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Maintaining the Anchor: An Evaluation of Inflation Targeting in the Face of COVID-19*

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Abstract

This paper provides evidence that inflation targeting delivered well-anchored inflation expectations during the post-2020 inflation surge. Using a macroeconomic model, we first illustrate how long-term nominal interest rates respond to an unexpected burst of inflation under both anchored and unanchored inflation expectations. Then, we evaluate these predictions using high-frequency financial market data from nine advanced economies. Specifically, we examine whether inflation expectations embedded in asset prices remained anchored as inflation climbed in the aftermath of the pandemic. Our results suggest that inflation expectations were just as well, or in some countries better anchored, after the pandemic. We show that this favorable outcome was broadly accompanied by perceptions of an aggressive monetary policy response to above-target inflation.

JEL Classification: E32, E52

Keywords: Monetary Policy, Inflation Expectations, COVID

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1 Introduction

The aftermath of the COVID-19 pandemic brought about the highest rates of inflation in advanced economies since the 1980's. However, unlike the high inflation of the 1980's, advanced economy central banks have since adopted inflation targeting frameworks, complemented by numerical inflation targets. When facing significant inflationary pressures, economic theory suggests that an inflation targeting framework delivers better macroeconomic outcomes by keeping inflation expectations well anchored. This paper studies whether inflation targeting worked as intended to keep inflation expectations from drifting amid the large inflation surge brought on by the COVID-19 pandemic and its aftermath.

Our paper begins with a simple macroeconomic model which informs and disciplines our empirical approach. The model features an inflation-targeting central bank in an environment where the inflation expectations of price-setting firms can be either anchored or unanchored. If anchored, long-term expectations for future inflation are determined solely by the central bank's target. If unanchored, expectations of future inflation can drift with recent inflation outcomes. In the model, we generate longer-term nominal bonds and show how they react to a burst of inflation in both the anchored and unanchored inflation expectations regimes. The key prediction emerging from the model is that returns on far-forward nominal assets become much more sensitive to inflation news when expectations are unanchored.

With this model prediction in hand, we empirically evaluate the degree of anchoring in nine advanced economies during the post-pandemic surge in inflation. For each country, we study the high-frequency response of far-forward nominal compensation to inflation data releases. Based on this test of anchoring, we find that longer-term inflation expectations were just as well, or in some countries better anchored, after the pandemic. The robustness of this finding across countries is somewhat remarkable given the differing initial conditions prior to the pandemic. For example, regardless of whether an economy experienced above- or below-target inflation before the onset of the pandemic, empirical evidence suggests that all countries in our study emerged from this inflationary episode with well anchored expectations. This evidence also suggests that cross-country differences in the implementation of inflation targeting, such as the use of point targets versus a range for inflation or the presence of other mandates, did not affect the performance of inflation targeting in delivering anchored inflation expectations.

Though outside the scope of the simple model that motivates our test of anchoring, we complement these empirical results with analysis as to how perceptions of central bank reaction functions shifted following the pandemic. This analysis connects our paper with other recent research documenting shifts in the Federal Reserve's perceived reaction function after 2020. As in Bocola et al. (2024), we find that the Fed was initially perceived as less reactive to inflation following the adoption of the Flexible Average Inflation Targeting (FAIT) framework in August 2020. We also find that as inflation climbed above target, the Federal Reserve was perceived as becoming more aggressive in combating inflation, consistent with work from Bauer, Pflueger and Sunderam (2024).

However, our analysis shows that the same pattern holds for other advanced economy central banks which did *not* change their inflation-targeting frameworks. In particular, financial market participants perceived most central banks in our sample as becoming less responsive to inflation after August 2020. Then, as inflation increased, these perceptions changed and expectations for short-term policy rates became more responsive to inflation. This cross-country evidence suggests that the Federal Reserve's adoption of FAIT and new strategy did not result in the Fed falling behind the curve, at least not more so than other central banks. Instead, our empirical evidence suggests that the Fed was like many other central banks in initially looking-through inflationary pressures early in the pandemic recovery but then responding more aggressively as inflation moved further from target.

2 Related Research

A substantial body of research studies the potential benefits that can accrue to society from having well-anchored inflation expectations (Bernanke et al., 1999). Textbook macroeconomic models suggest that firmly anchored inflation expectations can reduce the extent of above-target inflation in response to inflationary shocks and minimize the cost of disinflation. Orphanides and Williams (2004) shows that macroeconomic performance improves considerably when private-sector inflation expectations are anchored at the central bank's inflation target. Empirical work generally finds that, in practice, central banks can reap these gains by communicating a numerical inflation target. Most directly related to our work, Gürkaynak et al. (2007), Gürkaynak, Levin and Swanson (2010), Beechey, Johannsen and Levin (2011), and Bundick and Smith (2025) use cross-country evidence to show that, with few exceptions, communicating a numerical inflation target indeed made financial market measures of inflation expectations more stable in response to inflation surprises. These conceptual benefits, as well as the apparent success of inflation-targeting frameworks in practice, provide some rationale why inflation targeting became the predominant framework for central banks to achieve their price-stability mandates in the decades before the pandemic.

However, the surge in inflation following the COVID-19 pandemic was a stark break from the decades of inflation stability that preceded the pandemic. Our paper therefore builds directly on this prior work using similar methodologies to examine how inflation targeting performed under these more extreme inflationary conditions. Our results indicate that inflation targeting appears to have performed well in terms of preventing inflation expectations from drifting amid the large COVID-19 inflation surge.

Our paper is also related to another line of research examining the factors behind the post-2020 surge in inflation. Bernanke and Blanchard (2024) provides a particularly thorough analysis of the forces that drove up inflation across advanced economies, concluding that it was initially driven by relative price shocks but inflation persisted as labor markets tightened. Bernanke and Blanchard therefore suggest that an unanchoring of inflation expectations was not behind the rise in inflation, contrasting this episode from the 1970's.

Other research more directly attributes the COVID-19 surge in inflation to the conduct of monetary policy, particularly in the United States. Cieslak, McMahon and Pang (2024) argue that the Fed's August 2020 revamp of its monetary policy strategy and subsequent communications increased uncertainty about the Fed's reaction to inflation in the minds of the public. Orphanides (2024) documents deviations of interest rates in 2021 from historical policy rules may have contributed to the subsequent rise in inflation. Similarly, Romer and Romer (2024) argue that the Fed was slow to respond to rising inflation following the adoption of its new framework. Bocola et al. (2024) provide high-frequency financial market evidence to that effect, by showing that long-term nominal interest rates became less responsive to long-term inflation compensation after 2020, which they link to a reduction in the Federal Reserve's response to inflation following the adoption of FAIT. in contrast, Bauer, Pflueger and Sunderam (2024) show that in 2022, as inflation climbed further from target and the FOMC started to increase interest rates, the Federal Reserve was perceived as becoming much more responsive to inflation.

Among these works, our paper is most closely related in terms of methodology to Bocola et al. (2024) and Bauer, Pflueger and Sunderam (2024). However, our paper differs in the use of cross-country data from eight other inflation-targeting central banks as well as our focus on the degree to which financial markets perceived inflation expectations to be well anchored. As discussed in the Introduction, our findings echo the results of this prior research in terms of finding multiple shifts in the Fed's perceived reaction to inflation after 2020. However, we document similar shifts across many other central banks, suggesting that global and pandemic-related factors may explain the perceived shifts in reaction functions rather than the Fed's adoption of a new monetary policy strategy. Our analysis on the anchoring of inflation expectations further underscores that although financial markets perceived central banks to be less responsive to inflation early in the pandemic-inflation surge, a subsequent increase in responsiveness was largely sufficient to keep inflation expectations from unanchoring as inflation climbed further from target.

