Received: 28 November 2025 | Accepted: 4 February 2026

DOI: 10.1111/coep.70028

ORIGINAL ARTICLE

CONTEMPORARY ECONOMIC POLICY

Inflation target credibility and the Taylor rule

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Funding information
Deutsche Forschungsgemeinschaft, Grant/Award Number: NA 365/8; Deutsche Bundesbank

Abstract

We investigate how the monetary policy of the European Central Bank affects consumers' perceptions about the credibility of the inflation target. Monetary policy is assessed by the gap between the actual policy rate and a Taylor rate to approximate the interest rate expected by the public. Drawing on survey data for German consumers, our results suggest that the massive dent in inflation target credibility observed from 2021 to 2023 could have been ameliorated by a more decisive tightening of monetary policy. Therefore, simple outcome-based interest rate rules may deserve more attention in the communication of monetary policy.

KEYWORDS
consumer inflation expectations, credibility of inflation targets, European Central Bank, Taylor rules

JEL CLASSIFICATION
E43, E52, E58

1 | INTRODUCTION

Inflation targets clarify the meaning of price stability and may even anchor inflation expectations but they can only be effective if their credibility is sufficiently high. This paper investigates to what extent monetary policy can ensure or restore credibility even if current inflation deviates from its target. Coleman and Nautz (2025) use survey data on inflation target credibility (ITC) to analyze how credibility responds to deviations of inflation from the target of the European Central Bank (ECB). However, their analysis assumes that target deviations are the sole drivers of time-varying credibility, leaving no room for the influence of monetary policy actions. Therefore, we extend their analysis of ITC by incorporating monetary policy measures directly controlled by the central bank.

The credibility of the inflation target perceived by consumers should be particularly influenced by monetary policy measures that are highly visible and widely discussed in the media. A natural candidate for such a monetary policy measure is the ECB's deposit rate, the key policy rate during our sample period. From a rational expectations perspective, consumers should respond to monetary policy shocks rather than to partially anticipated changes in policy rates. However, estimates of monetary policy shocks (Jarociński & Karadi, 2020) are hardly acknowledged by the

Abbreviations: ECB, European Central Bank; GDP, Gross Domestic Product; HICP, Harmonized Index of Consumer Prices; ITC, inflation target credibility.

general public. Similarly, shadow rates (Lemke & Vladu, 2017) estimated to circumvent the zero lower bound problem are neither visible to the public nor have they been discussed in the media. Therefore, we assume that consumers gauge the ECB's monetary policy stance primarily through the level of the deposit rate.

In the Euro area, many consumers regarded the policy rate as too low for too long.[1] Yet, how low is too low—from a consumer's perspective? In the following, we assume that a consumer's view of the appropriate interest rate level can be approximated by a simple Taylor rule.[2] Since the Taylor rate explicitly accounts for deviations from the inflation target, closing the gap between the actual policy rate and the Taylor rate should enhance consumers' perceptions of ITC. A significant and plausibly signed response of ITC to the interest rate gap would imply that the central bank can improve its credibility not only in the long run by its inflation performance but also in the short run by its interest rate decisions.

It is important to emphasize that the role of the Taylor rate in this paper is not to provide a sophisticated estimate of the actual or optimal monetary policy. Instead, it serves as a simple proxy and reference point for the policy rate that consumers may have perceived as appropriate. Admittedly, even a simple Taylor rule can be seen as too sophisticated from a consumer's perspective, since it incorporates the unobservable output gap. Therefore, in a robustness analysis, we shall also experiment with interest rate rules that put zero weight on the output gap.

The remainder of the paper is structured as follows. In the next section, we describe the survey data on ITC and the Euro area Taylor rates taken from Tatar and Wieland (2025). Section 3 shows our empirical results on the impact of the ECB's interest rate policy on ITC. Section 4 concludes.

