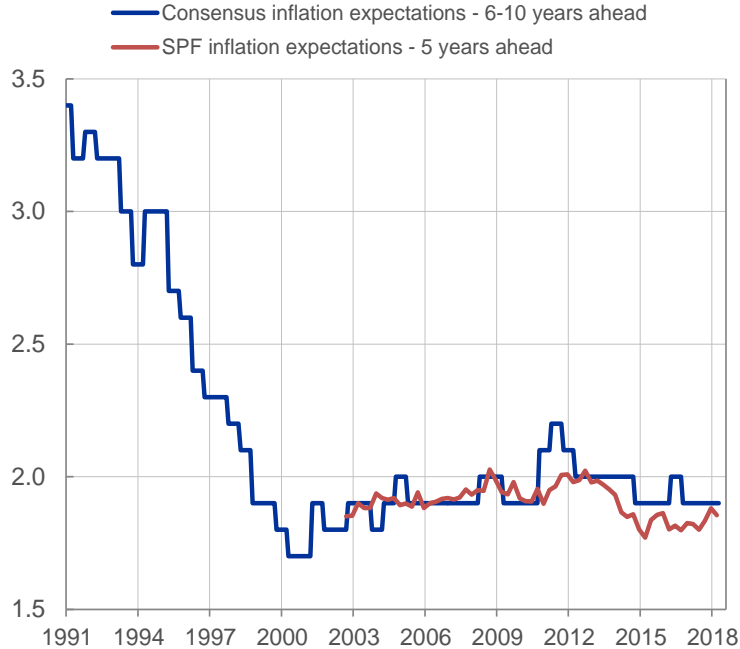


Source: ECB calculations.

Notes: Ratings based on Moody's, Fitch, Standard & Poor's and DBRS. AAA-rating based on at least one of its ratings being AAA. Short-term debt refers to securities with a residual maturity of up to and including 2 years.

Last observation: 30 April 2018 for government debt, end 2016 for GDP.

## Long-term inflation expectations (percentages per annum)



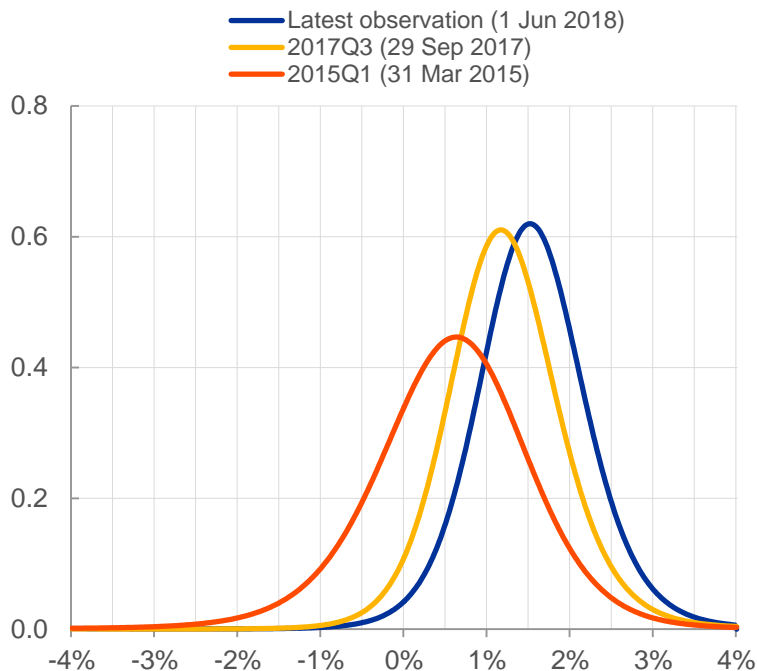
Source: Consensus Economics and SPF.  
Latest observation: Q2 2018.

## Euro area 5-year forward inflation-linked swap rate 5 years ahead (percentages per annum)



Source: Thomson Reuters.  
Latest observation: 4 June 2018.

