Indexed bonds and inflation expectations in the euro area[1]

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Introduction

In recent years, the issuance of inflation-indexed bonds has grown strongly in the main debt markets. The fundamental characteristic of these bonds is that their yield is protected against inflation, since their holders are compensated in both coupon payments and in the repayment of principal (upon maturity) for the loss of purchasing power attributable to actual inflation.

Although the origin of indexed debt and its theoretical rationale go back more than two hundred years,[2] the essential development of this market is very recent and has coincided with a setting of historically relatively low inflation rates in most of the industrialised countries. This is surprising when considered from the investor's standpoint, since the main characteristic of these instruments is that they protect the yield on the investment against inflation. From the viewpoint of the issuer, however, the current setting is clearly more favourable.

One of the channels through which monetary policy may have a bearing on price developments is through its effect on long-term inflation expectations. If economic agents give credibility to the capacity and commitment of the central bank to maintain price stability, price and wage setting mechanisms will contribute to the attainment of the inflation target. Hence the importance of long-term inflation expectations remaining firmly anchored, and the need to monitor their developments very closely.

The purpose of this article is twofold. First, it describes the evolution of the indexed debt market in the euro area and its main characteristics; and, second, it analyses the possibilities offered by these instruments for measuring changes in long-term inflation expectations. In particular, a detailed analysis of the break-even inflation rate (BEIR), which is estimated using the yield on inflation-linked bonds, is presented. Currently, the bulletins of the most important central banks, as well as a large number of international public institutions and many financial institutions, comment regularly on these movements. This article may, therefore, be considered a practical guide to the interpretation of such information.

To this end, the second section presents an overview of the main indexed-debt markets and discusses, in particular, the development of the indexed-bond market in the euro area. Thereafter, the use of these instruments in the construction of inflation expectations indicators is analysed, with an explanation of the various possibilities that they offer, as well as their advantages and disadvantages. Finally, some brief conclusions are drawn.

Inflation-indexed debt in perspective

From a historical perspective, the issuance of indexed bonds has had three objectives. First, countries with high and variable inflation rates have found that indexed bonds are their best (if not their only) financing option. This group includes, notably, Chile in 1956, Brazil in 1964, Colombia in 1967 and Argentina in 1973. France, Finland, Israel and Iceland also issued indexed bonds occasionally in the period immediately after the Second World War.

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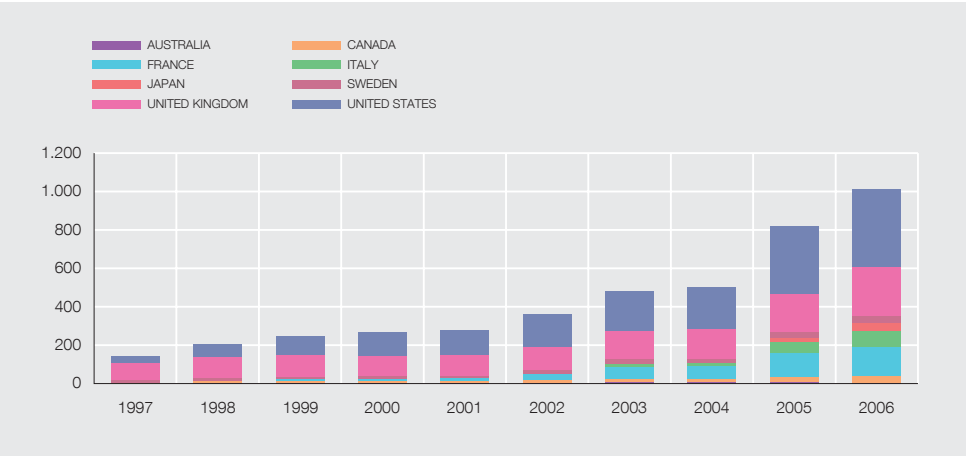
1. This article takes as reference the work of García and Van Rixtel (2007). Adrian Van Rixtel works in the Associate Directorate General International Affairs. **2.** A bond whose principal and interest were linked to the price of a basket of goods was issued by the State of Massachusetts in 1790 and the theoretical rationale for paying interest in real terms was developed in the 19th century [see Shiller (2003)].

AMOUNT OF OUTSTANDING INFLATION-INDEXED DEBT IN THE MAJOR INTERNATIONAL MARKETS (a) CHART 1



SOURCE: Barclays Capital.

a. Year-end data.