3 Testable Predictions in a Theoretical Model

Our primary goal is to empirically test whether long-term inflation expectations were well anchored following the COVID-induced inflation surge. In this section, we use a theoretical model to illustrate some testable predictions that an econometrician could implement to uncover if longer-term inflation expectations become unanchored following a burst of inflation. The model below draws heavily from prior work in Bundick and Smith (2025) but the model shares many features with other common macroeconomic models in the literature. For expositional purposes, we focus our presentation in the main text on the testable predictions regarding inflation and inflation expectations. Interested readers can find additional details of our theoretical model in the Appendix of Bundick and Smith (2025).

The key agents in our model are a representative household, a retail goods sector which produces differentiated products subject to nominal rigidities, an aggregation sector which aggregates the differentiated products into the final output, intermediate goods producers which hire labor in a frictional labor market, and a monetary authority which sets the short-term nominal interest rate. After aggregation, the model provides a framework which links inflation to labor market tightness, an intertemporal savings equation linking consumption and interest rates, and a forward-looking job creation curve. As in Bundick and Smith (2025), exogenous changes in household demand cause fluctuations in the economy which allows the model to generate a downward-sloping Phillips curve. We calibrate the model to quarterly frequency.

The key specification in our model is that longer-term inflation expectations can either be anchored at the central bank's target or they can be unanchored and drift with realized inflation outcomes. The following equation captures this idea:

$$\pi_t^{LT} = \rho^\pi \pi_{t-1}^{LT} + \Big(1 - \rho^\pi\Big)\pi^* + \delta^\pi \Big(\pi_t - \mathrm{E}_t \pi_{t-1}\Big), \tag{1}$$

where π_t^{LT} is the long-term inflation expectation in period t, π_t is the inflation rate, and π^* represents the central bank's inflation objective. The coefficient δ^π determines the degree to which long-term inflation expectations are anchored. If $\delta^\pi = 0$, then long-term inflation expectations are fully anchored meaning they are invariant to realized inflation and longer-term expectations coincide with the central bank's target. If instead $\delta^\pi > 0$, then inflation expectations are unanchored and drift with realized inflation. If $\delta^\pi > 0$, the parameter $0 \leq \rho^\pi \leq 1$ determines the persistence of the fluctuations in longer-term expectations in response to unexpected changes in current inflation.[1]

Figure 1 shows the effects of an unexpected and exogenous increase in household demand under both anchored and unanchored inflation expectations. Under anchored expectations, the increase in demand results in a short-lived increase in inflation. However, if longer-term expectations drift, the unexpected inflation today causes expectations about future inflation to move higher resulting in a highly persistent inflationary episode.[2] As implied by Equation (1), these responses highlight that the correlation between longer-term inflation expectations and unexpected inflation can be informative about the degree of anchoring.

An arithmetic manipulation of Equation (1) provides intuition on how an econometrician could estimate δ^π using a high-frequency event-study approach. Taking expectations of Equation (1) at time $t-1$ and subtracting it from Equation (1) delivers the expression:

$$\pi_t^{LT} - \mathbb{E}_{t-1}\pi_t^{LT} = \delta^\pi(\pi_t - \mathbb{E}_{t-1}\pi_t), \tag{2}$$

where the left-hand side measures revisions to long-term inflation expectations, the right-hand side captures the news about current inflation revealed between time $t-1$ and t, and the coefficient δ^π governs how that inflation news affects long-term inflation expectations. Equation (2) suggests that we can estimate δ^π by regressing the change in long-term inflation expectations on the surprise or unexpected component of domestic inflation reports. A positive and statistically significant δ^π suggests that inflation expectations are unanchored

[1]In this paper, we remain agnostic about the microfoundations of Equation (1) and instead focus on the testable implications of anchoring inflation expectations. Previous work by Ireland (2007), Gürkaynak, Sack and Swanson (2005), Rudebusch and Wu (2008), and Rudebusch and Swanson (2012), also use similar specifications in modeling longer-term inflation expectations.

[2]We set $\delta^\pi = 0.29$ which is in line with previous empirical evidence in Bundick and Smith (2025).

and drift with realized inflation outcomes.

In practice, directly estimating Equation (2) is not feasible since longer-term inflation expectations are unobserved, at least at a high frequency. Therefore, following the approach of prior research, we proxy the revisions to long-term inflation expectations using the one-period change in far-forward nominal compensation in financial markets. Ideally, we prefer to use far-forward inflation breakevens —measured as the difference between nominal and inflation-indexed government bonds (such as the TIPS market in the US) of the same maturity — to infer changes in longer-term inflation expectations.

However, most countries in our study do not have an active inflation-linked debt market, therefore, we often rely on far-forward nominal interest rates. While these yields have both a nominal and real component, we can assume that the primary information revealed around an inflation release would inform inflation expectations rather than far-forward real yields. Following Gürkaynak, Sack and Swanson (2005), we demonstrate this idea in our macroeconomic model by showing that we can infer changes in δ^π by estimating a version of Equation (2) using high-frequency changes in either model-generated 10-year (40-quarter) forward inflation breakevens (π_t^{40}) or 10-year nominal forward rates (r_t^{40}),

$$\pi_t^{40} - \pi_{t-1}^{40} = \delta^\pi(\pi_t - \mathbb{E}_{t-1}\pi_t), \tag{3}$$

$$r_t^{40} - r_{t-1}^{40} = \delta^\pi(\pi_t - \mathbb{E}_{t-1}\pi_t). \tag{4}$$

The bottom row of Figure 1 highlights the responses of these forward rates to the unexpected increase in demand. The results suggest that, even without ideal measures of inflation expectations, nominal forward rates can be informative about the underlying parameter δ^π.

We now show that, even in a small sample of the size we will encounter in our empirical COVID samples, high-frequency regressions of the form in Equations (3) and (4) could recover changes in δ^π *if they occurred*. For this experiment, we first assume that, with the adoption of an inflation targeting framework, the central bank was able to anchor expectations. Thus, we set $\delta^\pi = 0$ and simulate the economy for 111 periods (the length of our pre-COVID empirical sample for the US). Then, we assume that the COVID-induced burst of inflation causes inflation expectations to become unanchored ($\delta^\pi = 0.29$) for the next 33 periods. Table 1 shows the estimates of a high-frequency regressions using Equations (2), (3), and (4) across these two sample periods as well as a formal break test in the δ^π coefficient.

Even without perfectly observing longer-term inflation expectations, Table 1 shows that an econometrician could detect a change in the degree to which inflation expectations are well anchored if such a change occurred. The first column shows that, if we could perfectly observe longer-term inflation expectations, then we could exactly recover the true value δ^{π} and detect a break in the coefficient even in a short sample period of only about 30 observations. More importantly, the formal break tests show that we can also detect a break even using an imperfect measure of longer-term inflation expectations. These results shows that these high-frequency regression can be useful to assess changes in the degree of anchoring over time even in small samples.

