



# Anchoring of inflation expectations in the euro area: Recent evidence based on survey data<sup>☆</sup>



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## ABSTRACT

This article analyses the anchoring of inflation expectations of professional forecasters and consumers in the euro area. We study anchoring, defined as the central bank's ability to manage expectations, by paying special attention to the impact of the ECB inflation target and ECB inflation projections on inflation expectations. Our analysis indicates that in the post-crisis period longer-term inflation expectations have become somewhat more sensitive to shorter-term ones and to actual HICP inflation. We also find that the ECB inflation projections have recently become more important for short- and medium-term expectations of professional forecasters and at the same time the role of the ECB inflation target for those expectations has diminished. Overall, our analysis suggests that in recent years inflation expectations in the euro area have shown some signs of de-anchoring.

## 1. Introduction

In recent years the euro area has experienced widely differing inflation episodes: relatively stable price developments in the pre-crisis years, highly volatile inflation rates after the Lehman Brothers collapse and currently a very low inflation regime. Long-term inflation expectations obtained from surveys have been relatively stable, but a marginally declining trend has been observed lately. Recent developments raise the question of how the degree of anchoring of inflation expectations has evolved over time, in particular since the onset of the financial crisis.

The concept of anchored inflation expectations results directly from the discussion on the way in which monetary policy operates. The evolution of macroeconomic theory points out that *“the real influence of monetary policy is less the effect of any individual monthly decision on interest rates and more the ability of the framework of policy to condition inflation expectations”* (King, 2005). This means that an analysis of anchoring of inflation expectations – referring to the level and variability of anticipated future inflation and the disagreement among forecasters (Mehrotra and Yetman, 2014) – should test to what extent the framework of monetary policy is able to manage inflation expectations. Anchoring of expectations is therefore closely related to the literature on central bank credibility.<sup>1</sup>

Jochman et al. (2010) have adopted an alternative way to study anchoring of inflation expectations. They have used flexible

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<sup>1</sup> Central bank credibility is understood as the difference between inflation expectations of economic agents and the central bank's inflation target or forecast (e.g. Faust and Svensson, 2001; Hutchison and Walsh, 1998; Cecchetti and Krause, 2002). Such measures of central bank credibility are consistent with the definitions proposed by Blinder (2000) (*“a central bank is credible if people believe it will do what it says”*) and Cukierman and Meltzer (1986) (*“the absolute value of the difference between policymakers' plans and the public's beliefs about those plans”*).

parametric approach to analyse daily data on inflation compensation derived from the term structure of real and nominal interest rates. More precisely, they have examined the pass-through coefficient, which measures how changes in short-term expectations affect long-term expectations. Inflation expectations are defined to be anchored, if the pass-through coefficient is constant and small. Instead, if the coefficient is close to one, inflation expectations are defined to be unmoored. In the case of contained expectations, the pass-through coefficient is large at (approximately) average levels of short-term inflation expectations, but becomes small as short-term expectations deviate from their average value.

Typically, de-anchoring risks are assessed by focusing solely on long-term expectations, but the responses of long-term inflation expectations to macroeconomic news (e.g. Beechey et al., 2011; Nautz and Strohsal 2015) or to shorter-term inflation expectations (e.g. Lamla and Dräger, 2013) have also been studied. A proper analysis of anchoring of expectations seems to us however more complex. Firstly, it should consider expectations of different groups of economic agents. From the theoretical point of view firms' expectations of future price developments are probably the most interesting, as they are closely related to price setting behaviour. Due to data availability problems consumer inflation expectations have been used to proxy firms' expectations<sup>2</sup> (e.g. Coibion and Gorodnichenko, 2015; Friedrich, 2016), but consumer expectations are obviously important also themselves, for understanding decisions related to consumption, saving and wage bargaining. Secondly, the anchoring effects, i.e. the degree to which monetary policy is able to condition inflation expectations, must be analysed at different forecast horizons, not only for the long-term. Also, the sensitivity of longer-term expectations to shorter-term expectations and to actual inflation needs to be examined.