A second group of countries (the United Kingdom in 1981, Australia in 1985, Sweden in 1994 and New Zealand in 1995) decided to issue inflation-indexed debt in the 1980s and early 1990s as part of an economic policy strategy orientated towards a process of disinflation. In this setting, the issuance of indexed debt sought to give credibility to the commitment of governments to controlling inflation and to reduce the cost of public debt linked to high inflation expectations and/or an excessive risk premium in the markets.

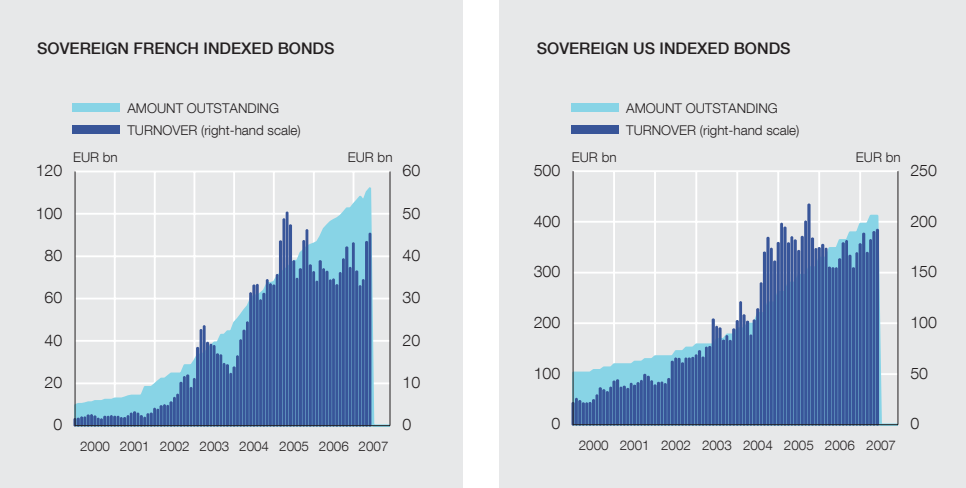
More recently, a third group of industrialised countries (Canada in 1991, United States in 1997, France in 1998, Greece and Italy in 2003, Japan in 2004 and Germany in 2006) has chosen to issue indexed debt in a period of low (actual and expected) inflation. In these cases, the fundamental motivation is related to social welfare arguments, like broadening the range of assets available in the financial markets or meeting the need for efficient protection against long-term inflation risks in public and private pension schemes, given the population ageing in many of these countries. Other countries have continued (United Kingdom) or resumed (Australia) their issuance of indexed debt on the basis of similar arguments. Indexed bonds still represent a small percentage of total outstanding debt, but they play an important role in public-debt issuance strategy in a growing number of countries [see De Cecco et al. (1997) and Favero et al. (2000)].

Currently, Australia, Canada, Sweden, the United Kingdom, the United States, Japan and a group of European countries (France, Italy, Greece and Germany) are the main issuers of sovereign indexed bonds (see Chart 1). One important characteristic of the growth of inflation-indexed bond markets is the acceleration since 2004, in volumes of issuance and, especially, turnover (see Chart 2).

The euro area inflation-indexed bond market is one of the most recent to be set up. In a short space of time it has become second only to the US market in terms of the amount of debt outstanding and turnover.

The French Treasury issued the first bond with coupon payments indexed to euro area inflation in October 2001, with maturity July 2012 (OATei 2012), only a few years after issuing bonds indexed to the general French price index (excluding tobacco) (OATis), in 1998. Al-

AMOUNT OUTSTANDING AND TURNOVER (a) CHART 2



SOURCE: BNP Paribas.

a. Monthly turnover in terms of three-month moving averages.

though the price index on which the European Central Bank's quantitative definition of price stability is based is the overall HICP, the euro area HICP (excluding tobacco) was chosen as the reference for calculating the protection against actual inflation in order to comply with French regulations on indexation, which prohibit the inclusion of tobacco in the reference index. The euro area HICP (excluding tobacco) has since become the benchmark reference in the market for indexed bonds and related products, such as swaps and inflation futures.

So far, the countries that have issued debt indexed to euro area inflation, along with France, are Greece, Italy and Germany.[3] The indexed bonds of these countries share some of the basic characteristics of French indexed bonds: indexing to the HICP (excluding tobacco); protection in the case of deflation by guaranteeing redemption at par; and the same mechanism for calculating the daily indexation indices.[4] However, the Italian and Greek bonds do not have the same credit rating as the French and German ones. In addition, the payment frequency of Italian indexed bonds is semi-annual, rather than annual, as for the other bonds. Table 1 provides a list of the indexed bonds existing in the euro area.[5] The increase in the number of issuers and bonds issued has made a decisive contribution to enhancing market liquidity, as reflected in the greater volume of trading in recent years (see Chart 2).