4 Empirical Analysis of Inflation Targeting During the COVID-19 Inflation Surge

Building on the predictions of our model, we now turn to financial market data to measure the degree of anchoring across advanced economies pre- and post-pandemic. Despite numerous differences across the economies we study, a common finding emerges from our analysis of inflation-targeting central banks: Inflation expectations appear to be just as well or, in some cases, better anchored following the COVID-19 inflation surge. We first review the panel of countries we study and briefly summarize some of the differences across each central bank's approach to inflation targeting before presenting our estimates of the degree of anchoring before and after the COVID-19 inflation surge.

4.1 Sample Selection and Data

Our sample of economies consists of nine advanced-economy inflation targeting central banks.[3] The economies we study were selected based on three criteria: (i) Their central banks follow some form of an inflation targeting framework with a numerical inflation target, (ii) There is a sufficiently liquid financial market instrument to measure forward nominal interest rates or inflation compensation in the domestic economy at a daily frequency, and (iii) There is a sufficiently large Bloomberg panel of forecasters which submit forecasts for domestic inflation releases. The following countries meet our criteria:[4]

[3]Many emerging market economies also follow inflation-targeting frameworks. However, exchange rate considerations and capitals flows are more prominent for many emerging market economies, and the degree of central bank independence varies considerably across emerging market central banks.

[4]One notable exception not included in our analysis is the Euro Area. The ECB has an explicit inflation targeting framework and there is a large panel of Bloomberg forecasters which submit forecasts for Euro

1. US: United States
2. UK: United Kingdom
3. JP: Japan
4. CA: Canada
5. SE: Sweden
6. CH: Switzerland
7. NO: Norway
8. AU: Australia
9. NZ: New Zealand

All the central banks in our sample follow an inflation-targeting framework with a numerical target in the vicinity of 2 percent. However, the details of their frameworks differ considerably from one another. Table 2 provides a high-level summary of the differences that underlie each central bank's inflation targeting framework. For example, the 2 percent targets differ in terms of whether 2 percent represents a point target, the central point of a range, or if 2 percent is a ceiling or floor on desired inflation outcomes. Moreover, these central banks often have other objectives in addition to inflation. Of the nine central banks we study, only the Bank of Japan is a single-mandate central bank with the sole remit being price stability. Instead, the majority of countries in our sample take a "flexible" approach to inflation targeting to allow for temporary and modest deviations of inflation from target in order to accommodate other considerations, such as employment or economic growth. The importance of these other mandates varies across countries. For some central banks, price stability is elevated among other considerations whereas, for other central banks, price stability is given equal importance to other mandates.

Despite these differences in inflation targeting frameworks, the commonality of the inflation surge after 2020 led to a shared focus on price stability across all of these inflation-targeting central banks. Figure 2 documents the often-cited fact that the post-2020 inflation surge marked the highest inflation rates in decades. Table 3 further quantifies the extent to which inflation exceeded each central bank's respective inflation target. Prior to 2020,

Area inflation; however, there is no financial market instrument over a sufficiently long sample to measure forward nominal interest rates or forward inflation compensation across the Euro Area.

central banks were generally effective at delivering inflation near their targeted level. This apparent success was challenged in the aftermath of the pandemic. Inflation peaked somewhere between 3.4 percent (Switzerland) to as high as 10.2 percent (Sweden).[5]

In the following section, we empirically test how well inflation targeting performed in anchoring inflation expectations in the face of persistently above-target inflation. As in our model in Section 3, our empirical measure of anchoring is the estimated sensitivity of long-term nominal forward compensation to inflation news. Before presenting our findings, we briefly discuss the construction of the data used to test the degree of anchoring. More complete details of the data for each country are listed listed in Table 4.

For most countries, the nominal forward rate measure is based on implied forward rates across sovereign (zero-coupon) yield curves. Only the United States and the United Kingdom have actively traded inflation-protected securities, which is our preferred and more direct measure of inflation expectations priced into financial markets.[6] However, our model predictions in Section 3 underscore that nominal forward interest rates, as well as forward inflation compensation, will become more responsive to inflation news when inflation expectations are not well anchored.[7] We most often work with the 1-year, 9-year forward horizon which is sufficiently long to ensure that persistent inflation shocks fade. Though, in some cases, data limitations led us to work with 3-year, 7-year forward rates or 5-year, 5-year forward rates.

We interpret the model analogue of inflation news, defined in our model as "unforecasted" inflation, as the surprise component of domestic inflation releases. The inflation surprises are constructed as the difference between the as-reported inflation number and the median forecast across the panel of Bloomberg forecasters.

[5]Japan is a bit of an outlier in that inflation was running persistently below target before 2020 despite considerable efforts from the Bank of Japan to raise inflation to 2 percent. As we will see in our empirical analysis, unlike all the other central banks we study, the increase in inflation in Japan following the pandemic was largely accommodated by the Bank of Japan after years of below-target inflation.

[6]For the UK, these gilts are linked to the RPI, which is not the measure we study for the inflation surprise due to the lack of survey coverage. Since the RPI and CPI data are released on the same day in the UK, we chose to work with nominal forward gilt yields for the U.K.

[7]This result builds on work by Gürkaynak, Sack and Swanson (2005) who also study the response of longer-term interest rates to economic news and demonstrate that, in standard models, less than perfectly anchored inflation expectations can drive movements in far-forward interest rates.

We select the inflation release to study based on the number of forecasts submitted to ensure sufficient survey coverage and to maximize the amount of inflation news. For most countries, this implies that year/year inflation is used to measure surprise based on survey coverage, even though month/month inflation would provide greater (marginal) news content. Similarly, core measures of inflation that exclude volatile energy and food prices would be preferred to maximize the signal of the surprise for underlying inflation dynamics. However, in several instances, headline inflation measures have broader survey coverage and allow for an earlier start to the estimation sample. It is also worth noting that the inflation surprise measure may not necessarily align with the inflation rate targeted by the central bank. For example, in the US, the Federal Reserve has specified its target for inflation in terms of PCE inflation. However, CPI data is released well-ahead of the PCE data and contains much of the same price information. Therefore, the majority of "inflation news" in the United States is concentrated in the CPI release.[8]

By construction, these inflation surprises are (ex-ante) unforecastable, and therefore are orthogonal to far forward nominal interest rates and inflation compensation prior to the inflation release. Therefore, in the regression analysis that follows, we study the one-day change in long-term nominal forward compensation on the day of these domestic inflation releases to measure the effect of inflation news on longer-term inflation expectations.[9]

4.2 Estimates of Anchoring Across Advanced Economies

We empirically measure the degree to which inflation expectations remained anchored by estimating the sensitivity of longer-term nominal compensation to inflation news. We measure this sensitivity empirically by regressing the one-day change in nominal forward compensation on the surprise component of domestic inflation releases:

$$\Delta y_t^{10yr,forward} = \delta^0 + \delta^\pi \, \pi_t^{surprise} + \varepsilon_t, \tag{5}$$

where $y_t^{10yr,forward}$ is a measure of long-term nominal forward compensation always based on a 10-yr tenor, $\pi_t^{surprise}$ is the surprise component of the economy's inflation release based on Bloomberg forecasts, and ε_t is a regression residual. We estimate Equation (5) on the days

[8]Moreover, the Treasury Inflation Protected Securities we use to measure forward inflation compensation in the United States are indexed to CPI rather than PCE.

