

Box 1.4: What do survey data tell us about future price developments?

Inflation today is low by historical standards in most advanced economies. Survey-based data on price expectations provide timely information on current developments but can also signal future developments. As expectations that prices will fall in the future could lower current inflation, e.g. by encouraging consumers to delay purchases until prices fall, it is important to carefully monitor various measures of price expectations.

Against this background, this box explores the usefulness of qualitative survey data for monitoring price developments in the EU and the euro area and investigates whether inflation, after years of decline, has bottomed out or started to recover. Two main sets of survey data are analysed: the first consists in data that can detect price pressure at an early stage of price formation, such as managers' selling price expectations. The second set includes data on consumer price expectations, which could reveal whether the recent decline in consumer-price inflation (as measured by the HICP) has had an impact on inflation expectations.

Price pressures along the supply chain

Producer prices are of particular interest since they can help to identify price pressures at an early stage of the value chain that could subsequently be passed on to finished goods and hence consumers.

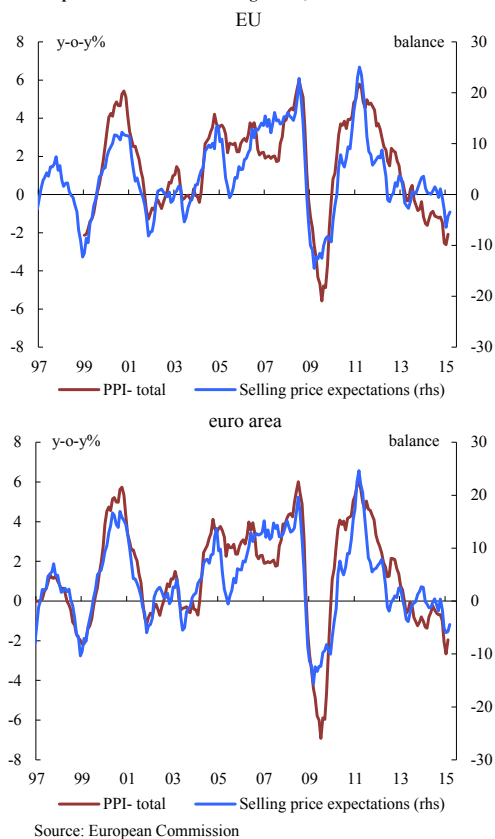
Two sorts of data are used to check the information contained in survey data with regard to future producer price developments: the business surveys conducted by the European Commission in the framework of the Harmonised Business and Consumer surveys (BCS) and Markit Economics' PMI.

Question 6 of the European Commission's monthly Industry Survey ⁽¹⁾ reads: 'How do you expect your selling prices to change over the next three months? They will increase, remain unchanged or decrease'. As the question relates to manufacturing, the assessment is made against the Producer Price Index for the manufacturing sector, which represents 84% of 'total industry excluding construction' in both the EU and the euro area.

Graph 1 demonstrates the close co-movement of selling price expectations and producer prices.

After a period of relative stabilisation in early 2014, both series were on a downward trend in November, following the oil price decreases registered since mid-2014, and picked up in February 2015. In March, selling price expectations increased further in both the EU and the euro area.

Graph 1: Selling price expectations (balance statistic) and producer prices in the manufacturing sector, EU and euro area

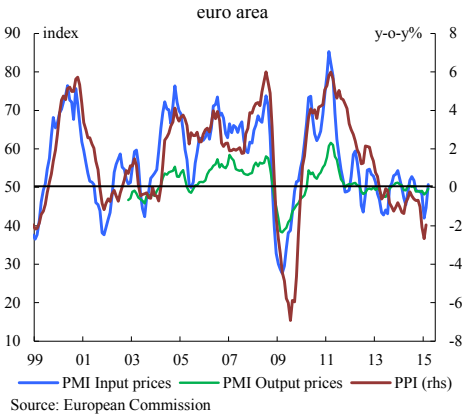
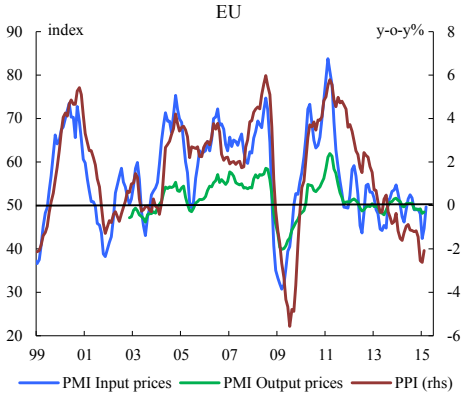