2 | DATA

2.1 | Inflation target credibility

Data on consumers' perceptions about the credibility of the ECB's inflation target are taken from a survey run by Civey, Germany's largest company for online surveys. Civey's panel consists of approximately one million adult German residents with a user profile containing further personal characteristics. From January 16, 2019, until December 31, 2024, more than 140,000 survey participants submitted a total of about 250,000 responses. Because not every user profile provides the full set of personal characteristics, the actual number of observations used in our regressions is 222,203.[3]

The consumer's view on the credibility of the ECB's inflation target is derived from the following survey question:

> In what range do you think the annual inflation rate will be over the medium term? It will be...
> (*A*) ... clearly above 2%
> (*B*) ...slightly above 2%
> (*C*) ... (below, but) close to 2%
> (*D*) ... clearly below 2%
> (*N*) Do not know

Note that the survey question *and* the answer category (C) exactly follow the definition of the ECB's target. In particular, in July 2021, the answer category (C) was adjusted from *below but close to 2%* to the new target *close to 2%*. Accordingly, (C) implies that the inflation target is perceived as fully credible. In contrast, categories (A) and (D) clearly contradict the ECB's inflation target irrespective of the individual consumer's interpretation of "close." Following Coleman and Nautz (2025), we consider both (C) and (B) as compatible with a credible inflation target and define the aggregate ITC indicator ITC as

$$ITC = C + B, \tag{1}$$

where C and B denote the shares of the corresponding answers.

Figure 1 displays the daily credibility measure ITC obtained for the representative consumer together with the monthly rate of inflation. Apparently, the current rate of inflation influences the evolution of ITC but this relation is not obvious. According to for example, Binder (2020) and Binetti et al. (2024), consumers tend to have a stagflationary view of the economy, always associating bad economic times with high rates of inflation. This explains why in Germany, for example, the credibility of the inflation target decreased during the COVID pandemic. More consumers expected

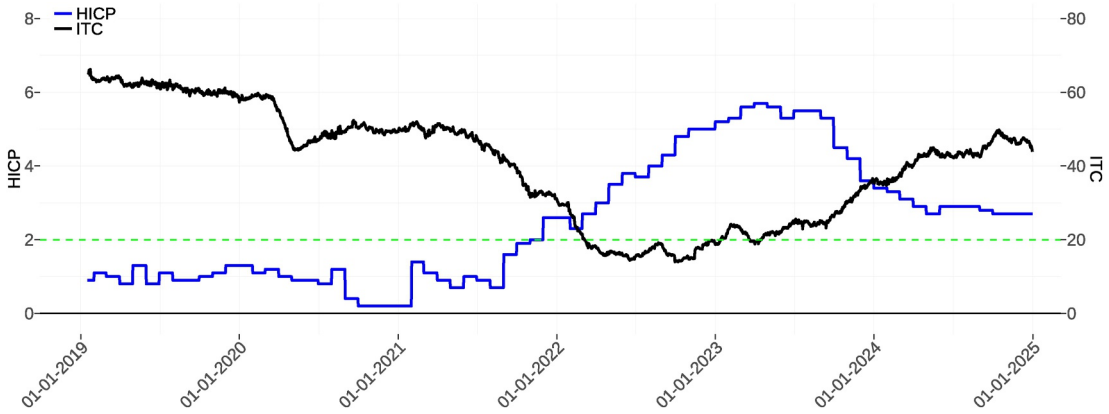

FIGURE 1 Inflation target credibility (ITC) and the rate of inflation. This figure shows the degree of ITC for the representative German consumer (right scale) and the European Harmonized Index of Consumer Prices core inflation (left scale). Green dashed line indicates the ECB's 2% inflation target. Sample period: January 16, 2019 to December 31, 2024.

inflation to increase *clearly above 2%*, even though the inflation rate was too low and the economy headed for a recession, see Coleman and Nautz (2023).

If deviations of inflation from the target were the sole source of time variation in ITC, the influence of monetary policy would be rather limited—at least in the short run. To allow for a more active role of monetary policy in shaping ITC, we extend the empirical analysis of Coleman and Nautz (2025) by incorporating a monetary policy measure that is directly under the central bank's control.

2.2 | The ECB's interest rate policy through the lens of a Taylor rate

Let us now consider the impact of the ECB's interest rate decisions on consumers' perception of ITC. To do this, we propose an interest rate gap, $|i^* - i|$, defined as the difference between the actual policy rate set by the ECB (i) and a hypothetical rate (i^*) that approximates the policy rate consumers assume to be appropriate. Large interest rate gaps indicate that consumers view the policy rate as too low or too high. Consequently, ITC should decrease in the interest rate gap.