The use of indexed bonds for the analysis of market inflation expectations

Over the years, many economists have proposed using indexed bonds to measure the real interest rate and the inflation expectations of financial agents [see Campbell and Shiller (1996)]. The presence of these bonds in the market increases the possibilities for decomposing nominal interest rates into the expected real interest, expected future inflation and the risk premium.

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3. Finland in the early 1990s, Greece in 1997, Austria in 2003 and Belgium in 2004 also issued indexed debt, but only sporadically. Other EU countries, such as the Czech Republic and Hungary, also did so in the period 1996-1997, and Poland in 2004. **4.** The official inflation statistics are published monthly, but refer to the previous month. As it is necessary to know them in order to adjust the indexed bond coupon payments, the compensation is based on actual inflation up to three months prior to the payment. The daily price level values used to value indexed bonds in real time are based on official rules for interpolating between the monthly values. These rules and other basic characteristics of French bonds indexed to euro area inflation (OATeis) can be found at http://www.aft.gouv.fr/article_774.html?rech=1. **5.** Detailed information on the euro area indexed bond market can be found in the report of the Euro Debt Market Association [AMTE (2005)]. For a detailed overview of other markets, see, for example, Deacon et al (2004).

BONDS INDEXED TO THE HICP (EXCLUDING TOBACCO) IN THE EURO AREA TABLE 1

ISSUER	MATURITY DATE	ISSUANCE DATE	Amount outstanding (EUR billions)	Rating (S&P)
Italy	Sep. 2008	Sep. 2003	13.40	A+
France	Jul. 2010	Apr. 2006	5.75	AAA
Italy	Sep. 2010	Sep. 2004	14.30	A+
France	Jul. 2012	Nov. 2001	14.50	AAA
Italy	Sep. 2014	Feb. 2004	14.50	A+
France	Jul. 2015	Nov. 2004	10.00	AAA
Germany	Apr. 2016	Mar. 2006	9.00	AAA
Italy	Sep. 2017	Oct. 2006	7.45	A+
France	Jul. 2020	Jan. 2004	11.00	AAA
Greece	Jul. 2025	Mar. 2003	7.20	A (FIT)
France	Jul. 2032	Oct. 2002	8.75	AAA
Italy	Sep. 2035	Oct. 2004	10.30	A+
Italy	Sep. 2057	Feb. 2007	N.A.	N.A.

This section describes how to use indexed bonds to extract that information in the euro area.[6] As a comparison, certain references to other markets are included, principally the US market for indexed bonds (Treasury Inflation-Indexed Securities, TIIS, also known popularly as Treasury Inflation-Protected Securities, TIPS).

BREAK-EVEN INFLATION RATES AS INDICATORS OF INFLATION EXPECTATIONS

Inflation expectations indicators are fundamental for economic policy, and indexed bonds are an important instrument for measuring such expectations. In particular, the inflation compensation estimated on the basis of indexed bonds in the euro area, commonly known as the break-even inflation rate (BEIR), is calculated as the difference between the yield on a nominal bond and on a bond indexed to the HICP (excluding tobacco), with the same characteristics as regards issuer and maturity. The theoretical rationale for this calculation is the Fisher equation, which establishes that the nominal yield on a bond is approximately equal to the sum of the required real rate and the expected average inflation rate during the residual maturity.

BEIRs have two main advantages as a source of information for inflation expectations. First, since indexed bonds are continuously traded on the market, they are available at high frequency. Second, since both nominal and indexed bonds are issued with various maturities, inflation expectations can be calculated for different periods, which is fundamental both for central banks and for private investors.