[9]This also requires that the inflation surprise does not reveal information on long-term real fundamentals. This is one reason we prefer to focus on inflation releases as opposed to other popular data releases, such as employment or GDP releases which are more likely to contain information about trends in real variables and future productivity.

that the domestic price data is released, country by country, using OLS. Inference is based on heteroskedasticity-robust standard errors. The estimated coefficient, denoted by $\widehat{\delta^{\pi}}$, is our measure of the the sensitivity of nominal forward compensation to inflation news and, hence, is our empirical measure of anchoring. We estimate the degree of anchoring in split samples, pre-COVID and during the COVID period inflation surge.

Figure 3 shows our main result, that across economies longer-term inflation expectations remained just as well, or even better anchored during the COVID-19 inflation surge. The chart shows estimates of δ^{π} from Equation (5) over the pre-COVID sample in blue circles and the COVID period in red squares.[10] The vertical whiskers denote 90 percent confidence intervals. For each country, the COVID sample confidence intervals include zero, indicating no statistically significant evidence of pass through from inflation surprises to longer-term nominal forward compensation. By this measure, the COVID sample estimates indicate that inflation expectations were well anchored during the COVID inflation surge.

Our COVID samples are small which could lead to wide confidence bands and low power to reject the hypothesis that $\delta^{\pi} = 0$. While our model simulations in Section 3 suggest that we should be able to detect an increase in δ^{π} if one occurred, even in a small sample, there could be factors outside of our theoretical model that make the actual data noisy and the estimates less precise. Nevertheless, we should still observe an increase in the point estimates of δ^{π} if expectations became unanchored. However, Figure 3 shows there is little evidence of a uniform increase in the point estimates of δ^{π} during the COVID period. Only in four of the nine countries is the COVID estimate of δ^{π} larger than the pre-COVID estimate, and only meaningfully higher in Switzerland (CH). Perhaps most striking is the indication that in some countries inflation expectations became better anchored. For example, the point estimate of δ^{π} declined from pre-COVID to the COVID sample in five of the nine countries we study.

We use structural break tests to more formally measure how the sensitivity of long-term nominal compensation changed during the COVID inflation surge. Table 5 shows results of a Chow (1960) test for a change in the coefficient δ^{π} with the candidate break date specified for most countries when inflation breached the central bank's target.[11] We implement the break

[10] The start of the pre-COVID period is determined by country-specific details of their inflation targeting regime and the availability of data. The pre-COVID period ends for all countries except Japan when inflation climbed above the central bank's target. See Table 4 for details on the sample dates.

[11] The breakdate for Japan is set to when inflation moved into positive territory.

test with a COVID period inflation dummy that is interacted with the inflation surprises. The results in Table 5 show the estimated coefficient δ^{π}_{COVID} from the following regression model, estimated over the full sample for each country:

$$\Delta y_t^{10yr,forward} = \delta^0 + \delta^0_{COVID} + \delta^{\pi}\,\pi_t^{surprise} + \delta^{\pi}_{COVID}\,\pi_t^{surprise} \times \mathcal{I}_{COVID} + \varepsilon_t. \tag{6}$$

The results of these break tests suggest that in no economy did inflation expectations become unanchored during the COVID inflation surge. In fact, in some economies, we find evidence that inflation expectations became *better* anchored during the COVID period. In the United Kingdom, Japan, and Norway, there is evidence that inflation expectations were not especially well anchored before the pandemic; the estimate of δ^{π} is positive and statistically significant pre-COVID. However, we estimate a decline in δ^{π} in all three countries after mid-2021. While the evidence of a decline in the δ^{π} coefficient is not statistically significant, the decline in the point estimates nevertheless points to better — rather than worse — anchored inflation expectations by the end of 2023.

4.3 Sensitivity Analysis of Anchoring Results

Before turning to our interpretation of this finding, we show that the empirical results are largely insensitive to a number of reasonable changes in the regression specification. First, we examine an alternative breakdate, set universally across countries to March 2020 which more closely marks the global start of the pandemic. Second, we control for energy price changes to account for the fact that energy prices have been linked to market-based measures of inflation compensation by prior research (Hammoudeh and Reboredo, 2018; Perez-Segura and Vigfusson, 2016; Elliot et al., 2015). Moreover, some of the countries we study are significantly exposed to energy prices, either because energy is a large share of national economic activity (e.g. Norway) or through a large foreign energy dependence. And third, we examine the sensitivity of our estimate of δ^{π} to outliers by estimating the regression model using LAD rather than OLS. Table 6 presents the results of our sensitivity analysis.

The durability of the inflation anchor amid the COVID-19 inflation surge is a fairly robust empirical finding across 8 of the 9 economies we study. Switzerland is the only country whose anchoring results are somewhat sensitive to these perturbations. Focusing on Switzerland, the estimate of δ^{π} is not statically significant in the COVID sample in the baseline regression model, nor is it significant in any of the three alternative regression specifications. However, the estimates and statistical significance of the break in δ^{π} post-pandemic depend somewhat on the specification. Specifically, the increase in the estimate of

δ^{π} is not statistically significant in the baseline specification, nor in the universal breakdate specification. However, the increase in the estimate of δ^{π} during the COVID sample is larger and statistically significant in the regression specification that controls for energy price changes on the day of the release, as well as in the LAD regression specification that is less sensitive by outliers. However, it is worth emphasizing that Switzerland has the shortest COVID sample (relative to the pre-COVID sample) due to the timing of when inflation breached the Swiss National Bank's 0-2 percent inflation band.[12] Therefore, it remains to be seen if these mixed signs of unanchoring in Switzerland survive over a slightly longer sample.

4.4 How Our Estimates of Anchoring Compare With Prior Research

Our empirical methodology is designed to study whether inflation expectations were anchored during the COVID-19 inflation surge. However, our regression specification builds directly on prior work that also sought to measure the degree to which longer-run inflation expectations were anchored by measuring the high-frequency responses of nominal forward compensation to data surprises. Moreover, several of the countries we examine in this paper were also studied in the previous literature, which provides an opportunity to compare our high-frequency regression results over the pre-pandemic period to prior estimates of anchoring.

For the United States, Gürkaynak, Levin and Swanson (2010) found that 1yr9yr forward inflation compensation responded to high frequency data releases prior to 2005, suggesting that longer-term inflation expectations were not especially well anchored. Beechey, Johannsen and Levin (2011) use inflation swaps data to similarly show that from 2003 to 2007 far forward inflation compensation responded to high-frequency data surprises. Bundick and Smith (2025) further show that 1-year, 9-year forward inflation compensation responded to CPI inflation surprises before 2012, but ceased to respond after 2012 which is when the Federal Reserve adopted its 2 percent numerical inflation target.[13] The results in this paper build on this prior work by providing evidence that inflation targeting has maintained its anchoring effect on longer-run inflation expectations in the United States.

[12] Switzerland's COVID sample amounts to just 8% of the full sample, the smallest percentage for any country we study.

[13] Bundick and Smith (2025) also show that, by this measure, U.S. inflation expectations appeared to remain well anchored in the early years of the pandemic but their sample ended well before the totality of the inflation surge had been realized.