While the actual policy rate i is the ECB's deposit rate, the choice for the hypothetical rate i^* is less obvious. i^* must follow a simple rule to offer a realistic perspective on consumers' expectations about the ECB's interest rate policy that accounts for the inflation target and the state of the economy. Therefore, an interest rate derived from a simple Taylor rule is a natural candidate for i^*. In the following, we employ the Taylor rates for the Euro area calculated by Tatar and Wieland (2025). Following Taylor (1993), they define

$$i_t^* = r^* + \pi_t + 0.5(\pi_t - 2) + 0.5\left(y_t - y_t^*\right), \tag{2}$$

where r^* is the natural real interest rate, $(\pi_t - 2)$ is the deviation of inflation from the target and $\left(y_t - y_t^*\right)$ refers to the output gap. Tatar and Wieland (2025) derive Taylor rates for two different inflation measures, the HICP core to exclude volatile energy prices and the Gross Domestic Product (GDP) deflator. GDP data is only available on a quarterly basis. Therefore, the Taylor rates provided by Tatar and Wieland (2025) are also quarterly. To account for the exact timing of the changes in the ECB's policy rate and to fully exploit the daily frequency of the survey data, we construct daily Taylor rates using a weighted average of the quarterly Taylor rates for the current and the previous quarter where the weights depend on the position of day t within the quarter. In accordance with the estimates from European Central Bank (2025), Tatar and Wieland (2025) consider Taylor rates based on $r^* = -1.5\%$ and $r^* = 0.5$.

Figure 2 shows the ECB's deposit rate and the Taylor rates for $r^* = 0.5\%$. Note that both Taylor rates exceed the ECB's deposit rate most of the time. In line with the "too low for too long" hypothesis, the resulting interest rate gaps are particularly high during the period of high inflation. For $r^* = -1.5$, Taylor rates shift downwards and the period of the high interest gap would be a few months shorter. In our application, we prefer the HICP-based Taylor rate because

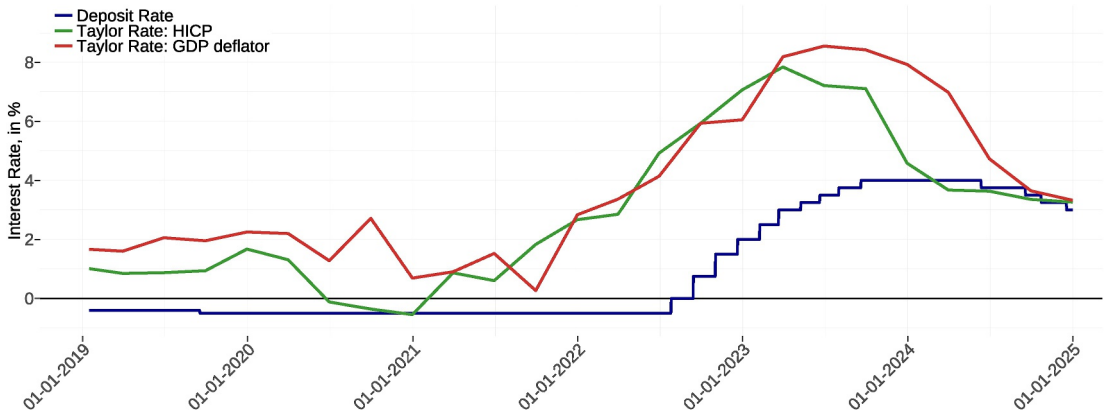

FIGURE 2 The ECB's policy rate and the Taylor rule. This figure shows the ECB's deposit rate and the (daily interpolated) Taylor rates based on Harmonized Index of Consumer Prices and the Gross Domestic Product deflator as provided by Tatar and Wieland (2025), see Equation (2). For both rates, the natural rate of interest r^* is set to 0.5. Sample period: January 16, 2019 to December 31, 2024. ECB, European Central Bank.

the inflation target refers to the HICP and the latter is much more visible for consumers than the GDP-deflator. Moreover, we prefer $r^* = 0.5$ because the higher real rate ensures that Taylor rates do not fall below the deposit rate when the latter is already below zero. In our empirical analysis, we shall also experiment with Taylor rates based on the GDP deflator and $r = -1.5$ to assess the robustness of our results.

