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## Where do they care? The ECB in the media and inflation expectations

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### ABSTRACT

This paper examines how news coverage of the European Central Bank (ECB) affects consumer inflation expectations in the four largest euro area countries. Utilizing a unique dataset of multi-lingual European news articles, we measure the impact of ECB-related inflation news on inflation expectations. Our results indicate that German and Italian consumers are more attentive to this news, whereas in Spain and France, we observe no significant response. The research underscores the role of national media in disseminating ECB messages and the diverse reactions among consumers in different euro area countries.

### KEYWORDS

ECB; inflation expectations; news coverage; textual analysis

### JEL CLASSIFICATION



D80; E32; E66

## I. Introduction

Monetary policy involves managing inflation expectations of economic agents. To this end, communication has become an increasingly important tool for central bankers (Blinder et al. 2008), who communicate through various channels, including press conferences, statements, speeches, and interviews. However, economic agents typically receive this communication indirectly through the news media, which play a crucial role in transmitting central bank communication to financial markets and the wider public (Berger, Ehrmann, and Fratzscher 2011; Hayo and Neuenkirch 2015) and may help households form (accurate) expectations (Conrad, Enders, and Glas 2022; Lamla and Lein 2014; Larsen, Thorsrud, and Zhulanova 2021). The European Central Bank (ECB) faces a particular challenge in its communication: The currency union is characterized by considerable heterogeneity in terms of economic conditions and the impact monetary policy has on them (Corsetti, Duarte, and Mann 2022), perceptions of the ECB (Bergbauer et al. 2020), and cultural aspects such as language. This emphasizes the role of the national media in transmitting the central bank's messages and influencing how people form their expectations.

This paper studies the potential heterogeneity in agents' reactions to news about the ECB among euro area member states.<sup>1</sup> We construct a novel dataset of economic newspaper articles covering the ECB from the four major euro area countries and identify an inflation topic in this news coverage. Employing country-level structural vector autoregressions, we analyse whether national inflation expectations react to an increase in national ECB-related inflation news. Our results indicate that inflation expectations increase in Germany and Italy when there is an unexpected rise in ECB inflation news, suggesting that consumers pay attention to news coverage about the ECB in those countries, whereas no significant response is observed in France and Spain. This may be due to differences in knowledge of or interest in the ECB, or to a country-specific focus when it comes to news on price developments.

Our findings provide a first insight into the heterogeneity of consumer reactions to ECB communication as picked up in the news and suggest that the ECB may have to adapt its messages in order to reach the entire population of the euro area in equal measure. Therein, our research contributes to the broader literature on the transmission of monetary policy in the euro area and the perception of central bank communication.

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<sup>1</sup>Previous studies have shown that country-specific data may have a significant effect on euro-area wide inflation expectations, see, for example, Garcia and Werner (2018).

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## II. Data and methodology

### News data

Our original dataset comprises all articles mentioning the ECB from the major daily economic newspaper of each of the four largest euro area economies: The Handelsblatt (Germany), Il Sole 24 Ore (Italy), Les Echos (France) and El País/Cinco días (Spain), covering the period from January 1999 to July 2022. In order to ensure that the included articles are specifically about the ECB (rather than just mentioning it in passing), we select articles in which at least one in 100 words is *European Central Bank* or *ECB*. The resulting dataset contains approximately 60,000 articles (Table 1). For our analysis, we define total volume of ECB news coverage as the number of articles per country and month.

The news articles are written in the native language of each country, i.e. in German, Italian, French and Spanish, respectively. Whilst this is a desirable feature for the identification of heterogeneity among euro area member states, it makes textual analysis cumbersome and cross-country comparisons difficult. To tackle this issue, we translate all articles into English using automated translation<sup>2</sup> before preprocessing the translated text.<sup>3</sup> This ensures that our shock measure is comparable across countries.