Results for the U.K. were provided previously in Gürkaynak, Levin and Swanson (2010), which argues that long-term inflation expectations were well anchored after May 1997 when the Bank of England was granted operation independence from the Chancellor of the Exchequer. In particular, these authors find that from May 1997 through December 2005, far-forward inflation compensation (1-year, 9-year forwards) in the U.K. ceased to respond to RPIX inflation surprises. Our baseline results in Figure 3 and Table 5 however suggest that far forward nominal rates responded to CPI surprises in the UK from January 2004 to May 2021. We attribute our contrasting results to the sample periods rather than the different measures of inflation surprises or far forward nominal compensation. In December 2003, the Chancellor of the Exchequer announced that the inflation target would subsequently be set in terms of CPI inflation and changed from 2.5 percent to 2 percent. However, as King (2004) noted, this effectively raised the inflation target by 25 basis points since RPIX had been running about 75 basis points above CPI, which may have called into question the stability of the central bank's inflation target. Our sample also includes the Global Financial Crisis as well as Brexit, the 2016 departure of the UK from the European Union, which resulted in a depreciation of the British pound and subsequent inflationary pressures that pushed inflation above target.

We perform additional analysis to verify our conjecture that inflation expectations became less well anchored in the U.K. between 2004 and 2021 and then more strongly anchored during the pandemic inflation surge. In particular, we estimate our regression model in Equation (5) using RPIX surprises instead of CPI surprises, which allows us to estimate the degree of anchoring back to Sep 1998. Table 7 shows resulting estimates of δ_π from Sep 1998 to Dec 2003, Jan 2004 to May 2021, and from June 2021 to Dec 2023. The results in Table 7 show that we can essentially match the findings from Gürkaynak, Levin and Swanson (2010) in so far as inflation expectations looked to be well anchored in the U.K. from 1998 through 2003. However, from 2004 through May 2021, the RPIX surprises confirm what we found with the CPI surprises in the baseline regressions, that inflation expectations were not as well anchored over the Pre-COVID sample. Finally, for completeness, the last column of Table 7 shows that the RPIX surprise specification also confirms the improved anchoring of U.K. inflation expectations in the COVID sample. Therefore, over similar samples, our results are broadly consistent with those reported in Gürkaynak, Levin and Swanson (2010) for the U.K.

Gürkaynak, Levin and Swanson (2010) also provide evidence that inflation expectation in Sweden were well anchored before 2006. Coverage of our sample for Sweden begins in 2009, but we find evidence of continued anchoring in that country through the pre-pandemic period, and maintenance of that anchoring through the pandemic. Similarly, Gürkaynak et al. (2007) provides evidence that inflation expectations in Canada were fairly well anchored from 1998 to 2005. These authors show that domestic CPI data releases did not systematically influence far forward nominal interest rates or inflation compensation in Canada. Our pre-pandemic sample for Canada also begins in 1998, and our estimates for Canada in Figure 3 and Table 5 confirm that over a longer sample extending through early 2021, longer-term inflation expectations in Canada were well anchored, extending the results previously reported in Gürkaynak et al. (2007).

Finally, for Japan, Bundick and Smith (2025) provide evidence that the Bank of Japan's (BOJ) announcement of a numerical 2 percent inflation target in 2013 did not anchor inflation expectations as of 2019. Our results here extend the sample period studied in this prior work and find evidence that expectations remained unanchored through early 2021 in Japan. However, the point estimates from Bundick and Smith (2025) suggest improved anchoring in Japan through 2019, albeit not statistically significant. Similarly, De Michelis and Iacoviello (2016) provided early evidence that the BOJ's efforts from 2013 were showing early signs of progress in stabilizing inflation expectations nearer to the Bank's target. The results in Figure 3 and Table 5 for the post May 2021 sample provide evidence that the BOJ's efforts have gained further traction in better anchoring inflation expectations in Japan. Though the break is not statistically significant, the point estimate for δ^{π} declines and is statistically insignificant in the COVID sample.

4.5 How Perceived Policy Reaction Functions Shifted

Our analysis of anchoring suggests that inflation targeting central banks were generally successful in preventing inflation expectations from unanchoring amid the COVID inflation surge. We now show that this favorable outcome was accompanied by perceptions of a more aggressive response of policy rates to inflation. In our model in Section 3, the responsiveness of the central bank to inflation deviations is determined by the parameter ϕ_π in the monetary policy rule:

$$r_t = \phi_r r_{t-1} + \phi_\pi \left(\pi_t - \pi^{LT_t}\right), \tag{7}$$

where r_t is the one-period nominal bond rate.[14]

[14] The long-run response to inflation is $\phi_\pi/(1-\phi_r)$, and therefore is also a function of ϕ_r. In the empirical estimation that follows, our estimates will focus on the high-frequency changes in expected future interest rates, which could be a function of both ϕ_π and ϕ_r.

While anchoring in our simple model is not explicitly tied to the responsiveness of monetary policy to inflation, other models with information rigidities have linked the degree of anchoring to the responsiveness of the central bank to deviations of inflation from target (Erceg and Levin, 2003; Orphanides and Williams, 2004; Jorgensen and Lansing, 2019; Beaudry, Carter and Lahiri, 2023). In other words, δ_π may depend on perceptions of ϕ_π. The analysis in this section therefore provides an interpretation for the perhaps surprising result that even central banks with less than perfectly anchored expectations before the pandemic emerged with well anchored expectations following the pandemic inflation surge. The analysis in this section also connects our research to other work that has documented shifts in the Federal Reserve's perceived responsiveness to inflation following the August 2020 framework change and subsequent inflation surge.

Our regression analysis builds on the anchoring specification in Equation (5) by replacing far-forward nominal rates with a measure of market-based expected short-term interest rates over the next 1-2 years. Specifically, we regress the one-day change in Overnight Interest Swap (OIS) rates on the surprise component of domestic inflation releases:

$$\Delta y_t^{n-yr,OIS} = \phi_0 + \phi_\pi \pi_t^{surprise} + \varepsilon_t, \tag{8}$$

where $y_t^{n-yr,OIS}$ is a 1- or 2-year OIS rate, depending on data availability. As in Equation (5), $\pi_t^{surprise}$ is the surprise component of the economy's inflation release based on Bloomberg forecasts, and ε_t is a regression residual. We estimate Equation (8) on the days that the domestic price data is released, country by country, using OLS. The estimated coefficient $\widehat{\phi_\pi}$ is our measure of the perceived reaction of the central bank to inflation. As with the anchoring equation, we estimate the central bank's perceived reaction to inflation in split samples, pre-COVID and during the COVID period inflation surge. Table 8 provides full details of the data and samples used.

Figure 4 shows that perceptions of the central bank's response to inflation generally shifted higher during the COVID inflation surge. The chart shows estimates of ϕ_π from Equation (8) over the pre-COVID period in blue circles and the COVID period in red squares.[15] The vertical whiskers denote 90 percent confidence intervals. Unlike every other country in our sample, the pandemic increase in inflation was accommodated in Japan with essentially no tightening in policy given that inflation had been stubbornly below target

[15]The start of the pre-COVID period is determined by country-specific details of their inflation targeting regime and the availability of data. The pre-COVID period ends for all countries except Japan when inflation climbed above the central bank's target. See Table 8 for details.

in Japan prior to the pandemic. For all central banks except Japan, the perceived policy response increased after inflation climbed above target. Table 9 shows that the increase in the reaction of interest rate futures to inflation is statistically significant in four of the nine countries we study, including the U.K., Switzerland, Australia, and New Zealand.