3 | INFLATION TARGET CREDIBILITY AND THE INTEREST RATE GAP

3.1 | The empirical model

Coleman and Nautz (2025) investigate the impact of inflation on the credibility of the inflation target but do not account for the ECB's interest rate policy. Therefore, we extend their analysis by incorporating the interest rate gap $|i_t^* - i_t|$, the difference between the Taylor rate (i_t^*) and the ECB's policy rate (i_t). Specifically, our empirical results are based on the following linear probability model:

$$ITC_{it} = \alpha + \beta' X_i + \gamma^+ |\pi_t - 2|^+ + \gamma^- |\pi_t - 2|^- + \delta |i_t^* - i_t| + \varepsilon_{it} \quad (3)$$

where ITC_{it} is the credibility indicator variable that equals one if consumer i answers C or B (and is zero in all other cases). X_i contains a whole battery of personal characteristics of consumer i, including, for example, age, gender, and the level of education.[4] To be consistent with the inflation measure used for the Taylor rate, π_t is the monthly HICP core inflation. Specifically, π_t is defined as the inflation rate in the month before t, the day of the survey response.[5] Following Coleman and Nautz (2025), we consider positive $(|\pi_t - 2|^+)$ and negative $(|\pi_t - 2|^-)$ deviations of inflation from the target separately and allow consumers to respond differently to inflation rates below and above the target.

3.2 | Estimation results

Table 1 summarizes our main results obtained for different versions of the Taylor rate. First, they confirm the asymmetric adjustment of ITC to deviations of inflation from its target for the model extended by the interest rate gap. In accordance with Coleman and Nautz (2025), there is only a plausibly signed response of ITC to target deviations if inflation is above target. In particular, increasing inflation from, for example, 1% to 2% decreases, not increases, the credibility of the target. More importantly, however, and irrespective of the underlying Taylor rate, the corresponding interest rate gap is highly significant and plausibly signed. Column (1) shows the results based on the HICP-based Taylor rate with a real rate of $r^* = 0.5$, the most plausible Taylor rate in our application. Note that this Taylor rate

TABLE 1 Inflation target credibility, inflation and the interest rate gap.

$$ITC_{it} = \alpha + \beta' X_i + \gamma^{+} |\pi_t - 2|^{+} + \gamma^{-} |\pi_t - 2|^{-} + \delta |i_t^* - i_t| + \varepsilon_{it}$$

	(1)	(2)	(3)	(4)	(5)
$\lvert i_t^* - i_t \rvert$	**−0.044** (0.006)	**−0.040** (0.011)	**−0.039** (0.011)	**−0.042** (0.006)	**−0.048** (0.008)
$\lvert \pi_t - 2 \rvert^{+}$	**−0.026** (0.013)	**−0.046** (0.012)	−0.027 (0.018)		**−0.050** (0.012)
$\lvert \pi_t - 2 \rvert^{-}$	**0.084** (0.025)	**0.096** (0.028)	**0.111** (0.029)		
π_t				**−0.045** (0.007)	
r^*	0.5	−1.5	0.5	0.5	0.5
π_t	HICP core	HICP core	GDP deflator	HICP core	HICP core
R^2	9.4	8.6	8.7	9.2	8.8
Obs.	222,203	222,203	222,203	222,203	222,203

Note: $ITC_{it} = 1$ if consumer i answers C or B implying that the inflation target is seen as credible. r^* denotes the real rate and π_t the inflation measure used in the Taylor rule. Results in (4) are based on $ITC_{it} = \alpha + \beta' X_i + \gamma \pi_t + \delta |i_t^* - i_t| + \varepsilon_{it}$ while (5) shows results obtained without below target inflation rates. Controls include the full list of personal characteristics. Standard errors clustered at the monthly level in parentheses. Bold font shows significance at the 5% level. Sample period January 16, 2019 to December 31, 2024.

also leads to the ITC equation with the highest R^2. The estimated coefficients indicate a strong impact of the interest rate gap compared to inflation. While an increase of inflation from, say, 3% to 4% lowers credibility by 2.6, a comparable widening of the interest rate gap would lower credibility by 4.4 percentage points. This suggests that closing the interest rate gap could have helped restore ITC during the recent high inflation period.