The aim of the study is to analyse anchoring defined as the central bank's ability to manage inflation expectations. This topic seems relevant given the role inflation expectations play in price and wage formation (e.g. Paloviita, 2008; Forsells and Kenny, 2010; Anderson and Maule 2014; European Central Bank, 2016). We examine whether the degree of anchoring of survey-based inflation expectations of consumers and professional forecasters has varied over time in the euro area. Using aggregated quarterly survey data, we examine how inflation expectations depend on actual inflation, using the approach of Ehrmann (2015), and we also investigate the relationship between longer- and shorter-term inflation expectations. Then we use the Bomfim and Rudebusch (2000) method to analyse the anchoring of long-term inflation expectations to the ECB inflation target and extend this method to describe the behaviour of short- and medium-term inflation expectations.<sup>3</sup> The novelty of our approach is in assessing the effectiveness of two main communication tools used by the ECB, i.e. the inflation target and inflation projections, in influencing inflation expectations. Finally, we use VAR models proposed by Demertzis et al. (2008, 2009) to examine the degree to which implicit anchors for inflation expectations are consistent with the ECB inflation target. Our sample period is 1999Q1–2015Q3, which includes both the financial crisis period and the current low inflation regime. Due to the increased economic uncertainty and unconventional monetary policy measures implemented after the Lehman Brothers collapse, we pay special attention to possible changes in anchoring over the last few years.

The article is organised in the following way. Our data are described in Section 2 and the empirical analysis is presented in Section 3. Concluding remarks are provided in Section 4.

## 2. Data

Inflation expectations can be measured directly in two different ways: either based on survey data or on financial market data. As Cunningham et al. (2010) point out, both approaches have advantages and shortcomings. Surveys are useful, because they are addressed to different types of agents (households, enterprises and professional experts) who make price and wage setting decisions. Since surveys have typically been conducted for many decades, they can be used to make comparative analysis from previous inflationary or deflationary episodes. However, surveys usually miss recent changes in inflation expectations (as they are conducted only monthly or quarterly) and those formed among consumers are potentially biased if frequently purchased goods and services are over-weighted in expectations' formation. Also strategic survey responses (for example, participant may have incentives to declare expectations close to the consensus forecasts) and assumptions related to quantification of qualitative survey responses may cause bias to survey-based measures of inflation expectations. Advantages of market-based measures of inflation expectations are related to data frequency (available daily) and a wide range of forecast horizons. In addition, market-based inflation expectations are potentially more accurate than survey-based measures of inflation expectations, since in financial market agents "vote" with real money. However, inflation expectations based on financial market information are potentially biased due to liquidity risk, inflation risk, and institutional distortions. During times of market stress, as experienced after the collapse of Lehman Brothers, a flight to quality may distort nominal yields disproportionately, leading to measurement errors in market-based measures of inflation expectations.

In our study we consider survey-based measures of inflation expectations of professional forecasters and consumers for 1999Q1–2015Q3. In the case of the professional forecasters, we use one-year ahead, two-years ahead and 4–5-years ahead inflation forecasts from the ECB Survey of Professional Forecasters (SPF), conducted every quarter.<sup>4</sup> In the case of consumers, we use the European

<sup>2</sup> Such an assumption may not necessarily be appropriate. E.g. direct measures of enterprises' inflation expectations in Poland seem to be formed similarly to financial sector analysts' inflation expectations and differently from consumer inflation expectations (Łyziak, 2013).

<sup>3</sup> In the context of our analysis, the short-term forecast horizon is one year and the medium-term forecast horizon is two years. Correspondingly, the long-term forecast horizon is 4–5 years, which is the longest horizon available in the ECB SPF.

<sup>4</sup> Data source: <http://www.ecb.europa.eu/stats/prices/indic/forecast/html/index.en.html>. The ECB SPF is described in detail in Bowles et al. (2007). See <http://www.ecb.europa.eu/stats/pdf/spfquestionnaire.pdf?9c65f6e4b965a8832693dcb0aebff66> for a survey questionnaire in January 2013 and [http://www.ecb.europa.eu/stats/prices/indic/forecast/shared/files/dataset\\_documentation\\_csv.pdf?76c07dc372dffabc3fec09d8cefbf682](http://www.ecb.europa.eu/stats/prices/indic/forecast/shared/files/dataset_documentation_csv.pdf?76c07dc372dffabc3fec09d8cefbf682) for a description of the ECB SPF data set.

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