

# Inflation Target Credibility in Times of High Inflation

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Discussion Paper

Economics

2022/5

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July 9, 2022

We use a representative online survey to investigate the inflation expectations of German consumers and the credibility of the ECB's inflation target during the recent high inflation period. We find that credibility has trended downwards since summer 2021, reaching an all-time low in April 2022. The high correlation between inflation expectations and the actual rate of inflation strongly indicate that inflation expectations have been de-anchored from the inflation target. With increasing inflation, German consumers are more convinced that - in contrast to the ECB's inflation target - inflation will be well above 2% over the medium term.

*Keywords:* Credibility of Inflation Targets, Household Inflation Expectations, Expectation Formation

*JEL classification:* C83, E31, E52, E58

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\*We thank the Civey team for their support and for providing us with the data.

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# 1 Introduction

Inflation expectations have become a main indicator for the credibility of a central bank's inflation target. Following Coibion et al. (2020), monitoring and understanding the inflation expectations of households could be particularly important in times of unconventional monetary policies that are thought to operate primarily through expectation channels. Consequently, there has been an increased interest in the analysis of household expectations and several new surveys, like the Fed's Survey of Consumer Expectations (SCE), the Bundesbank's Online Panel (BOP-HH), or the ECB's Household Finance and Consumption Survey (HFCS), have been launched.

In accordance with their central role in modern theories of monetary transmission, the literature analyzing survey data of inflation expectations has increased remarkably in recent years. In line with earlier findings, recent contributions confirm that household inflation expectations are biased and inefficient from the perspective of rational expectations, see D'Acunto et al. (2022). Yet the revealed level of ignorance about the actual rate of inflation and the central bank's inflation target has been surprising for many researchers inside and outside central banks. For example, the Chicago Booth Expectations and Communications Survey suggests that almost 40% of the respondents believe that the Federal Reserve was targeting an inflation rate of 10% or more, see Coibion et al. (2022b). Coibion et al. (2021) find that even a prominent change in the monetary policy strategy, such as the modification of the central bank's inflation target, has no significant impact on household inflation expectations.

Households notoriously overestimate the risk of future inflation and widely ignore the usual channels of monetary policy communication, see Coibion et al. (2022b). However, during the COVID-19 crisis, the behavior of inflation expectations in the U.S. and the euro area even contradicted standard economic theory. In fact, Dietrich et al. (2022) (for the U.S.) and Coleman and Nautz (2022) (for Germany) showed that inflation expectations of consumers significantly increased at a time when inflation rates have been persistently below 2% and the economies headed to the largest reces-

sion in recent history.

The starting point of the current paper is the observation that the inflationary environment has changed dramatically ever since. In Germany, inflation rates have increased rapidly from about 2% in May 2021 to almost 8% in May 2022. How has this return of inflation affected inflation expectations and the credibility of the ECB's inflation target? If inflation expectations were firmly-anchored and inflation target credibility was high, then longer-term inflation expectations should not respond to an increase of inflation that the central bank describes as a transitory phenomenon.<sup>1</sup> Revisiting and updating the data of Coleman and Nautz (2022), our results suggest that the ECB's optimistic view on medium-term inflation is not shared by the public.

Before the return of inflation, i.e. until summer 2021, the credibility of the ECB's inflation target seemed to have stabilized after a one-time decrease in the early phase of the pandemic, see Coleman and Nautz (2022). The current paper shows that this outlook was overly optimistic. Updating the sample period to May 2022 reveals that the return of inflation resulted in a dramatic downward trend of inflation target credibility. Coibion et al. (2022a) found that the de-anchoring of U.S. household inflation expectations stirred by the outbreak of the pandemic was accompanied by a rise in disagreement and higher uncertainty about future inflation. Our results show that — when inflation returned — German consumers not only increasingly agree about the low-credibility of the inflation target, there are also fewer survey respondents that are uncertain about the course of inflation they expect over the medium term.

The rest of our paper is structured as follows. Section 2 introduces the survey data and the measure of inflation target credibility. Section 3 shows how inflation target credibility, medium-term inflation expectations and disagreement among survey respondents evolved during the recent period of high inflation. Finally, we present our results obtained from a new measure of uncertainty about the credibility of the inflation target. Section 4 summarizes our main results.