3.3 | Counterfactual inflation target credibility

Table 1 shows that inflation target deviations and the ECB's policy rate significantly affect the credibility of the inflation target. To illustrate the economic relevance and size of both effects, we employ the estimated ITC equations for a simple counterfactual analysis. In a first step, we adjust the degree of ITC perceived by the representative consumer (ITC_t) for the estimated impact of the target deviation. Using the estimates from Column (1), the counterfactual degree of ITC adjusted for the impact of target deviations, ITC_t^{π}, is defined as:

$$ITC_t^{\pi} = ITC_t + 0.026 \cdot |\pi_t - 2|^{+} - 0.084 \cdot |\pi_t - 2|^{-} \tag{4}$$

Accordingly, in a second step, $ITC_t^{\pi,i}$ describes the counterfactual degree of ITC if both inflation was on target and the ECB's policy rate followed the Taylor rule:

$$ITC_t^{\pi,i} = ITC_t + 0.026 \cdot |\pi_t - 2|^{+} - 0.084 \cdot |\pi_t - 2|^{-} + 0.044 \cdot |i_t^* - i_t| \tag{5}$$

By construction, the counterfactual series are very close to actual ITC when inflation is close to the target and the deposit rate follows the Taylor rate, see Figures 1 and 2. Note that the resulting counterfactuals should be viewed with caution because they are not immune to the Lucas-critique. However, the increase in credibility implied by higher policy rates and *constant* inflation (as suggested by the counterfactual) can be seen as a lower bound for the actual increase in credibility stirred by higher interest rates *and* the lower inflation implied by more hawkish monetary policy.

Figure 3 displays the actual degree of ITC (ITC) and the counterfactuals obtained from Equations (4) and (5). According to the counterfactual series, the massive dent in ITC observed from 2021 to the end of 2023 could have been ameliorated by an earlier and more decisive tightening of monetary policy. In this period, the ECB's interest rate policy contributed more to the decline in ITC than the actual rate of inflation.

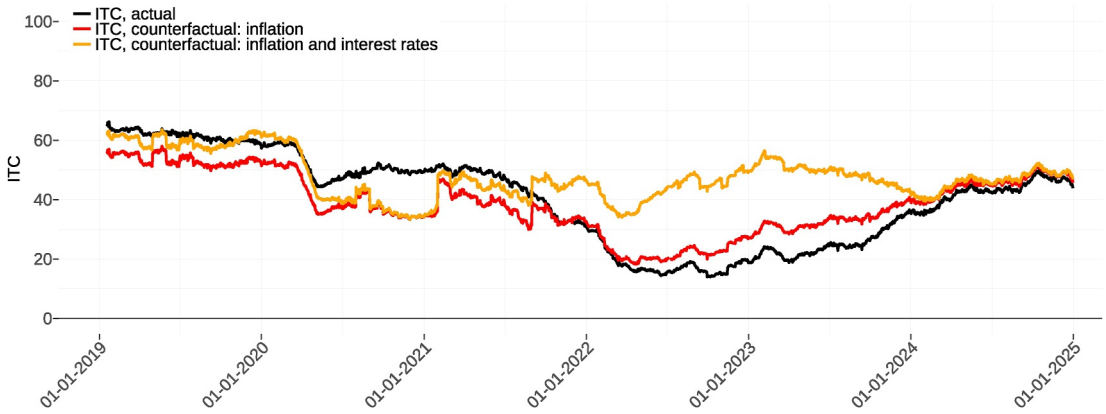

FIGURE 3 Actual and counterfactual inflation target credibility. This figure displays the actual degree of inflation target credibility *ITC* (black) together with the counterfactual series ITC^{π} and $ITC^{\pi,i}$ based on Equations (4) and (5). ITC^{π} (red) adjusts only for the estimated effect of deviations of inflation from target. $ITC^{\pi,i}$ (yellow) additionally accounts for deviations of the European Central Bank's policy rate from the Taylor rate.

3.4 | Robustness analysis

Our empirical analysis examines how the central bank's interest rate policy affects the credibility of its inflation target, assuming that consumers interpret this policy through the lens of a Taylor rule. However, even a simple Taylor rule could be too sophisticated from a consumer perspective. In particular, consumers do not observe, and thus probably do not account for the output gap. Therefore, we also consider the response of the credibility of the inflation target to interest rate rules that put zero weight on the output gap ($\phi_y = 0$). We also experimented with different weights (ϕ_π) on the deviation of inflation from the 2% target and a Taylor rule featuring a lagged interest rate term to allow for interest rate smoothing. Table A1 and Figure A1 show that the results are very robust with respect to the underlying interest rate rule.