Source: European Commission

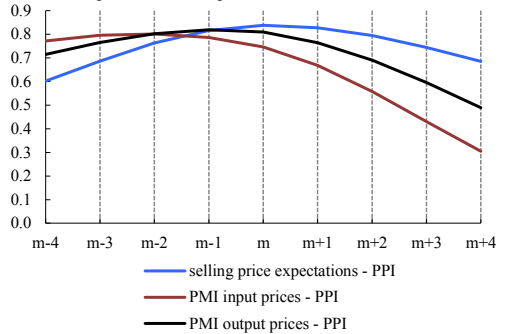
Markit Economics' PMI survey asks managers about their buying (input) prices and the prices they charge for their goods (output prices). Graph 2 shows PMI input and output prices along with year-on-year changes of producer prices, again testifying a close co-movement between the series. Focusing on the most recent developments, while PMI output prices have been fluctuating around a level of 50 between mid-2012 and mid-2014, which represents stable producer prices, they registered an important decline from November 2014 to January 2015. In line with the European Commission's survey results, PMI output prices picked up in February and March, rising above the threshold of 50 for the euro area, thus indicating easing deflationary pressure.

⁽¹⁾ For more information, see http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm.

Graph 2: PMI input, output prices and producer prices in the manufacturing sector, EU and euro area



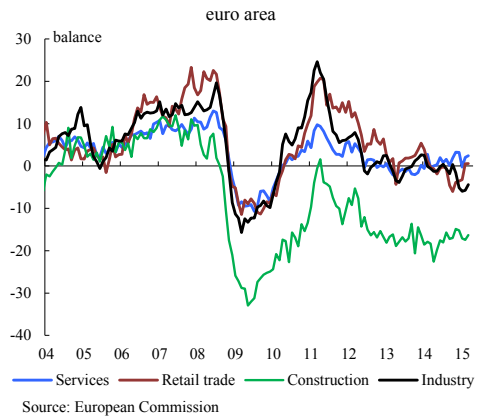
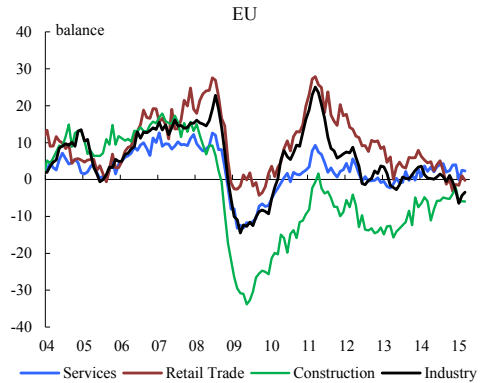
Graph 3: Correlation between y-o-y% of 'Manufacturing PPI' and EC 'Selling price expectations' and PMI input and output prices – over the period Nov 2002 to Feb 2015



Source: Markit Economics and European Commission.

Concerning recent developments, selling price expectations in the services sector have been se-sawing around a stabilising trend since the beginning of 2014.

Graph 4: Selling price expectations in the services, industry, retail trade and construction sectors, EU and euro area



Source: European Commission

The visual inspection is corroborated by correlation analysis, which indicates that selling price expectations and PMI input and output price developments track producer prices in the manufacturing sector quite closely (see Graph 3). Correlations with year-on-year producer price changes achieve their maximum in a coincident or slightly leading (1 month) set-up, suggesting some leading properties for survey-based measures of selling price expectations ('m' and 'm-1' on the horizontal axis of the graph). In line with the theoretical leading behaviour in the supply chain, the PMI series on input prices shows a higher degree of correlation with the PPI when considering lags from one to four months ('m-1' to 'm-4'). The question about selling price expectations also features in the European Commission's services, retail trade and construction surveys. As shown in Graph 4, the trend of these series, albeit at different levels, is rather similar to that observed in the manufacturing sector.

Expectations about prices charged in the EU construction sector have been on a volatile upward path since April 2013, while in the euro area the series has shown a rather flat development. Finally, selling price expectations in the retail trade sector — which are highly correlated with year-on-year

changes of the harmonised index of consumer prices (HICP) — have been on an upward trend since the end of 2014, mostly offsetting the decreases observable during the second half of 2014.

All in all, though manufacturing managers' selling price expectations and PMI input and output prices remain at relatively low levels, the latest increases suggest a bottoming out of price expectations. This is supported by the development of selling price expectations in the other business sectors that have either fluctuated around rather stable levels or seen slight upward revisions lately.

Inflation expectations

A second set of survey-based data is directly linked to consumer price developments.