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<sup>1</sup>In March 2022, for example, when inflation in the Euro area was around 6%, the ECB's projections for euro area inflation rates in 2023 and 2024 have been 2.1% and 1.9%, see [https://www.ecb.europa.eu/pub/pdf/other/ecb.projections202203\\_ecbstaff~44f998dfd7.en.pdf](https://www.ecb.europa.eu/pub/pdf/other/ecb.projections202203_ecbstaff~44f998dfd7.en.pdf).

## 2 The Survey Data

### 2.1 Survey Description

The empirical analysis is based on a survey run by Civey, Germany's largest company for online surveys. Civey surveys are spread out across more than 25,000 partner websites including major German online-newspapers. The Civey panel consists of approximately one million German citizens that signed up using their email-address and created a user profile that provides further personal information including their age, gender and the respondent's postcode. From February 2019 until the end of May 2022, the total number of participants in this sample has increased steadily to approximately 120,000 respondents.

Civey collects data through non-probability sampling, a survey technique that has become increasingly popular for market research, election polls and also for economic research, see e.g. Binder (2020). In these surveys, the attention is not restricted to a pre-selected, relatively small sample. Rather, each member of the large Civey panel is allowed to participate. The use of non-probability online surveys is a convenient way to enlarge the sample but it also implies that size and composition of the sample change on a daily basis. Representative results are obtained using official socio-demographic data to weight survey responses accordingly. The representative results, published by Civey on a daily basis, are based on at least 5000 observations. Survey participants obtain aggregate results after they have responded. Therefore, near-term second answers are not allowed to rule out that participants adjust their answer in response to the published survey results. Ruling out repeat participants avoids "learning-through-survey" effects.<sup>2</sup>

Coleman and Nautz (2022) illustrate the external validity of the non-probability

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<sup>2</sup>According to Kim and Binder (2020), these effects are large for household inflation expectations taken from the Fed's Survey of Consumer Expectations (SCE). They show that repeat survey participants generally have lower inflation expectations and uncertainty, particularly if their initial uncertainty was high.

sampling approach by comparing survey results on short-term inflation expectations obtained by Civey with those taken from the well-established consumer survey of the European Commission. For more technical details about the survey methodology, see Civey (2020).

## 2.2 The Credibility Indicator

In comparison with other surveys on household inflation expectations, it is a distinguishing feature of the current survey that it uses the exact wording of the ECB's definition of price stability. As a consequence, it yields a direct measure of the credibility of the inflation target:<sup>3</sup>

In what range do you think the annual inflation rate will be over the medium term?

It will be ...

- |                           |                          |
|---------------------------|--------------------------|
| (A) ... clearly above 2%  | (D) ... clearly below 2% |
| (B) ... slightly above 2% | (N) Do not know          |
| (C) ... close to 2%       |                          |

Taking into account the ECB's change in the definition of the inflation target, the answer C was "below but close to 2%" until 8, July 2021. The answers C and, to a lesser degree, B are compatible with a credible inflation target. Following Coleman and Nautz (2022), we summarize the degree of credibility by the indicator variable  $CI = C + \frac{1}{2}B$  where  $CI = 100$  ( $CI = 0$ ) indicates full (zero) credibility of the inflation target.

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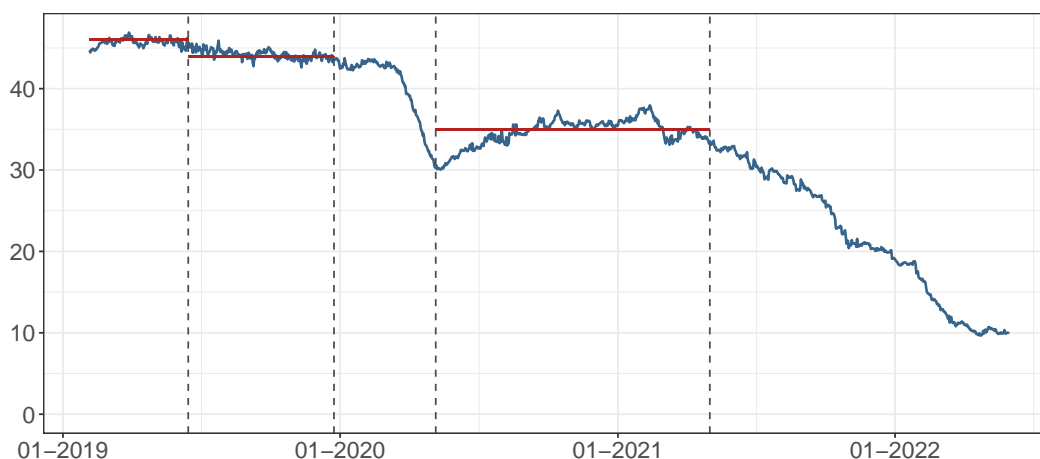
<sup>3</sup>The actual survey question is stated in German and applies to the official translation used by the ECB and the Bundesbank, i.e. *unter aber nahe bei 2% in der mittleren Frist* and, since July 2021, *nahe bei 2%*, see <https://widget.civey.com/4417>.