The asymmetric ITC equations shown in Table 1 suggest that consumers may not fully appreciate the ECB's non-zero inflation target. Apparently, consumers always prefer a lower to a higher inflation rate with no regard to the actual target of 2%. Therefore, as an alternative to the asymmetric ITC equations proposed by Coleman and Nautz (2025), we consider a symmetric ITC equation using the level of inflation rather than its distance to 2%. The estimation results show a plausibly signed symmetric response of ITC to inflation (-0.045), see column (4) of Table 1. The estimated coefficient of the interest rate gap (-0.042) confirms a robust impact of interest rate policy on the credibility of the inflation target.

To ensure that our results are not driven by a counterintuitive response to inflation below the target, we follow a referee's suggestion and estimate the ITC equation excluding observations with inflation rates below 2%. The results, presented in column (5) of Table 1, show that this modification has no significant impact on the coefficient of the interest rate gap (-0.048). The robustness of the estimation results is also reflected in the counterfactual ITC series, see Figure B1 in Appendix B. Irrespective of the underlying ITC equation, inflation measure or Taylor rule, there is an economically significant impact of the interest rate gap on the credibility of the inflation target.

4 | CONCLUSION

Inflation targets can only be effective if they are credible, that is, if enough people expect that monetary policy will actually achieve the target. Drawing on survey data for German consumers from 2019 to 2024, we find that the time-varying degree of ITC depends not only on the prevailing rate of inflation but also on the interest rates set by the central bank. In particular, the marked decline in the credibility of the ECB's inflation target observed between 2021 and late 2023 could potentially have been attenuated through an earlier and more resolute tightening of monetary policy. Our survey measures the credibility perceived by consumers, not the actual one. In the same vein, the interest rates derived from various Taylor rules serve as proxies for the policy rate expected by the average consumer and need not be optimal from a monetary policy point of view, see Nakamura et al. (2025). However, in line with Tatar and Wieland (2025), our results indicate that simple outcome-based interest rate rules deserve more attention in the communication of the ECB's monetary policy strategy.

ACKNOWLEDGMENTS

Financial support from the German Research Foundation (DFG) through grant NA 365/8 and the Deutsche Bundesbank is gratefully acknowledged. Many thanks to Anatol Sluchych for the excellent research assistance. Helpful comments by Balint Tatar, Volker Wieland and an anonymous referee are gratefully acknowledged. Open Access funding enabled and organized by Projekt DEAL.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ENDNOTES

[1] In February 2020, the ECB launched its "ECB Listens Portal," encouraging the general public to express their views on a range of issues. More than half of the contributions were critical of the ECB's low interest rate policy, see European Central Bank (2021). A comparable consumer reaction is likely regarding the delayed response of the ECB to the inflation surge of 2022, see Tatar and Wieland (2025).

[2] Schmidt and Nautz (2012) and Bernardini and Lin (2024) find that even professional monetary analysts consider the Taylor rule as a starting point to assess the ECB's policy rate.

[3] For more details on the survey design and its external validity, see Coleman and Nautz (2025).

[4] The full list of demographics we control for in the empirical analysis further contains the consumer's job position, employment status, marital status, and a dummy variable to control for differences between East and West Germany. The results obtained for demographics are not presented but are available on request.

[5] Since the treatment variable π_t is constant in a given month, we clustered the standard errors accordingly, see Abadie et al. (2023).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Nautz, D. (2026) Inflation target credibility and the Taylor rule. *Contemporary Economic Policy*, 1–9. Available from: https://doi.org/10.1111/coep.70028

APPENDIX A

TABLE A1 Inflation target credibility: Alternative policy rules.