These policy response provide one way to rationalize the evidence that inflation expectations remained just as well, if not better anchored following the COVID-19 inflation surge. In particular, after years of relatively stable inflation pre-pandemic, the surge in inflation after 2020 allowed central banks to demonstrate their commitment to their inflation targets. In many countries, central bank officials signaled that aggressive interest rate increases during the COVID-19 inflation surge were carried out to keep inflation expectations well anchored.[16] The combination of our anchoring and policy response estimates supports this reasoning and suggests that the decisive actions of central banks around the globe were broadly sufficient to keep inflation expectations from drifting despite persistently high inflation.

Our estimates of a more aggressive central bank stance towards inflation after 2020 may appear to be at odds with other research suggesting that the Federal Reserve's response to inflation was reduced after the adoption of Flexible Average Inflation Targeting (FAIT). In particular, Bocola et al. (2024) use high-frequency data on nominal Treasury securities and inflation breakevens to show that the Fed was initially perceived as less reactive to inflation following the adoption of the FAIT framework in August 2020. And other researchers reached similar conclusions using different methods (Orphanides, 2024; Romer and Romer, 2024). To reconcile our findings with this prior research, we estimate the following regression model *for each country*:

$$\Delta y_t^{n-yr,OIS} = \phi_\pi \pi_t^{surprise} + \phi_{\pi,FAIT}\, \pi_t^{surprise} \times \mathcal{I}_{FAIT} + \phi_{\pi,COVID}\, \pi_t^{surprise} \times \mathcal{I}_{COVID} + \varepsilon_t, \quad (9)$$

where $\mathcal{I}_{FAIT}$ takes a value of one after August 2020 and, as above, $\mathcal{I}_{COVID}$ takes a value of one for most countries when inflation exceeds their target (constants are included, but suppressed from the notation). Recall that FAIT was only adopted in the United State in August of 2020. Therefore, testing for a structural break in August of 2020 in countries that

[16]See, for example, Federal Reserve Chairman Jerome Powell's June 2022 Press Conference Remarks, "Since then, inflation has again surprised to the upside, some indicators of inflation expectations have risen, and projections for inflation this year have been revised up notably. In response to these developments, the Committee decided that a larger increase in the target range was warranted at today's meeting. This continues our approach of expeditiously moving our policy rate up to more normal levels. And it will help ensure that longer-term inflation expectations remain well anchored at 2 percent." Available at: https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20220615.pdf

did *not* change their inflation-targeting frameworks serves as a placebo test of sorts for the hypothesis that the Federal Reserve's new framework for monetary policy resulted in a more passive response of the Fed to inflation.

Table 10 shows evidence that the perceived response of the central bank to inflation declined in every country after August 2020, with the decline being statistically significant in six out of nine countries. Then, once inflation climbed above target, every central bank with the exception of Japan was perceived as becoming much more responsive to inflation. The commonality in these shifts across central banks suggests that pandemic-related factors may explain the perceived shifts in reaction functions rather than the Fed's adoption of the FAIT framework. Instead, the Fed appears to be like virtually all other central banks in initially looking through the post-pandemic increase in inflation before turning much more aggressive as inflation moved persistently above target.

5 Conclusions

The COVID-19 pandemic lifted inflation in many countries to levels last seen in the Great Inflation of the 1970's and 1980's. One lesson from this Great Inflation episode was the importance of maintaining well-anchored inflation expectations in order to limit the economic cost of disinflation. Otherwise, a repeat of the unanchoring of inflation expectations that is believed to have occurred in the Great Inflation could have again resulted in a much more painful and prolonged disinflation. However, the results in this paper suggest that advanced-economy, inflation-targeting central banks were generally able to prevent inflation expectations from drifting during the post-2020 surge in inflation. By doing so, inflation has come down without a significant increase in unemployment in most economies. Looking ahead, our cross-country findings from this episode have important implications for the design of central bank frameworks. In particular, despite different initial conditions as well as differences in each country's approach to inflation targeting, we find that having a numerical inflation target and taking actions through current and expected policy rates as inflation moved away from the target appear to be common elements across countries that helped to prevent inflation expectations from drifting.

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Table 1: Testable Predictions of Unanchoring Inflation Expectations in Theoretical Model

	Model Simulations Δ Long-Term Inflation Expectations			**Model Simulations** Δ 10-Year Inflation Forward			**Model Simulations** Δ 10-Year Nominal Forward		
	Pre-Pandemic	COVID	Full Sample	Pre-Pandemic	COVID	Full Sample	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	-0.00	0.29^{***}	-0.00	-0.00^{***}	0.20^{***}	-0.00^{***}	0.00^{***}	0.20^{***}	0.00^{***}
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.29^{***}			0.20^{***}			0.20^{***}
			(0.00)			(0.00)			(0.00)
Observations	111	33	144	111	33	144	111	33	144

We show bootstrapped standard errors using model-simulated data. Each regression includes a constant but is always estimated to be numerically close to zero. See Section 3 for more details. $^{*}p < 0.10, ^{**}p < 0.05, ^{***}p < 0.01$

Table 2: Differences in Inflation Targeting Frameworks Across Countries

Country	Inflation Target	Measure	Other Mandates
United States	2%[1]	PCE	Maximum employment
United Kingdom	2%	CPI	Strong, sustainable and balanced growth giving priority to price stability
Japan	2%	CPI	
Canada	2% (+/-1%)[2]	CPI	Maximum sustainable employment
Sweden	2%	CPIF	Balanced development of output and employment giving priority to price stability
Switzerland	0%-2%	CPI	Resolve conflicts between price stability and business cycle considerations giving priority to price stability
Norway	2%	CPI	High and stable employment giving priority to price stability
Australia	2%-3%	CPI	Maintenance of full employment, economic prosperity and welfare
New Zealand	2% (+/-1%)[2]	CPI	Maximum stable employment, targets inflation "over the medium term"

[1] Since August of 2020, the Federal Reserve has followed Flexible Average Inflation Targeting, which the FOMC describes as the following: "In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."

[2] While a level of 2% inflation is preferred, care can be given to employemnt while inflation is in the control range of 1% to 3%.

Table 3: COVID-19 Inflation Experiences by Country

Country	Measure	Inflation Target	Average Precovid	Post-2020 Peak	Dec 2023
United States	PCE	2%	1.38%	7.12%	2.62%
United Kingdom	CPI	2%	2.09%	9.58%	4.21%
Japan	CPI	2%	0.89%	4.28%	2.59%
Canada	CPI	2% (+/-1%)	1.80%	8.10%	3.37%
Sweden	CPIF	2%	1.73%	10.16%	2.29%
Switzerland	CPI	0%-2%	0.49%	3.42%	1.74%
Norway	CPI	2%	1.70%	6.98%	5.51%
Australia	CPI	2%-3%	2.47%	7.83%	4.05%
New Zealand	CPI	2% (+/-1%)	2.43%	7.38%	4.66%

Table 4: Data Details by Country: Testing for Anchoring

Country	Nominal Forward Rate	Inflation Surprise	Sample Dates	Covid Break Date[4]
United States	1y9yf Infl Comp[1]	Core CPI MoM	Jan 2012 - Dec 2023	Apr 2021
United Kingdom	1y9yf Govt Yield	CPI YoY	Jun 2003 - Dec 2003	Jun 2021
Japan	1y9yf Govt Yield	CPI ex Fresh Food YoY	Sep 2001 - Dec 2023	May 2021
Canada	1y9yf Govt Yield	CPI YoY	Aug 1998 - Dec 2023	May 2021
Sweden	3y7yf Govt Yield	CPIF YoY[2]	Sep 2009 - Dec 2023	May 2021
Switzerland	1y9yf Govt Yield	CPI YoY	Feb 2001 - Dec 2023	Mar 2022
Norway	5y5yf Govt Yield	Underlying CPI YoY[3]	Feb 2003 - Dec 2023	Feb 2021
Australia	1y9yf Govt Yield	CPI QoQ	Q4 1998 - Q4 2023	Q3 2021
New Zealand	3y7yf OIS Rate	CPI QoQ	Q3 2001 - Q4 2023	Q3 2021

Note: Inflation surprises are defined as the difference between the median forecast in the Bloomberg survey and the rate of inflation as-released that day (unrevised).