To classify the news content, we use a Latent Dirichlet Allocation (LDA) model (Blei et al. 2003), where an article is treated as a mixture of topics while each topic is treated as a mixture of words. We run an LDA model with 20 topics on the entire translated and preprocessed sample of what we identify as *ECB articles*, resulting in common

topics across countries. We found that 20 topics gave a good result, where the topics were neither too broad nor too narrow.<sup>4</sup> We single out the topic concerned with inflation, which is illustrated as a word cloud in the left panel of Figure 1, and define ECB inflation news as the proportion of each article dedicated to that topic. As we are interested in monthly inflation news, we follow the approach of Hansen et al. (2018) by aggregating all articles per month and country into one document and re-estimating the document-topic distribution on each country-month aggregate while keeping the topics fixed. The right panel of Figure 1 displays the monthly levels of inflation news in the coverage of the ECB in each euro area member state. While the coverage of inflation seems to follow similar dynamics across countries over time, with higher interest in the topic during periods of increased inflation and a lower inflation focus during the sovereign-debt crisis, there are also some notable differences, with e.g. greater relative interest in inflation in Spain during the mid-2000s and more prominent coverage in Germany during the COVID-19 pandemic and the energy crisis.

Finally, we construct an article sentiment measure based on a simple dictionary approach. Utilizing the dictionary developed by Loughran and McDonald (2011), we subtract the number of negative terms from the number of positive terms and normalize this measure by the length of the article.<sup>5</sup> To derive a monthly sentiment measure, we calculate the average sentiment for each country and month. We then adjust the resulting time series at the country level to account for potential biases in media reporting specific to each country.

**Table 1.** Descriptive statistics of newspaper articles.

	Germany	Italy	France	Spain	Total
Total number	48457	45262	21710	10366	125795
ECB articles	26192	17408	7591	8615	59806

Total number is the number of articles that mention the ECB. ECB articles are those, in which at least one in 100 words is European Central Bank or ECB.

### Expectations and inflation data

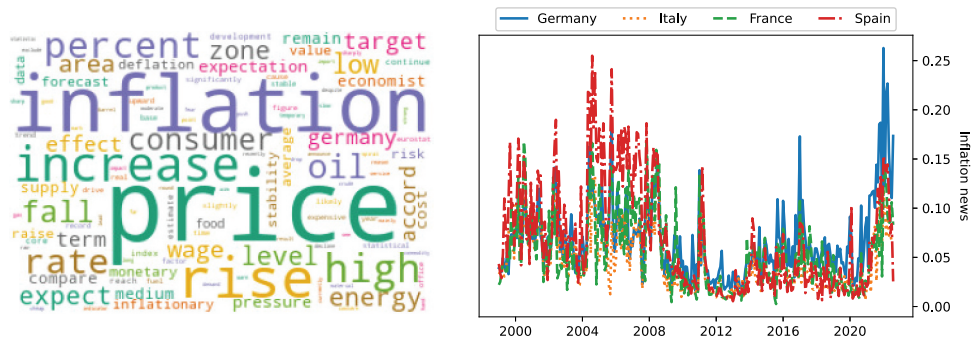
We use monthly consumer inflation expectations data provided by the European Commission (EC)

<sup>2</sup>We use the GoogleTranslator package in Python to translate the text. Note that the newspapers disclaim liability for any translation errors resulting from automatic translation.

<sup>3</sup>Our preprocessing steps are standard in the NLP literature. First, we remove special characters, numbers, stopwords and punctuation. Second, we convert the remaining text into lower case. Finally, we lemmatize the text.

<sup>4</sup>As discussed by Chang et al. (2009) improving the fit of a topic model by increasing the number of topics can lead to less interpretable topics.

<sup>5</sup>We remove monetary policy specific terms that would be picked up by the dictionary, such as 'negative rate' and 'quantitative easing'. As such, our measure is similar to Picault et al. (2022). However, as we aim to incorporate not only the media's own opinion but also the original message by the ECB, we do not exclude direct quotes or mentions of the ECB and its council members.