$$ITC_{it} = \alpha + \beta' X_i + \gamma^{+} |\pi_t - 2|^{+} + \gamma^{-} |\pi_t - 2|^{-} + \delta |i_t^* - i_t| + \varepsilon_{it}$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\lvert i_t^* - i_t \rvert$	**−0.044** (0.006)	**−0.040** (0.011)	**−0.048** (0.005)	**−0.068** (0.011)	**−0.054** (0.005)	**−0.074** (0.010)	**−0.053** (0.006)	**−0.042** (0.016)	**−0.096** (0.016)
$\lvert \pi_t - 2 \rvert^{+}$	**−0.026** (0.013)	**−0.046** (0.012)	−0.021 (0.012)	**−0.027** (0.012)	0.017 (0.012)	0.021 (0.016)	**−0.048** (0.010)	**−0.067** (0.011)	−0.024 (0.015)
$\lvert \pi_t - 2 \rvert^{-}$	**0.084** (0.025)	**0.096** (0.028)	**0.084** (0.024)	**0.085** (0.024)	**0.078** (0.020)	**0.147** (0.023)	**0.096** (0.024)	0.053 (0.031)	**0.081** (0.025)
r^*	0.5	−1.5	0.5	−1.5	0.5	−1.5	0.5	−1.5	0.5
ϕ_π	0.5	0.5	0.5	0.5	1	1	0	0	0.5
ϕ_y	0.5	0.5	0	0	0	0	0	0	0.5
ρ	0	0	0	0	0	0	0	0	0.7
R^2	9.4	8.6	9.6	9.1	9.9	9.5	9.6	8.5	9.0
Obs.	222,203	222,203	222,203	222,203	222,203	222,203	222,203	222,203	222,203

Note: $ITC_{it} = 1$ if consumer i answers C or B implying that the inflation target is seen as credible. $i_t^* = \rho i_{t-1}^* + (1-\rho)(r^* + \pi_t + \phi_\pi(\pi_t - 2) + \phi_y(y_t - y_t^*))$, where π_t is monthly Harmonized Index of Consumer Prices core inflation, r^* is the real rate, $(y - y^*)$ is the output gap, and ρ the interest rate smoothing parameter. Column (1) shows the results obtained for the benchmark Taylor rule. Bold font shows significance at the 5% level. For more information, see Table 1.

Figure A1

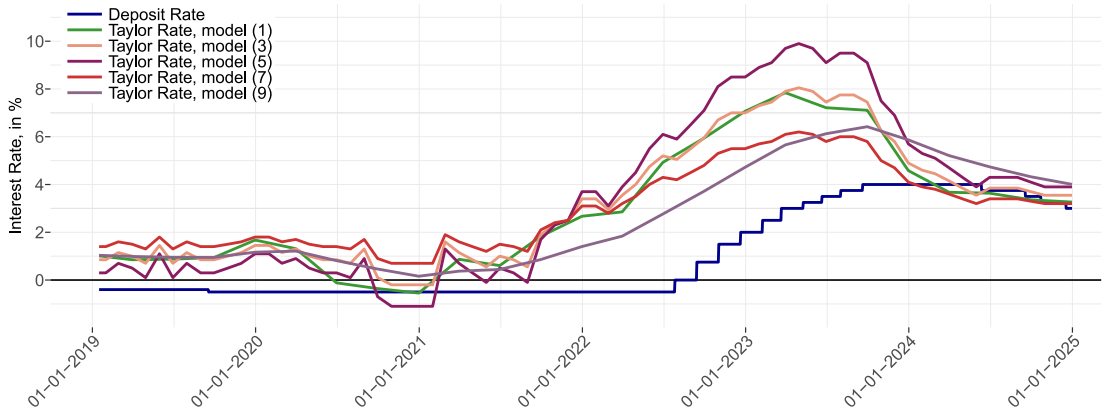

FIGURE A1 The ECB's policy rate and alternative interest rate rules. This figure shows the ECB's deposit rate and the policy rates implied by alternative policy rules based on Harmonized Index of Consumer Prices core inflation and $r^* = 0.5$, see Table A1. ECB, European Central Bank.