However, some caution is necessary in the interpretation of these indicators as measures of inflation expectations, owing, first, to the presence of the risk premium. If investors were risk neutral, they would require the same expected return on both types of bond, and the compensation for future inflation would be (approximately) equal to the average expected inflation until the maturity of the bonds.[7] However, investors are generally risk averse. As future inflation will depreciate the payments received on a nominal bond, but not those on an indexed bond, it is

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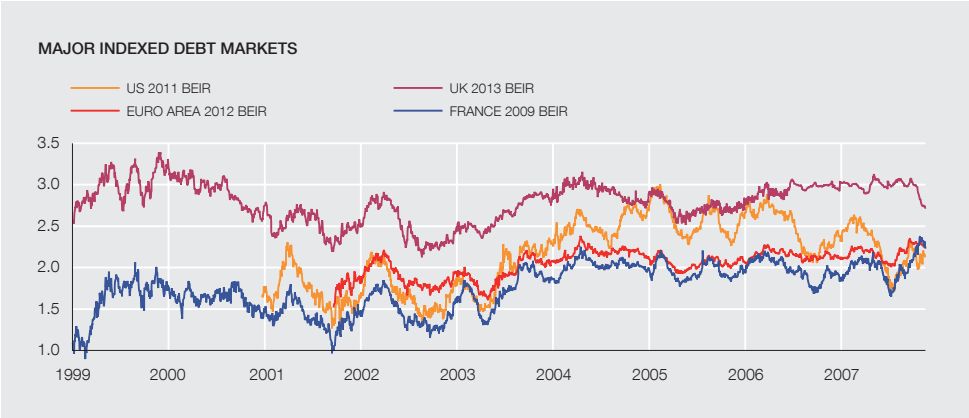
6. Breedon and Chadha (1997) analyse the properties of BEIRs as leading indicators of inflation for the United Kingdom and Chistensen et al. (2004) for Canada; Sack (2003) investigates their use to predict interest rate movements. **7.** Even ignoring the risk premium, it should be taken into account that the yield differential is a linear approximation of the Fisher equation, based on nominal rates, and that it differs from the calculation based on equivalent annual rates of return by a few basis points. For example, with a nominal rate of 4% and a real one of 2%, the Fisher equation would indicate a BEIR of 1.96%, in comparison with a simple differential of 2%.

LONG-TERM BEIR (a) CHART 3



SOURCES: Reuters and author's calculations.

a. BEIRs calculated as the yield spread between a nominal bond and an indexed bond with the same maturity.

natural to think that, in the case of nominal bonds, investors require additional compensation for the uncertainty associated with expected inflation. Therefore, the total compensation for inflation required by investors will not only reflect the average expected inflation rate, but also additional compensation in the form of a risk premium for the uncertainty associated with that future inflation.

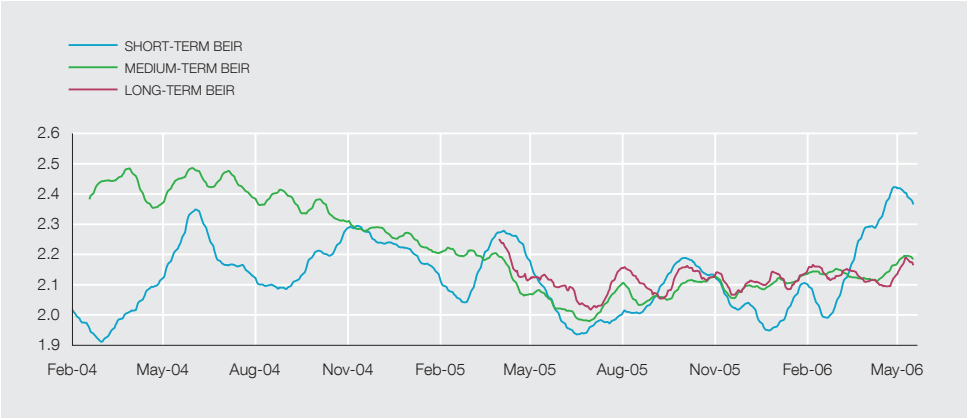
A second problem arises from the fact that indexed bonds are normally less liquid than conventional bonds. The presence of a liquidity premium in indexed-bond yields means that BEIRs underestimate inflation expectations. For example, the presence of a considerable liquidity premium in the US indexed bond market is the most plausible explanation for the difference observed until the year 2003-2004 between financial indicators and inflation expectations arising from surveys [see Sack and Elsasser (2004)]. As discussed in the previous section, the turnover of indexed bonds is currently much higher, and it is very likely that the liquidity premium has declined significantly.

Third, BEIRs are biased slightly downwards relative to inflation measured by the overall HICP, since the reference price index used in the euro area for all the indexed bonds issued until now is the HICP excluding tobacco, and in recent years its growth rate has been slightly below that of the overall HICP. As regards their use in central banks, it has also been argued that, while these bonds are usually indexed to general price indices, monetary policy analysis may be founded (although this is not the case of the ECB) on indicators based on measures of core inflation [see Bernanke (2004)].