### 3 Empirical Results

#### 3.1 Inflation Target Credibility

The results obtained for the credibility indicator  $CI$  are shown in Figure 1. Until May 2021, the findings of Coleman and Nautz (2022) are reproduced who find that  $CI$  slightly decreased throughout 2019, collapsed in March 2020 but seemed to stabilize on a lower level since the second half of 2020. Unfortunately, this stabilization of credibility turns out to be transitory: since summer 2021 the credibility index has trended downwards reaching its all-time low of 9.65 in April 2022.

Figure 1 The Credibility Indicator

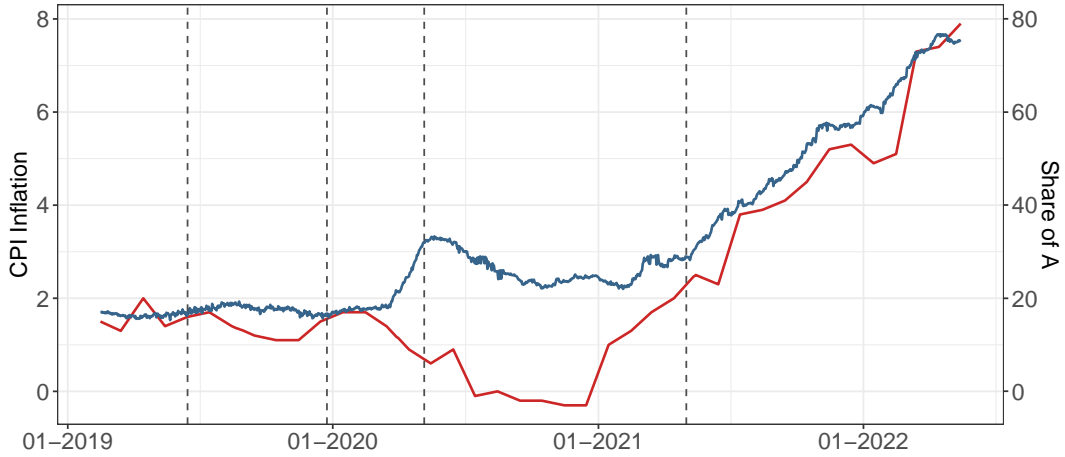


Notes: The Figure presents the credibility indicator  $CI = C + \frac{1}{2}B$  obtained for the ECB’s inflation target. The vertical lines indicate the credibility regimes identified by Coleman and Nautz (2022) from 2019 until May 2021 (horizontal lines indicate the mean of  $CI$ ). We extended their sample period to May 31, 2022.

The survey data provides further insights into the nature of the observed credibility decline. Figure 2 demonstrates that changes in the credibility index are mainly driven by the share of  $A$  answers. In 2020, when inflation rates had been persistently below the target, the increasing share of German consumers expecting too-high inflation over the medium term might have been puzzling. In 2021, when the rate of inflation started to increase, it is the size, not the direction of the change in  $A$  an-

swers that remains remarkable. Since then, the high correlation between longer-term inflation expectations and the actual rate of inflation strongly indicate that inflation expectations of German consumers have been de-anchored from the inflation target.

Figure 2 Inflation and the share of medium-term inflation expectations well above 2%



Notes: The Figure shows shows monthly data for actual CPI inflation in Germany (red line) and the share  $A$  of survey respondents expecting inflation to be "well above 2%" over the medium term (blue line). For more information, see Figure 1.