APPENDIX B

Figure B1

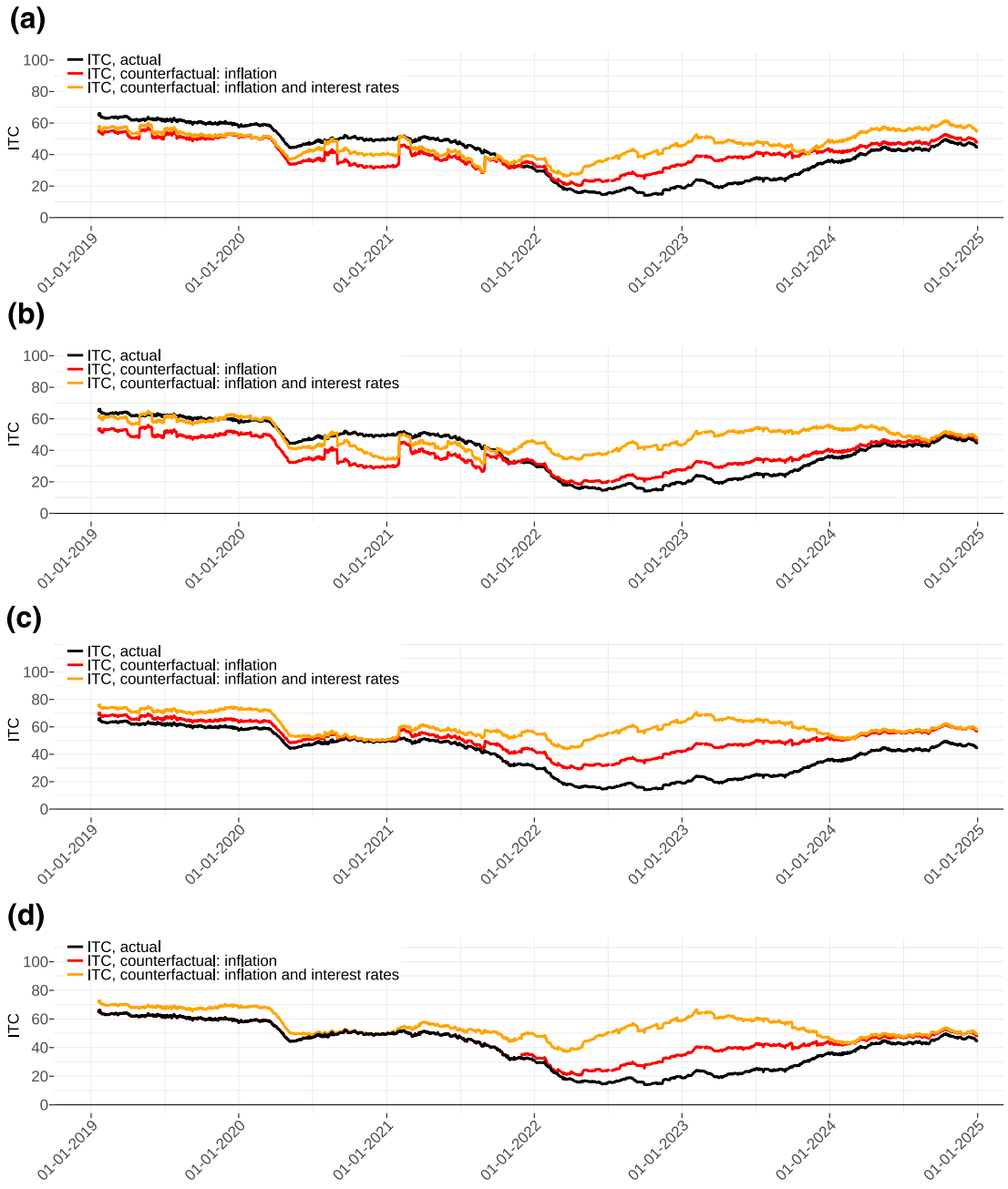

FIGURE B1 Counterfactual inflation target credibility: robustness analysis. (a) Counterfactual ITC with Harmonized Index of Consumer Prices-based Taylor rate and $r^* = -1.5$. (b) Counterfactual ITC with Gross Domestic Product-deflator-based Taylor rate and $r^* = 0.5$. (c) Counterfactual ITC with symmetric reaction to the level of inflation. (d) Counterfactual ITC without inflation rates below target. This figure displays the actual degree of inflation target credibility ITC together with the counterfactual series ITC^{π} and $ITC^{\pi,i}$ based on alternative specifications of the ITC equation, see Columns (2), (3), (4), and (5) of Table 1. ITC^{π} (red) adjusts only for the estimated effect of deviations of inflation from target. $ITC^{\pi,i}$ (yellow) additionally accounts for the interest rate gap. ITC, inflation target credibility.