Finally, movements in these indicators may occasionally be influenced by technical or institutional factors, such as tax distortions or regulatory changes, which may affect the demand for indexed bonds and reduce the information content of BEIRs. Such distortions are often difficult to identify and even more difficult to quantify, but a comparison of the movements in other similar markets may be useful to detect specific distortions [see Chart 3 and, for example, Scholtes (2002) for the United Kingdom].

In short, the interpretation of BEIRs requires that a number of considerations be taken into account. First, the yield spreads between nominal and indexed bonds should be interpreted as a measure of the total inflation compensation required in the markets, and not as a "simple"

IMPLIED BEIRs AT DIFFERENT TIME HORIZONS (a) (b) CHART 4



SOURCES: Reuters and author's calculations.

a. Daily data. Five-day moving averages.
b. Short-term BEIRs calculated on the basis of the indexed bond with maturity 2008. Implied medium and long-term BEIRs calculated on the basis of indexed bonds with maturity in 2008 and in 2014, and 2012 and 2015, respectively.

inflation rate that equalises the yield on assets (to break even). This compensation for inflation provides information on the expected level of inflation and also on the level of risk associated with that level of inflation (in the form of a risk premium). Accordingly, changes in BEIRs may reflect changes in the expected level of inflation, changes in the inflation risks perceived by economic agents, or else a combination of both. From the central bank's viewpoint, both components are relevant: a credible commitment to maintaining price stability should anchor the expected inflation rate at values consistent with the monetary policy target, while the degree of uncertainty associated with the long-term inflation expectations provides a measure of the firmness of this anchoring. Changes in the inflation compensation required by investors in the bond market provide central banks, and economic agents in general, with information on inflation expectations and their associated risks that it is difficult to obtain by any other means.

A breakdown of BEIRs into inflation expectations and the associated risk premium requires a model of the time structure of nominal rates. Given the complexity involved in formulating and estimating such models, recent research usually incorporates indexed-bond yields as additional information. For the euro area, such estimates are still scant, but the evidence available suggests that, in the long term, inflation expectations are the main component of the level of BEIRs. The long-term risk premium in the euro area is relatively low (on average, of the order of 25 basis points). However, variation in this premium is the main determinant of changes in BEIRs at short horizons [see García and Werner (2008)].[8]

MONITORING MOVEMENTS IN BREAK-EVEN INFLATION RATES

The greatest advantage of BEIR's as indicators of inflation expectations is their immediate availability. Although the sample is still relatively short and the European indexed debt market has only gradually developed, these indicators have in recent years provided sufficient evidence of their usefulness for the conduct of monetary policy, especially since 2004, when indexed bond turnover in the major markets seems to have reached sufficient levels.

8. The risk premium explains 90% of the variation in BEIRs in the long term. As regards the inflation risk premium in US Treasury bonds, recent estimates indicate large fluctuations over the last few decades, between the levels of 20 and 140 basis points [see Ang et al. (2008) and Buraschi and Jiltsov (2005)]. Kim and Wright (2005) argue that the inflation risk premium gradually decreased from 1990, to reach 50 basis points by mid-2005.

Spot BEIRs provide information on the average inflation expected during the period to maturity of the bonds. For example, disregarding the risk premium, the BEIRs calculated on the basis of the OATei 2012 bond reflect the expected average inflation until that date.

Chart 3 shows the BEIRs for the euro area, United States, United Kingdom and France, calculated on the basis of indexed bonds issued with a maturity of ten years. In all these markets, BEIR's have experienced significant volatility in recent years, but the similarities between the behaviour of these indicators in the four markets indicate that inflation rates have been influenced by global factors. For example, since mid-2003, coinciding with the strong growth in the prices of oil and other commodities, there was an upward trend in all four markets.

