

#### **Box 4**

##### **Recent developments in the market for index-linked bonds in the euro area**

###### **The issuance of new index-linked bonds in 2003**

The year 2003 has seen significant growth in the market for index-linked bonds in the euro area, notably with the arrival of two new government issuers, Greece and Italy. Before March 2003 only France had issued bonds linked to the euro area HICP (excluding tobacco), covering two maturities (2012 and 2032) with an outstanding amount of around €16 billion. In March 2003 Greece issued an index-linked bond maturing in 2025 for an amount of €1.25 billion. More recently, in September 2003, Italy issued an index-linked bond maturing in 2008 for an amount of €7 billion.

The two new index-linked bonds share most of the technical characteristics of the existing French index-linked bonds. First, they are linked to the euro area HICP excluding tobacco. Second, as in the case of the French index-linked bonds, the Italian and Greek bonds have guaranteed redemption at par, implying that in the event of deflation during the life of the bond, the redemption amount will equal the face value.

### Characteristics of the euro area bonds linked to HICP excluding tobacco at end-September 2003

Issuer	Maturity	Issuance date	Coupon % p.a.	Amount outstanding EUR billion	Ratings Moody's/S&P/Fitch
Italy	Sep. 2008	Sep. 2003	1.65	7.00	Aa2/AA/AA
France	July 2012	Nov. 2001	3.00	11.00	Aaa/AAA/AAA
Greece	July 2025	Mar. 2003	2.90	1.25	A1/A+/A1
France	July 2032	Oct. 2002	3.15	5.00	Aaa/AAA/AAA

Sources: Agence France Trésor, Italian and Greek Treasuries.

However, two main differences exist between the bonds issued by the different countries. First, the tax regime differs across the countries. Second, the different bonds are not perceived by rating agencies to bear the same credit risk. As shown in the table above, the credit rating is the highest for France and the lowest for Greece.

#### Deriving measures of inflation expectations

The availability of these new bonds with different maturities makes it possible to construct a rudimentary euro area break-even inflation rate (BEIR) curve. Break-even inflation rates may not be biased strongly by differences in credit risk since they are calculated as the difference between the yields of comparable nominal and index-linked bonds which are both subject to the same credit risk premia for each country (for more details on break-even inflation rates see the box entitled “Deriving long-term euro area inflation expectations from index-linked bonds issued by the French Treasury” on page 16 of the February 2002 issue of the Monthly Bulletin). However, differences in tax regimes may bias the calculated break-even inflation rates across countries. This bias is difficult to measure, since the impact of differing tax regimes on the specific bond yields hinges on the tax rates applicable to individual investors, be they residents or non-residents. In addition, liquidity differences between the corresponding index-linked and nominal bonds may also hamper comparability of break-even inflation rates.

The term structure of break-even inflation rates calculated from the four bonds linked to the euro area HICP excluding tobacco is very similar to the “inflation expectations curve” extracted from inflation-linked zero-coupon swaps (more details on inflation-linked swaps can be found in the box entitled “Deriving euro area inflation expectations from inflation-linked swaps” on page 31 of the September 2003 issue of the Monthly Bulletin). The chart below shows the different measures of average inflation expectations over different horizons as of the end of November 2003. For break-even inflation rates, two different curves have been constructed. One reports the break-even inflation rates for each maturity date of the underlying index-linked bonds. This term structure, however, does not accurately measure average inflation expectations over different horizons. This is because the index-linked and nominal bonds used for the calculation of the break-even inflation rates are coupon-paying bonds, the maturity of which does not represent a good measure of how long, on average, the holder of the bonds has to wait before receiving cash payment. A better measure in this respect is the “duration” of a coupon-paying bond, which is lower than its maturity.<sup>1</sup> The chart below therefore also shows a curve that plots the break-even inflation rates against the duration of the corresponding nominal bond (the curve is therefore named “maturity-adjusted”). It can be seen that the maturity-adjusted BEIR curve is very close to the curve built from the inflation-linked zero-coupon swaps.

In interpreting the chart, it is important to recall a number of caveats about why break-even inflation rates may not correspond to average inflation expectations. First, a difference may be due in part to an inflation uncertainty risk premium required by investors to hold long-maturity nominal bonds. This first premium

<sup>1</sup> The duration of a bond is its maturity adjusted for payments on the bond that are made early (e.g. interest and/or amortisation of the principal). The duration is also an expression of the sensitivity of the net present value of a bond to a change in its discount rate.

implies that the break-even inflation rate is biased upwards. It is natural to expect this inflation risk premium to rise with the maturity of the bond. Second, a liquidity premium can work in the opposite direction since the liquidity of the index-linked bond is typically lower than that of the corresponding nominal bond. Third, break-even inflation rates refer to the HICP excluding tobacco. The average inflation rate of the HICP including tobacco has on average, over recent years, been slightly higher than the HICP excluding tobacco, implying a negative bias in the break-even inflation rates. Fourth, break-even inflation rates may be sometimes subject to technical factors.

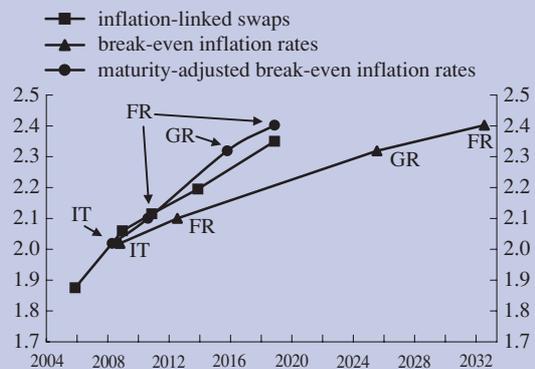
As seen in Chart 23, the break-even inflation rate in the euro area rose quite strongly in recent months. According to some anecdotal evidence, increasing demand for index-linked bonds from different types of investors, for example insurance companies and pension funds, may have pushed the prices of index-linked bonds up and their real yields down. This factor may, in particular, have generated upward bias in the long end of the break-even inflation rate curve. The announcement by the German authorities that they would not be issuing index-linked bonds in 2004 was in contrast to some market participants' expectations and could have created a kind of "scarcity premium" in the prices of the existing index-linked bonds, adding upward pressure on break-even inflation rates.

Although these special factors could potentially explain a significant part of the current relatively high levels of euro area break-even inflation rates, it cannot be ruled out that more fundamental factors have played a role. For example, over recent months there has been a considerable amount of positive news on economic activity in the euro area, while there has also been some very disappointing news in the area of fiscal policy. Neither can it be ruled out, at this stage, that these two factors have also had an impact on inflation uncertainty and even on average inflation expectations in the euro area. It is therefore important to monitor developments in these markets carefully and to compare them with other measures of inflation expectations such as those derived from surveys, which have remained broadly unchanged over recent months.<sup>2</sup>

<sup>2</sup> See also the box entitled "Forecasts by other institutions" on page 60 of this issue of the Monthly Bulletin.

### Inflation expectation curves extracted from the euro area index-linked bond markets and the inflation-linked swaps market

(as at the duration/maturity of each bond)



Sources: Agence France Trésor, Italian and Greek treasuries, and CDC-IXIS capital markets.