[1] Inflation Compensation is the difference between the Treasury Yield and the Treasury Inflation Protected Security (TIPS) yield.

[2] Swedish CPIF fixes interest rates on household mortgage payments at a constant rate.

[3] Norwegian Underlying CPI excludes energy and adjusts for price changes due to tax policy.

[4] The Covid break date for each country, with the exception of Japan, is based on when 12-month inflation first exceeds the central bank's target following the start of the Covid episode in 2020. For Japan, we set the breakdate to the first month that inflation moved into positive territory and deflation ended.

Table 5: Baseline Anchoring Estimates: Response of Far-Forward Nominal Compensation to Inflation Surprises

	Pre-COVID			COVID Period			Chow Test	
	δ^{π}	SE	Obs	δ^{π}	SE	Obs	δ^{π}_{COVID}	SE
United States	−0.029	0.039	111	0.015	0.070	33	0.044	0.079
United Kingdom	0.061**	0.029	209	−0.005	0.054	31	−0.065	0.060
Japan	0.098**	0.039	231	0.001	0.083	27	−0.096	0.089
Canada	−0.015	0.015	261	−0.027	0.038	32	−0.012	0.040
Sweden	0.017	0.028	140	−0.062	0.089	32	−0.079	0.092
Switzerland	−0.018	0.017	250	0.076	0.062	22	0.094	0.062
Norway	0.036**	0.015	216	−0.004	0.044	35	−0.039	0.046
Australia	0.011	0.037	90	0.032	0.129	10	0.020	0.123
New Zealand	0.014	0.036	80	0.032	0.053	10	0.017	0.061

Note: Heteroskedasticity robust Eicker-White standard errors. *, **, or *** implies that the p-value is below 0.1, 0.05, 0.01, respectively.

Table 6: Robustness Anchoring Estimates: Response of Far-Forward Nominal Compensation to Inflation Surprises

		Pre-COVID			COVID Period			Chow Test	
		δ^{π}	se	Obs	δ^{π}	se	Obs	δ^{π}_{COVID}	se
United States									
	Universal Break Date	−0.047	0.045	98	0.023	0.051	46	0.070	0.068
	Energy Price Control	−0.033	0.037	111	0.019	0.074	33	0.052	0.081
	LAD Regression	0.017	0.033	111	−0.006	0.050	33	−0.023	0.050
United Kingdom									
	Universal Break Date	0.059*	0.032	201	−0.006	0.043	46	−0.064	0.053
	Energy Price Control	0.056*	0.028	216	−0.011	0.060	31	−0.067	0.065
	LAD Regression	0.038*	0.022	216	0.044	0.072	31	0.006	0.050
Japan									
	Universal Break Date	0.110***	0.042	212	−0.013	0.050	46	−0.123*	0.065
	Energy Price Control	0.101**	0.040	231	0.027	0.079	27	−0.075	0.085
	LAD Regression	0.029	0.024	231	−0.022	0.172	27	−0.051	0.088
Canada									
	Universal Break Date	−0.013	0.016	247	−0.034	0.026	46	−0.022	0.030
	Energy Price Control	−0.015	−0.015	261	−0.021	0.039	32	−0.006	0.041
	LAD Regression	−0.007	0.013	261	−0.044	0.055	32	−0.038	0.043
Sweden									
	Universal Break Date	0.032	0.030	126	−0.062	0.071	46	−0.093	0.076
	Energy Price Control	0.020	0.026	140	−0.074	0.089	32	−0.094	0.091
	LAD Regression	0.031	0.027	140	−0.041	0.068	32	−0.072	0.049
Switzerland									
	Universal Break Date	−0.016	0.018	226	0.036	0.044	46	0.052	0.047
	Energy Price Control	−0.017	0.017	250	0.106	0.061	22	0.123**	0.060
	LAD Regression	−0.020	0.013	250	0.116	0.099	22	0.136***	0.043
Norway									
	Universal Break Date	0.038**	0.016	205	−0.004	0.035	46	−0.042	0.038
	Energy Price Control	0.034**	0.015	216	−0.004	0.045	35	−0.038	0.046
	LAD Regression	0.025*	0.013	216	−0.012	0.038	35	−0.037	0.031
Australia									
	Universal Break Date	0.015	0.038	85	−0.027	0.086	15	−0.042	0.090
	Energy Price Control	0.017	0.036	90	0.048	0.031	10	0.031	0.139
	LAD Regression	0.050	0.052	90	0.075	0.247	10	0.025	0.215
New Zealand									
	Universal Break Date	0.024	0.038	75	0.036	0.046	15	0.012	0.059
	Energy Price Control	0.015	0.036	80	0.036	0.060	10	0.021	0.064
	LAD Regression	0.053	0.037	80	0.100	0.065	10	0.047	0.078

Note: Heteroskedasticity robust Eicker-White Standard Errors. *, **, or *** implies that the p-value is below 0.1, 0.05, 0.01, respectively.

Table 7: Additional Analysis for the United Kingdom: Response of Far Forward Nominal Compensation to Inflation Surprises

	1998-2003	Pre-COVID	COVID Period
Baseline CPI Surprises		0.054**	-0.004
SE		(0.029)	(0.054)
Obs		209	31
Alternative RPIX Surprises	-0.065	0.053**	-0.047
SE	(0.041)	(0.023)	(0.064)
Obs	60	209	31

Note: Heteroskedasticity robust Eicker-White Standard Errors. *, **, or *** implies that the p-value is below 0.1, 0.05, 0.01, respectively.

Table 8: Data Details by Country: Estimating the Perceived Policy Response to Inflation

Country	Interest Rate Future	Inflation Surprise	Sample Dates	Covid Break Date[3]
United States	1y OIS Swap Rate	Core CPI MoM	Oct 2003 - Dec 2023	Apr 2021
United Kingdom	1y OIS Swap Rate	CPI YoY	Jan 2009 - Dec 2003	Jun 2021
Japan	1y OIS Swap Rate	CPI ex Fresh Food YoY	Aug 2002 - Dec 2023	Oct 2021
Canada	1y OIS Swap Rate	CPI YoY	Sep 2008 - Dec 2023	May 2021
Sweden	1y OIS Swap Rate	CPIF YoY[1]	Sep 2009 - Dec 2023	May 2021
Switzerland	2y OIS Swap Rate	CPI YoY	Feb 2001 - Dec 2023	Mar 2022
Norway	1y OIS Swap Rate	Underlying CPI YoY[2]	Feb 2003 - Dec 2023	Feb 2021
Australia	1y OIS Swap Rate	CPI QoQ	Q1 2000 - Q4 2023	Q3 2021
New Zealand	1y OIS Swap Rate	CPI QoQ	Q3 2001 - Q4 2023	Q3 2021

Note: Inflation surprises are defined as the difference between the median forecast in the Bloomberg survey and the rate of inflation as-released that day (unrevised).