The observed spreads in Chart 3 are consistent with the differences between the long-term inflation targets of the monetary authorities of the three economic areas. The case of the US economy seems rather extreme, however, since the BEIRs were abnormally low in the period 1997-2003, probably reflecting the lack of liquidity in the US indexed debt market, given its scant development at the time, while after that period they display levels much more consistent with other indicators of long-term inflation expectations.[9]

Spot BEIRs, by reflecting the average inflation compensation demanded by investors until the maturity date of the bonds, may be strongly influenced by short-term inflation expectations owing to temporary inflationary pressures beyond the control of the monetary authorities. For this reason, it is normal practice in the official publications of central banks to present (implied) forward BEIRs that provide information on medium and long-term inflation expectations. For example, in the case of the euro area, this calculation may be based on bonds with maturity in 2012 and 2015 issued by the French Treasury. The implied 2012-2015 BEIR would reflect average inflation expectations (and associated risks) between 2012 and 2015, and would therefore be free from the influence of short-term inflation movements. By combining spot and implied BEIRs, one can easily construct indicators that reflect, at a given time, short, medium and long-term inflation expectations (see Chart 4). However, the spot and implied BEIRs calculated using market-traded bonds have the disadvantage that the time horizon of the inflation expectations which they reflect shortens as the maturity of the bonds used approaches. This is a significant problem when the objective is to analyse movements over a relatively long period of time.

To avoid these problems in the monitoring of medium and long-term inflation expectations, the normal practice is to estimate the zero-coupon BEIR as the spread between the estimated yields on nominal and real zero-coupon bonds [see Ejsing et al (2007)].[10] These estimates enable nominal and real yields to be obtained at any term and, therefore, enable inflation expectations to be monitored for any time horizon, not only those for which there is an issued bond. Although the lack of a sufficient number of indexed bonds with short maturities in the euro area market makes it less advisable to use such measures for time horizons of less than three

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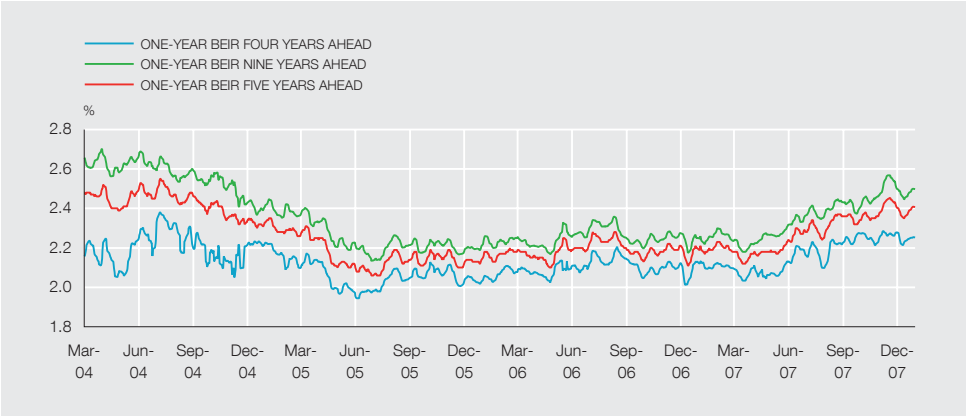
9. This interpretation is consistent with the assessment of the Federal Reserve itself which, despite the significant increase in BEIRs during 2004, described long-term inflation expectations as well contained in various official statements by its Open Market Committee. **10.** Estimating the term structure of the BEIR in the euro area has a number of complications, such as for example the small number of indexed bonds, especially in the short term, as well as the presence of various different issuers. Ejsing et al. (2007) apply the method of Nelson and Seigel (1987), a parametric approach common at central banks [see BIS (2005)]. The yield spreads between nominal and real zero-coupon bonds avoid the distortions arising from differences in the duration of indexed and nominal bonds with the same maturity. This article confirms that, at least in recent years, these differences are small and the BEIRs based on observed yields are a good approximation. However, the seasonality of inflation gives rise to large fluctuations in these measures, so that it is advisable to adjust the yield curves for this seasonality in order to obtain better measures of inflation expectations at different time horizons.

BEIRs AT DIFFERENT HORIZONS (a) (b) CHART 5



SOURCES: Reuters and author's calculations.

a. Daily data. Five-day moving averages.
b. Seasonally-adjusted forward BEIRs calculated following Ejsing, García and Werner (2007).

years, for longer periods zero-coupon BEIRs provide reliable and more precise measures of implied inflation expectations.

The European Central bank, in line with other important central banks, regularly provides detailed information in its Monthly Bulletin on the movements in long-term inflation expectations by decomposing ten-year BEIRs (an indicator of the average inflation compensation required by markets for the next ten years) five-year BEIRs and the implied BEIRs for between five and ten years, which offer more precise information on the inflation rate (and associated risk premium) expected on average in the medium and long-term (see Chart 5).