**Figure 1.** ECB inflation news. Left panel: Word cloud. The 200 words with the highest probabilities are shown. The relative size of the words corresponds to the relative probability of that word occurring in the topic distribution. Right panel: Inflation news measure, defined as the share of ECB news devoted to the inflation topic. Re-classified topic distribution on per-country monthly aggregated articles.

for Germany, Italy, France and Spain, which are available only on a qualitative level. Asked about their expectations regarding price developments over the following twelve months, participants have five answer possibilities: increase more rapidly (*PP*), increase at the same rate (*P*), increase at a slower rate (*E*), stay about the same (*M*) and fall (*MM*). Given the percentage of respondents for each answer, a balance (*B*) is computed as  $B = PP + P/2 - M/2 - MM$ . An equivalent measure is computed for participants' perceptions of price developments over the previous 12 months.<sup>6</sup>

For our inflation measure, we collect the monthly Harmonized Index of Consumer Prices (HICP) for each of the four countries from Eurostat. All expectations and inflation measures are available for the sample of January 1999 to July 2022.

### Estimation

We develop a model to estimate the impact of inflation news on inflation expectations, taking into account factors such as actual inflation, consumer perceptions, and the volume of ECB news coverage. We use a structural vector autoregressive (SVAR) model for each country and estimate it using Bayesian methods and two lags of the dependent variables as selected by the average of different information criteria (AIC, BIC and HQC).<sup>7</sup> Our VAR model includes six variables in levels, in the

following order: HICP inflation, consumer inflation perceptions and expectations, the volume of ECB news coverage, the inflation topic of ECB news and the sentiment indicator. We employ a recursive scheme to identify an inflation news shock. This shock represents unexpected changes in inflation news not explained by current and past values of inflation, inflation perceptions and expectations or the amount of ECB news coverage.

### III. Results

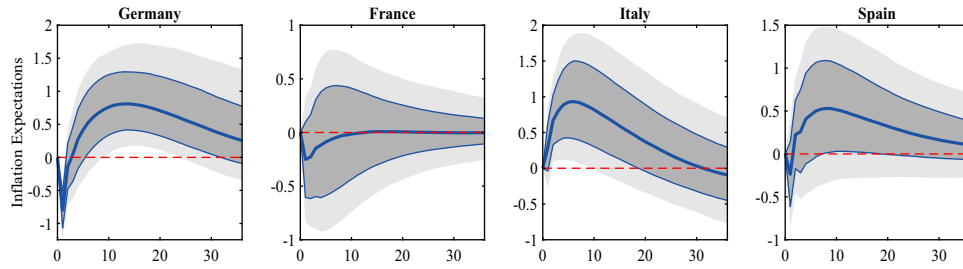
**Figure 2** displays the estimated impulse response functions of inflation expectations following an inflation news shock for each country. The bold, continuous lines represent the median posterior estimates at each time horizon, while the shaded areas show the 68th and 90th posterior probability regions, respectively. The horizontal axis represents time periods in months.

A sudden increase in inflation topic coverage significantly and persistently raises inflation expectations in Germany and Italy. In Spain, a similar response pattern is observed, but it falls short of reaching statistical significance. Conversely, inflation expectations in France remain largely unaffected by the shock.

The differences observed in the impulse responses could be explained by various factors. Firstly, a profound understanding of monetary policy in general and the ECB in particular may foster

<sup>6</sup>While qualitative data does not permit direct comparison to realized inflation nor the computation of forecasting errors, it is strongly correlated with quantitative measures collected on the country level by the ECB since April 2020. The use of the qualitative data further has some clear advantages, first and foremost the data availability across countries and over time.

<sup>7</sup>The results are robust to alternative lag specifications and orderings of the dependent variables.



**Figure 2.** Impulse response functions to a news shock. The bold continuous lines represent the posterior median at each horizon and the shaded areas indicate the 68th and 90th posterior probability regions of the estimated impulse responses. The horizontal axis refers to months after the shock occurred.

trust in the institution (Hayo and Neuenkirch 2014) and lead to a greater interest in the ECB’s actions and communications. In the ECB Knowledge and Attitudes Survey, higher proportions of participants rated their knowledge of the ECB as very good or rather good in Germany and Italy compared to France and Spain (ECB 2022). The survey also revealed considerable heterogeneity among euro area member states concerning their populations’ interest in the ECB. For example, in the 2021 survey round, German participants expressed one of the highest levels of interest, whereas a comparatively large fraction of respondents in France stated a complete lack of interest. This could result in a closer monitoring of relevant news in Germany and Italy and, subsequently, explain their stronger responses to news shocks.