### 3.2 Disagreement about Inflation Target Credibility

How has disagreement about inflation target credibility evolved in the recent high inflation period? Unfortunately, our data does not allow to derive a disagreement measure that accounts for the uncertainty at the individual level, see Rich and Tracy (2021). However, the impact of individual uncertainty among respondents that choose the answer  $A, B, C,$  or  $D$  might not be critical in our application. Because survey respondents that are highly uncertain about their answer will not choose  $A, B, C$  or  $D$  but the "do not know" category  $N$ . In the following, we define disagreement ( $Dis$ ) at day  $t$  as the weighted standard deviation of survey responses:

$$Dis_t = \sqrt{A_t^*(1 - \mu_t^*)^2 + B_t^*(0.5 - \mu_t^*)^2 + C_t^*(0 - \mu_t^*)^2 + D_t^*(-1 - \mu_t^*)^2} \quad (1)$$

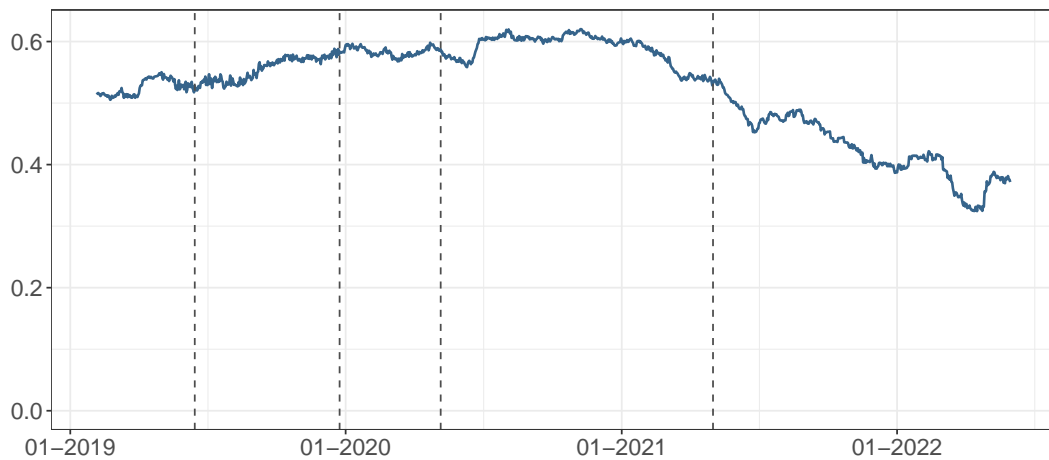


Taking into account the sign and the size of the deviation of medium-term expectations from the inflation target, we code the responses  $A, B, C,$  and  $D$  by  $+1, +1/2, 0,$  and  $-1,$  respectively. In order to control for the time-varying share of "do not know" ( $N$ ) responses we consider  $N$ -adjusted shares and define, for example,  $A^* = \frac{A}{1-N}$ . Adjusting for  $N$  ensures that  $A^* + B^* + C^* + D^* = 1$ . Therefore, the average response at day  $t$  is obtained as

$$\mu_t^* \equiv 1 \cdot A_t^* + 0.5 \cdot B_t^* + 0 \cdot C_t^* + (-1) \cdot D_t^*$$

Higher values of  $Dis_t$  are associated with higher disagreement. Specifically,  $Dis_t$  ranges from 0 (when everyone provides the same answer) to 1 (when the share of both extreme answers ( $A, D$ ) is 50%). Figure 2 and Figure 3 show that – with rising rates of actual inflation – survey respondents increasingly agree that inflation will be clearly above 2% over the medium term.

Figure 3 Disagreement about medium-term inflation expectations



Notes: The Figure shows  $Dis_t$ , a measure of disagreement among survey respondents about medium-term inflation expectations, see (1).  $Dis_t$  ranges from 0 (when everyone provides the same answer) to 1 (when the share of both extreme answers ( $A, D$ ) is 50%). For more information, see Figure 1.