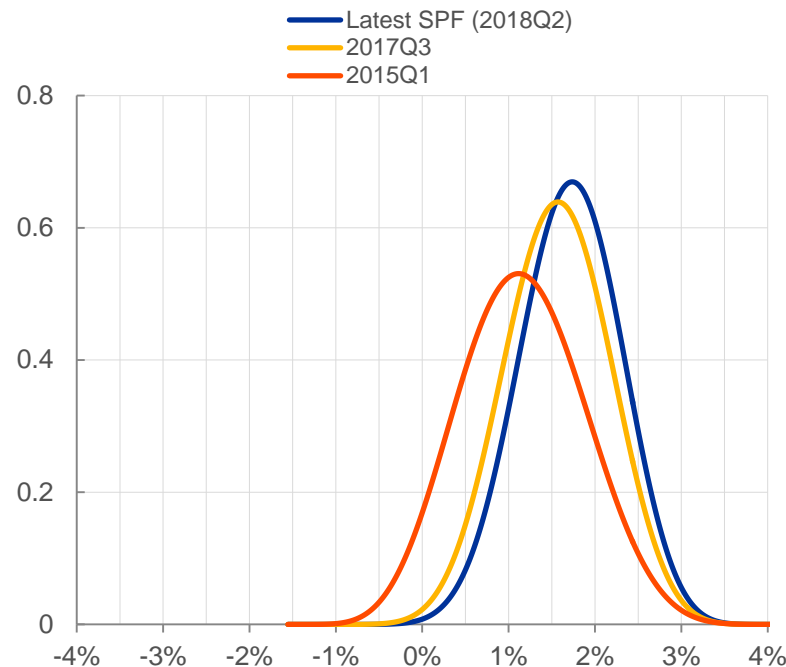
## Option-implied probability density function of euro area inflation over the next two years



Sources: Bloomberg, Reuters, ECB calculations.

Notes: This chart shows the risk-neutral probability distribution function implied by two-year zero-coupon inflation options. These risk-neutral probabilities may differ significantly from physical, or true, probabilities. They are estimated on the basis of call ("caplets") and put options ("floorlets") with different strike rates on the (three-month lagged) euro area HICPxT (ex tobacco) index, assuming Black-Scholes option pricing and implied volatilities that vary across strike rates ("volatility smile").

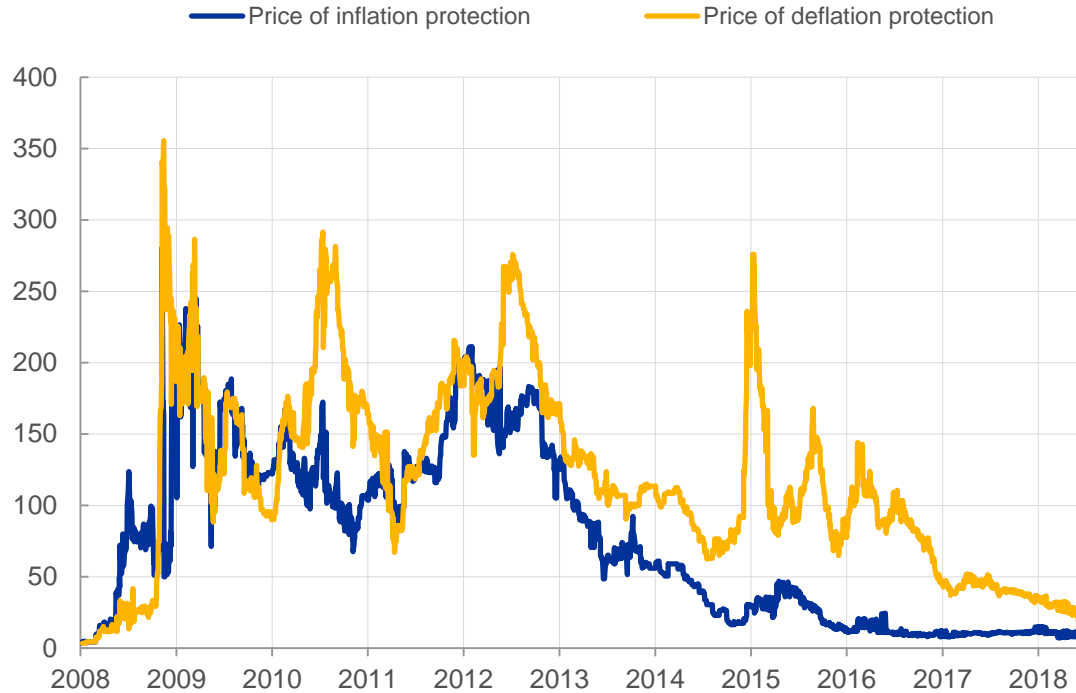
## Survey-implied probability density function of euro area inflation in two years time



Source: ECB Survey of Professional Forecasters.