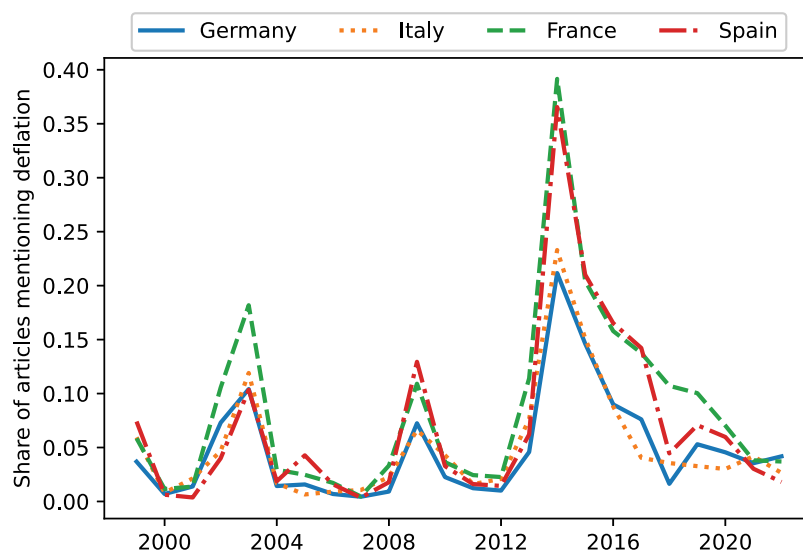
A second possible explanation lies in the country-specific focus on price developments. For example, German consumers may pay more attention to news claiming rising inflation and react accordingly, while readers in France may be more concerned about a risk of deflation and hence respond more to relevant news, thereby offsetting an increasing effect of news of rising prices. In line with this reasoning, national newspapers may set the focus and tone of their reporting differently. Although a thorough analysis of tone and preferences is beyond the scope of this paper, a simple word counting exercise suggests that there is indeed some heterogeneity in the direction of reporting on price developments. Figure 3 shows the share of newspaper articles in our sample that mention the word *deflation* per country and year. In all four countries, the share goes up noticeably in the year 2014, when deflation becomes a threat in the euro area.

However, the increase is much more pronounced in France and Spain, with around 40% of ECB-related articles containing the term compared to between 20 and 25% in Germany and Italy. The share of deflation articles is also consistently higher in France and Spain over the entire sample period, suggesting that there is a stronger focus in those countries on deflation risk. However, removing all articles mentioning deflation from our sample does not change the qualitative results.

#### IV. Conclusion

In this paper, we have presented an analysis of how news coverage of the European Central Bank (ECB) by major business newspapers in Europe impacts inflation expectations in Germany, Italy, France, and Spain. Our findings indicate differences in the effects of news coverage of the ECB on inflation expectations in Germany and Italy as compared to France and Spain. Specifically, we find that Germans and Italians are more sensitive to news about ECB policy actions than their counterparts in France and Spain.

The differences in the effects of news coverage on inflation expectations may be attributed to a variety of factors, such as general knowledge of the ECB in the country and consumer preferences. Our findings suggest that policymakers and central bankers should be mindful of these differences when communicating their policy actions to different countries and regions within Europe. This can help to ensure that policy messages are received and interpreted appropriately by different audiences, leading to more effective policy outcomes.



**Figure 3.** Share of articles mentioning deflation. The share is defined as number of articles that mention the term deflation divided by the total number of articles per country and year.

Our analysis is subject to a number of caveats that prompt further research. First and foremost, our measure cannot without limitations be interpreted as transmission of ECB communication: The inflation news shock could also be understood as news about future inflation, distortions in journalists' views, fake news, or other possibilities, and thus contains a lot of noise. A more comprehensive analysis is needed to clarify this transmission channel of central bank communication. It is also beyond our scope to thoroughly investigate the reasons behind the differences in responses. More in-depth research will help to shed light on the sources of heterogeneity in order to understand how central bank information reaches the public across the euro area and to guide appropriate policy reactions.

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### Disclosure statement

No potential conflict of interest was reported by the author(s).

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