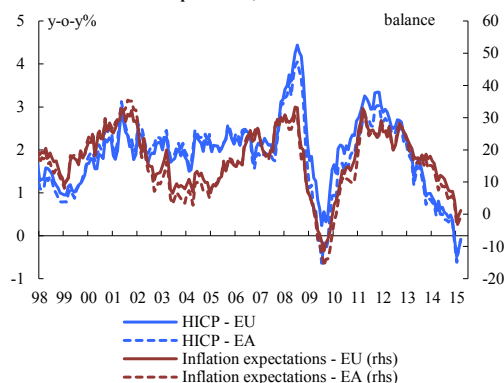
The European Commission's consumer survey is qualitative and covers short-term inflation expectations. The ECB's quantitative Survey of Professional Forecasters (SPF) focuses on both short- and long-term expectations. The target population of these two surveys differs (consumers vs. professional forecasters). A third measure of inflation expectations is based on financial market products.

As shown in Graph 5, prior to the introduction of euro notes and coins in January 2002, there was a close relationship between consumer inflation expectations and actual inflation developments, with a correlation above 0.9. The close co-movement between the two series was disturbed by the changeover, but became stronger again from the beginning of 2008.⁽²⁾ Since early 2014, inflation expectations have been declining again, in line with HICP inflation developments. Although euro area HICP inflation is at the same level as in 2009 (and at a lower level in the EU), the current level of inflation expectations is well above the historical low reached in 2009. In addition, the latest results show a slight increase in consumer inflation

⁽²⁾ In both the EU and the euro area the highest correlations between consumer price expectations and measured HICP is achieved in a coincident set up. For more information of the predictive power of inflation expectations, see Jonung, L. and Lindén, S. (2010), 'The forecasting horizon of inflationary expectations and perceptions in the EU Is it really 12 months?' *European Economy - Economic Paper No 435*.

expectations (in line with the pick-up registered in HICP inflation in February and March ⁽³⁾).

Graph 5: Actual HICP inflation and consumers' inflation expectations, EU and euro area



A disaggregate analysis of the evolution of inflation expectations over time also suggests that the present situation is different from the one observed in 2009, when a short period of negative inflation occurred in the euro area. Contrary to developments in 2009, the share of consumers expecting prices to fall has increased only marginally since 2011 and has remained very low (see Graph 6). This argues against additional deflationary pressures coming from consumers waiting for further price decreases. The only visible changes are an upward trend in the share of consumers expecting prices to remain broadly unchanged, and a decrease in the share of respondents expecting prices to increase more rapidly or at the same rate.

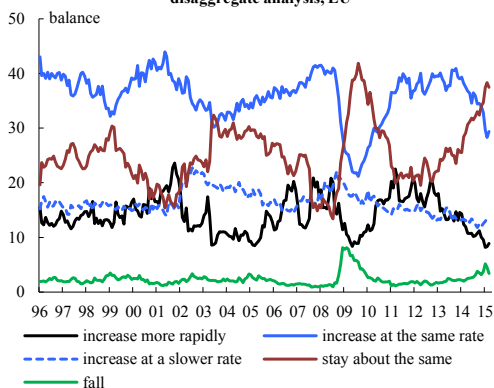
Overall, developments in consumer price expectations — at least for the short-term — do not point to a risk of 'self-fulfilling' dynamics which could eventually pull down inflation.

The quarterly ECB Survey of Professional Forecasters (SPF) collects information about forecasts for euro area HICP inflation one, two and five years ahead. In addition to the quantitative estimation of expected inflation, forecasters are asked to provide a probability distribution for

⁽³⁾ The HICP inflation rate in both the EU and the euro area increased to -0.1% in March from -0.3% in February.

expected inflation at both shorter and longer-term horizons.⁽⁴⁾

Graph 6: Consumers' inflation expectations, disaggregate analysis, EU



Standard measures of forecast performance, such as the root mean square error, show that SPF forecasts are more accurate than naïve forecasts based on inflation rates for the most recent past.

The latest SPF (2015Q2) indicates inflation expectations at 0.1 % for 2015, 1.2 % for 2016 and 1.6 % for 2017. Inflation forecasts were revised down for 2015, owing to oil price developments, but up for 2016 and 2017, supported by monetary policy measures and exchange rate developments. Compared with the previous SPF round, the aggregate probability distribution for expected inflation in 2015 moved further towards lower outcomes, while for 2016 and 2017, the probability associated with higher outcomes has increased. The most likely (modal) outcome lies in the 0.0-0.4 % range for 2015, in the 1.0-1.4 % range for 2016 and in the range of 1.5-1.9 % for 2017. According to survey participants, the probability of negative inflation in 2015 is now rather high (35 %), whilst for 2016 and 2017 it remains low (5 % and 2 %, respectively). Longer-term inflation expectations have remained unchanged at 1.8 % compared to the previous SPF survey. This confirms that longer-term inflation expectations of professional forecasters remain firmly anchored at levels consistent with the ECB's definition of price stability.