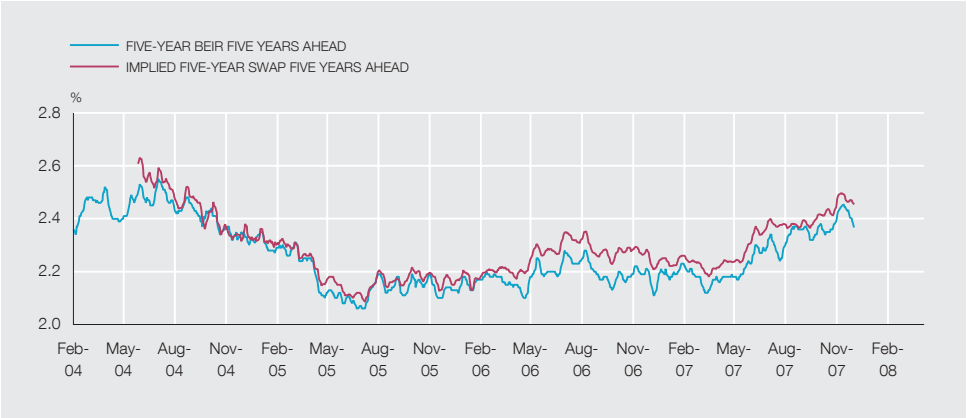
The estimation of zero-coupon term structures also enables the movements in the implied BEIRs for between five and ten years to be interpreted by means of measures separately reflecting inflation expectations in the medium and long term. To this end, the calculation of implied one-year BEIRs four and nine years ahead may often be useful. Chart 5, for example, confirms the conclusion of Chart 4 as regards the sharp decline in medium and long-term inflation expectations in the euro area between 2004 and early 2005, and their relative stability thereafter until the first half of 2007, despite the rises in short-term BEIRs and in actual inflation.

BREAK-EVEN INFLATION RATES AND OTHER INDICATORS OF LONG-TERM INFLATION EXPECTATIONS

Apart from the BEIRs calculated on the basis of indexed bonds, there are two further sources of information on long-term inflation expectations in the euro area: inflation swaps and surveys of macroeconomic expectations. Comparison of the developments in these three indicators is often very useful, since it provides information from different markets and economic agents and enables more robust conclusions to be obtained on movements in inflation expectations.

Inflation swaps are contracts involving the exchange of two capital flows, one of which will depend on actual inflation during the life of the swap, while the other is a fixed rate agreed between the parties. In a similar way to BEIRs, the inflation compensation is the rate that would ex ante equalise the nominal flows exchanged. Inflation swaps offer a broad range of maturities so that, as in the case of BEIRs, a curve of inflation compensation and contract terms can be obtained and the most important values selected. However, in order to compare these two indicators it is important to take into account two differences between them. First, swaps are contracts relating to annual periods of one or more years, and therefore the inflation compensation they incorporate is free from the seasonality of monthly inflation. For compari-

BEIR AND INFLATION SWAPS CHART 6



SOURCES: European Central Bank, Reuters and author's calculations.

son to be useful, therefore, it is necessary to adjust the BEIRs for the effect of inflation seasonality [see Ejsing et al. (2007)]. Second, besides the inflation risk premium that they have in common with BEIRs, inflation swaps may incorporate a premium to compensate for counterparty risk.

As can be seen in Chart 6, these two alternative measures of compensation for long-term inflation have followed a very similar trajectory for the euro area, which contributes to the robustness of the conclusions drawn from their interpretation. In fact, the discrepancies between them are useful to identify occasional distortions in the indexed bond market. For example, in the first few months of 2008, the strong demand for (highly rated) sovereign short and medium-term bonds gave rise to large fluctuations in the spot BEIR five years ahead and in the implied long-term BEIRs, which exceeded swaps by a wide margin (see also Box 3 of the "Quarterly report on the Spanish economy" in the April 2008 edition of this Bulletin).