### 3.3 Uncertainty about Inflation Target Credibility

The empirical literature suggests various ways to quantify the level of uncertainty related to survey measures of inflation expectations. Typically, the analysis of uncertainty about expected inflation requires information about subjective probability distributions. The Survey of Consumer Expectations (SCE) by the Federal Reserve Bank of New York, for example, elicits a subjective probability distribution for inflation by asking for the percent chance that inflation might take values in each of a set of pre-defined non-overlapping bins. The resulting individual distributions can be used to estimate the average standard deviation and (with some additional assumptions) the percentiles of the distribution of consumer inflation expectations as an aggregate measure of uncertainty about future inflation. D’Acunto et al. (2022) discuss the multiple aspects of the survey design that might affect the outcome of distribution questions. In our application, the survey about the credibility of the inflation target elicits a straightforward measure of uncertainty that does not require additional information based on sophisticated subjective probability distributions: in the following, we propose the share of respondents that “do not know” how inflation will evolve over the medium term as a proxy for the prevailing uncertainty about the credibility of the inflation target.

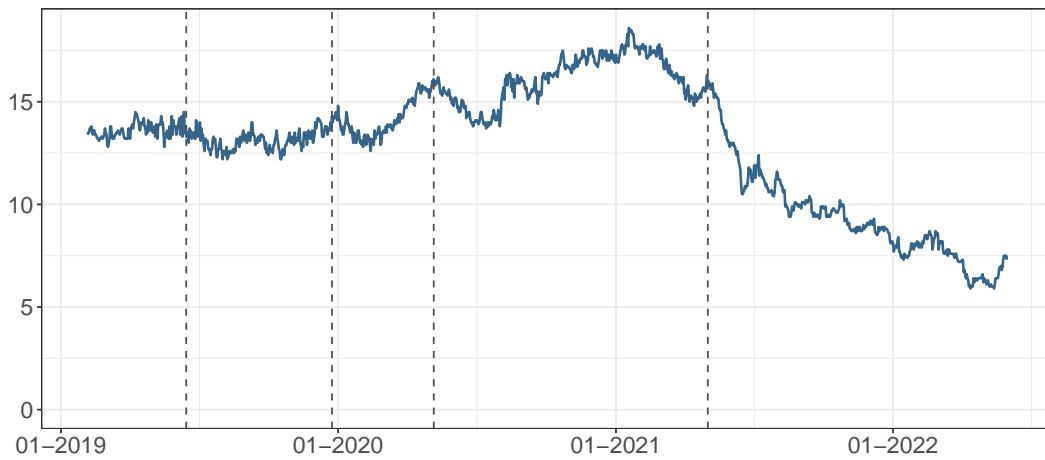
In general, the role and information content of “do not know” or - as in our notation -  $N$  answers depend on the survey question and the aim of the study. There are surveys where “do not know” answers can be simply treated as missing observations. Researchers may probe survey participants that “do not know” to obtain more information from those participants that might have been too comfortable to answer seriously in the first round. However, follow-up probing questions may lead to a distorted measure of what people truly think about future inflation, see Kuha et al. (2018). In some application, it make sense to omit the “do not know” option from the list of possible answers. For example, Bucher-Koenen et al. (2021) show that disclosing the “do not know” answer reduces the gender gap in survey measures of

financial literacy. Interestingly, a gender gap in the share of “do not know” responses is also present in our data, see Figure 5 in the appendix.

In the February 2021 wave of the Bundesbank Online Panel, survey participants were asked to state their “degree of trust in the ECB’s ability to achieve price stability” on a scale from 0 (no trust) to 10 (full trust). Hoffmann et al. (2022) report that even in February 2021, when inflation was still very low, the average trust level does not exceed 5 and only very few respondents fully trust the ECB. While the distribution of answers could be used to derive a level of disagreement about the trust in the ECB’s inflation target, the survey design does not allow to draw conclusions about the prevailing uncertainty. In particular, there is no trust-related “do not know” option. Rather, survey participants who are not able to quantify their level of trust (probably because they are too uncertain about it) can only choose the answer “do not know the European Central Bank”. In our survey on inflation target credibility, the information content and the interpretation of the “do not know” response is more obvious. “Do not know” (*N*) is exactly the answer you should give if you feel too uncertain about the rate of inflation over the medium term because you perceive the credibility of the central bank’s target as too low.