## Price of inflation and deflation protection (basis points per annum)



Source: Bloomberg.

Note: The price of inflation (deflation) protection refers to the price of a year-on-year inflation option with a 4% cap (0% floor) for a horizon of five years.

Latest observation: 1 June 2018.

Monetary policy stance determined by combination & interaction of:

- our **policy rates**,
- our **asset purchase programme**,
- and our **forward guidance** on each of these tools

... complemented by:

- the **TLTROs**, which will remain outstanding for the next three years

## The ECB's forward guidance

### Key ECB interest rates

- expected to remain at present levels for an extended period of time
- and well past horizon of **net asset purchases**

### Asset Purchase Programme (APP)

- **net asset purchases** intended to continue at monthly pace of €30 billion, until end-Sep 2018
- or beyond, if necessary & in any case until GovC sees sustained adjustment in path of inflation (SAPI) consistent with inflation aim
- Eurosystem will reinvest principal payments from maturing securities for an extended period of time after end of net purchases, and in any case for as long as necessary

## Criteria for sustained adjustment in the path of inflation (SAPI)

### Convergence

- Headline inflation on course to reach levels below, but close to 2% in the medium term;

### Confidence

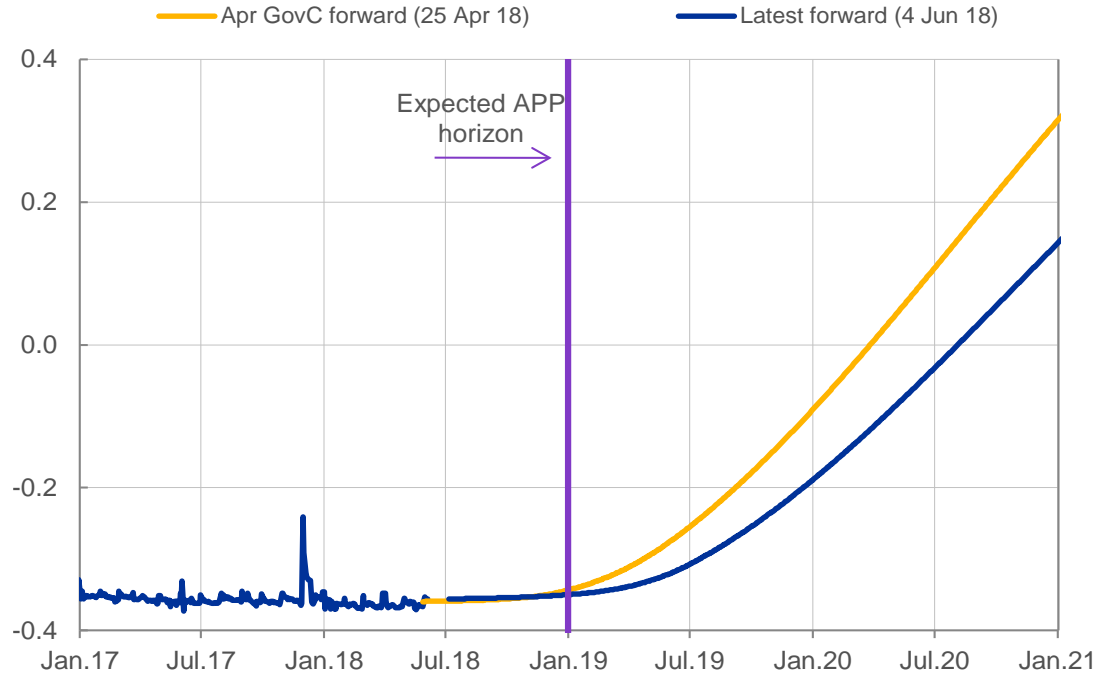
- Sufficient confidence in durable stabilisation of inflation around these levels;

### Resilience

- Resilience of inflation convergence even after the end of net asset purchases.

# EONIA forward curve estimated from OIS

(percentages per annum)



Sources: Thomson Reuters and ECB calculations.  
Latest observation: 4 June 2018 for realised EONIA, April 2018 for Bloomberg survey.