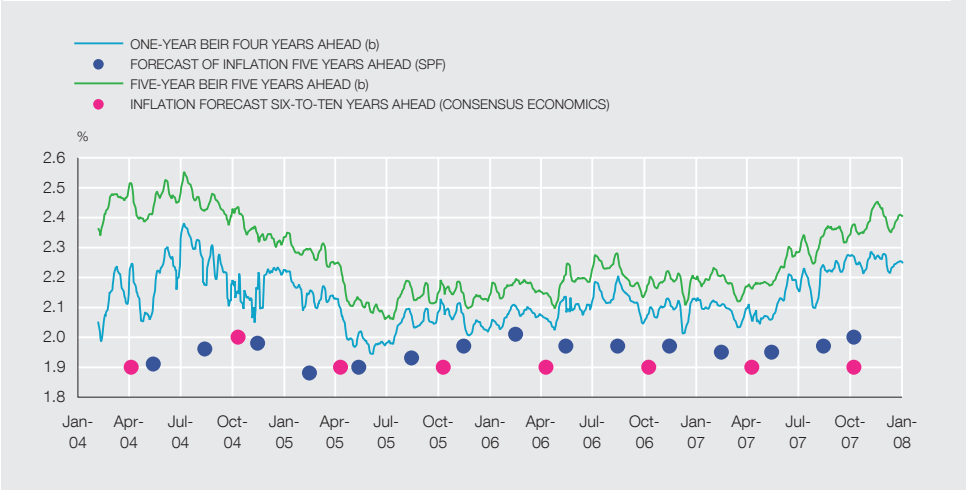
The decomposition of BEIRs into inflation expectations and the associated risk premium is rather complex and the results often depend on the model chosen. The comparison of long-term inflation expectations based on financial indicators with those based on surveys of inflation expectations is a simple (but intuitive) way of obtaining information on the relative size of the two components of BEIRs.

For the euro area, two of the most important surveys of inflation expectations are Consensus Economics, which publishes, on a half-yearly basis, inflation expectations for 6-10 years, and the European Central Bank Survey of Professional Forecasters (SPF), which provides 5-year inflation expectations on a quarterly basis.[11] In principle, BEIRs and surveys of inflation expectations reflect the opinion of different economic agents (investors and professional economists, respectively) and are available with different frequencies, but these differences do not imply that it is of no interest to compare them, at least for the long term.

Chart 7 illustrates the two main differences between BEIRs and inflation expectations obtained from surveys. First, financial indicators display larger fluctuations than the survey data. Sec-

11. For a detailed description of the ECB Survey of Professional Forecasters (SPF), see García (2003). The Euro Zone Barometer survey also includes long-term inflation expectations for the euro area, with monthly periodicity.

INDICATORS OF EURO AREA LONG-TERM INFLATION EXPECTATIONS (a) CHART 7



SOURCES: Reuters, Consensus Economics and author's calculations.

a. Zero-coupon BEIRs calculated as the difference between zero-coupon curves for nominal and real yields estimated following Ejsing, García and Werner (2007). The average long-term inflation expectations of the SPF, estimated following García and Manzanares (2007).
b. Seasonally adjusted inflation series.

ond, BEIRs usually fluctuate at above the level of the long-term inflation expectations reflected in surveys, which supports the hypothesis of the existence of an inflation risk premium in the return on the nominal bonds used for this calculation.

As indicators of long-term inflation expectations (and associated risks), BEIRs enable changes to be detected in these expectations as soon as they occur. For example, unlike the upward movement in BEIRs in 2004 Q2, against a background of strong oil price rises, the long-term inflation expectations reflected in the April surveys that year showed hardly any change with respect to the previous quarter. The surveys were not conducted again until several months later (the SPF in mid-July and Consensus Economics in October), when inflationary pressures had already subsided, as the decline in both the spot and implied BEIRs suggests.

Conclusions

In recent years, the issuance of inflation-indexed bonds has grown sharply in the main debt markets. This phenomenon has entailed a significant contribution to financial market expansion and development, since it provides new possibilities for enhancing the efficiency of financial services in developed economies. A detailed (but accessible) discussion of these advantages may be found in García and Van Rixtel (2007).

The inflation-indexed debt market of the euro area is one of the most recently created ones. Yet four countries (France, Greece, Italy and Germany) have already issued bonds indexed to the HICP (excluding tobacco) of the euro area. Taken together, these issues currently represent the second largest sovereign indexed bond market in terms of the outstanding amount of debt and turnover, only the US market being larger.

This article has focused on the possibilities offered by indexed bonds for analysing inflation. BEIRs, usually calculated as the yield spread between a conventional and an indexed bond with the same issuer and maturity, have important advantages as a source of information for inflation expectations, as they can be calculated continuously and for different periods. However, some caution is necessary in the interpretation of these indicators. It is important to taken into account that BEIRs reflect the total compensation for inflation, i.e. expected inflation

plus a risk premium. In addition, like any financial instrument, they may sometimes be affected by technical factors (liquidity, changes in regulations, etc.), which are often difficult to identify and even more difficult to quantify. Accordingly, it is very important to analyse these measures of inflation compensation in combination with survey-based inflation expectations indicators.

14.05.2008.

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