⁽⁴⁾ The panel comprises more than 70 forecasters located across the EU. Around 60 % of the SPF panel are participants from the financial sector (mainly banks), while the remainder are non-financial research institutes, employers' associations and labour organisations.

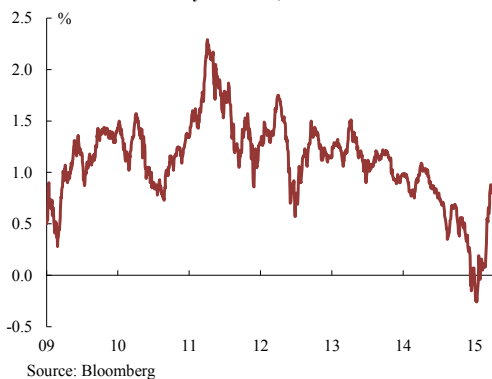
Market-based inflation expectations

Market-based inflation expectations have the advantage of providing information over a longer-term horizon; on the downside, they might be distorted by unobservable risk and liquidity premia.⁽⁵⁾

Market-based inflation expectations are most commonly analysed by break-even inflation rates and inflation-linked swap rates.

Break-even inflation rates — derived from German government bonds of maturity five years ahead — have overcome the lows recorded in early January (below zero) and currently stand at 0.85 % (see Graph 7). Having increased steadily since mid-February, they suggest that the decline of expectations was largely driven by temporary factors and that fears of deflationary pressure have reduced recently.

Graph 7: Inflation index-linked bonds maturity 5 years ahead, euro area



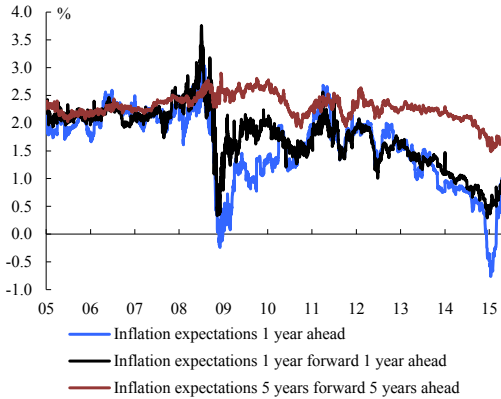
Source: Bloomberg

This trend is confirmed by the evolution of inflation-linked swaps for a wide range of maturities, from which a euro area inflation curve can be drawn. Market-based short-term inflation expectations have recovered from the troughs they reached in January (see Graph 8).

Long-term swap-based inflation expectations also bottomed out in January at historical lows and recovered slightly afterwards. Having fluctuated around its long-term average of 2.3 % for most of 2013, the 5-year forward five-years ahead implied rate declined in 2014. Currently it is hovering around 1.7 %, slightly lower than the ECB's SPF (2015Q1) results.

⁽⁵⁾ See 'Inflation risk premia in market-based measures of inflation expectations', *Monthly Bulletin* (ECB), July 2014.

Graph 8: Swap-based inflation expectations, euro area



Overall, market-based measures of inflation expectations bottomed out in January 2015 and have since recovered somewhat. Current very low swap-based inflation expectations can also be partly explained by the fall in inflation risk or liquidity premia. In any case, they indicate positive inflation rates later this year. Moreover, long-term inflation expectations point to increasing inflation rates over the coming years.

Conclusions

Survey data on managers' selling price expectations and consumers' inflation expectations

provide useful short-term information on the evolution of prices along the supply chain to final consumer prices.

Though clearer signs of long-lasting upward revisions have to be confirmed in the next months, the February and March results of the European Commission's manufacturing selling price expectations and Markit Economics' PMI input and output prices suggest that the downward trend has bottomed out and that there are signs of recovering prices along the supply chain. Signs of a break in the downward trend of producer prices are broad-based across business sectors, especially in retail trade, where selling price expectations have increased recently.

Concerning inflation expectations, the analysis shows that consumers do not seem to expect inflation to fall further. SPF results indicate that HICP inflation should remain positive, although low, in 2015. This is consistent with financial market-based measures of inflation expectations that point to positive inflation rates later this year. These results are in line with the Commission's spring forecast, which foresees low but gradually positive HICP inflation rates in the second half of 2015.