It is important to emphasize that our data is taken from an *opt-in* survey. Therefore, in contrast to many other surveys, our respondents are intrinsically motivated to answer the question and are interested in the topic. In particular, survey participants do not respond “do not know” only because they are reluctant or unable to give a more informative response. Particularly, consumers who “do not know the European Central Bank” would hardly decide to participate in a survey about the credibility of the inflation target. Typically, the motivation to participate in a survey is less intrinsic. Survey participants run by Amazon-Turk have to be paid for each answer and monetary incentives are also common for participants in standard consumer surveys. By contrast, in our survey, the only benefit for participants is the access to aggregate results after they have responded.

Figure 4 Uncertainty about inflation target credibility:  
Evidence from the share of “do not know” answers



Notes: The Figure shows the share  $N$  of “do not know” answers in the survey about inflation expectations over the medium term (in percentage points). For more information, see Figure 1.

Figure 4 shows the share  $N$  of “do not know” answers. In line with the findings of Coibion et al. (2022a) obtained for the U.S., uncertainty in Germany rose in the early phase of the pandemic (the third credibility regime). However, in the recent high inflation period, German consumers are increasingly convinced that - in contrast to the ECB’s inflation target - inflation will be well above 2% over the medium term.

## 4 Concluding Remarks

The current paper uses a representative online survey of German consumers to investigate the credibility of the ECB’s inflation target during the recent high inflation period. Our results show that since summer 2021 credibility has significantly declined. Credibility has fallen to all-time lows in April 2022 mainly due to a stark increase in survey respondents expecting inflation well above 2% over the medium term. We find that the decline in credibility is neither attended with higher disagreement among survey participants nor with higher uncertainty about future inflation. Instead, German consumers increasingly agree upon the low credibility of the infla-

tion target and a record-low share of respondents “do not know” in what range they expect the inflation rate will be over the medium term.

Until spring 2022, the ECB viewed the return of inflation in 2021 as a transitory phenomenon, a sharp contrast to consumer expectations. In her macroeconomic projections of June 2022, however, the ECB admitted that inflation will be higher and more persistent than expected in its earlier publications. Consequently, the ECB decided to stop her fight against deflation and several unpopular policy measures including large scale asset purchase programs and negative interest rates are planned to phase out eventually. Our results suggest that this change of monetary policy is in accordance with expectations of the public and, thus, may be an important step to regain credibility of the ECB’s inflation target.

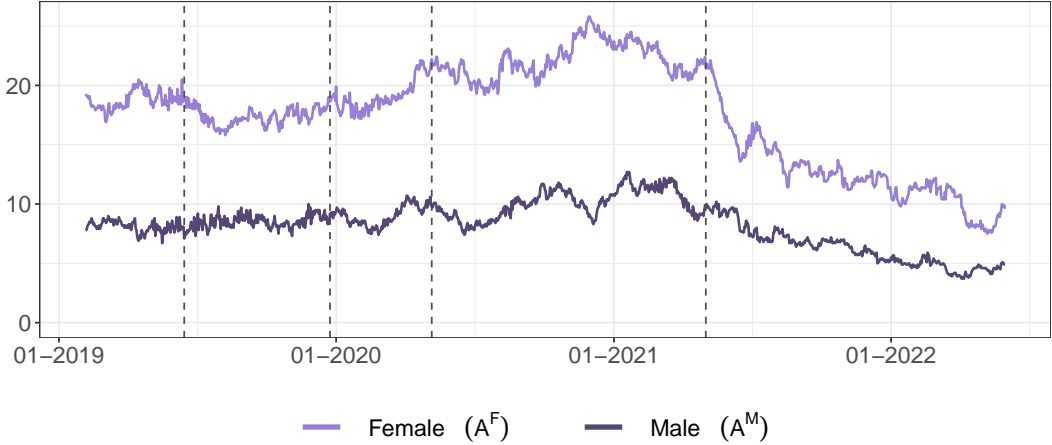
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# Appendix

Figure 5 Uncertainty about inflation target credibility by gender:  
Evidence from the share of “do not know” answers



Notes: The Figure shows the share  $N$  of “do not know” answers in the survey about inflation expectations over the medium term for females and males from Jan 2019 until May 2022 (in percentage points). The vertical lines indicate the credibility regimes identified by Coleman and Nautz (2022).

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