[1] Swedish CPIF fixes interest rates on household mortgage payments at a constant rate.

[2] Norwegian Underlying CPI excludes energy and adjusts for price changes due to tax policy.

[3] The Covid break date for each country, with the exception of Japan, is based on when 12-month inflation first exceeds the central bank's target following the start of the Covid episode in 2020. For Japan, we set the breakdate to the first month that inflation moved into positive territory and deflation ended.

Table 9: Baseline Perceived Policy Response Estimates: Response of Near-Term Interest Rate Futures to Inflation Surprises

	Pre-COVID			COVID Period			Chow Test	
	ϕ_π	SE	Obs	ϕ_π	SE	Obs	$\phi_{\pi,COVID}$	SE
United States	0.083***	0.030	210	0.269*	0.140	33	0.186	0.137
United Kingdom	0.068*	0.035	149	0.435***	0.095	31	0.367***	0.099
Japan	0.028	0.019	201	0.014	0.079	27	−0.014	0.079
Canada	0.039***	0.011	152	0.097*	0.039	32	0.059	0.040
Sweden	0.076***	0.013	140	0.089***	0.038	32	0.013	0.040
Switzerland	0.030***	0.009	250	0.227***	0.072	22	0.197***	0.070
Norway	0.090***	0.016	216	0.139***	0.033	35	0.049	0.036
Australia	0.184***	0.028	85	0.417***	0.123	10	0.232**	0.116
New Zealand	0.128***	0.030	80	0.239***	0.059	10	0.112*	0.062

Note: Heteroskedasticity robust Eicker-White standard errors. *, **, or *** implies that the p-value is below 0.1, 0.05, 0.01, respectively.

Table 10: Shifts in Perceived Policy Responses: Pre-COVID, August 2020, and COVID Period

	ϕ_π	$\phi_{\pi,FAIT}$	$\phi_{\pi,COVID}$	Obs
United States	0.101***	−0.108***	0.278**	243
	(0.033)	(0.034)	(0.135)	
United Kingdom	0.078*	−0.077*	0.434***	180
	(0.040)	(0.041)	(0.094)	
Japan	0.030	−0.033	0.018	228
	(0.020)	(0.023)	(0.077)	
Canada	0.042***	−0.049***	0.104**	184
	(0.011)	(0.014)	(0.040)	
Sweden	0.081***	−0.072**	0.080*	172
	(0.014)	(0.027)	(0.044)	
Switzerland	0.031***	−0.020	0.215***	272
	(0.010)	(0.020)	(0.072)	
Norway	0.094***	−0.097***	0.142***	251
	(0.017)	(0.019)	(0.033)	
Australia	0.189***	−0.110***	0.338***	95
	(0.029)	(0.039)	(0.116)	
New Zealand	0.130***	−0.051	0.161***	90
	(0.032)	(0.033)	(0.055)	

Note: Heteroskedasticity robust Eicker-White standard errors. *, **, or *** implies that the p-value is below 0.1, 0.05, 0.01, respectively.

Figure 1: Responses to Demand Shock Under Anchored & Drifting Inflation Expectations

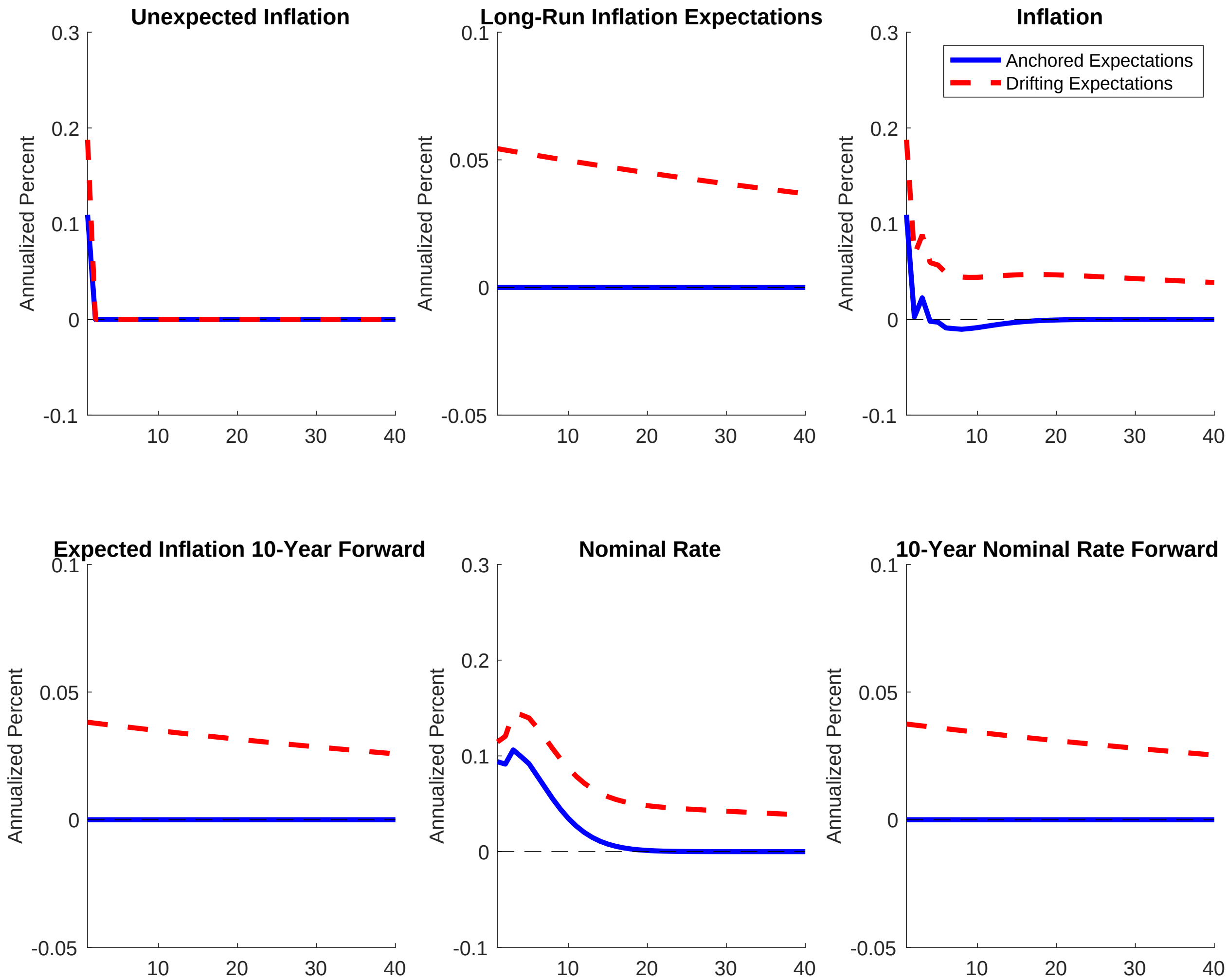
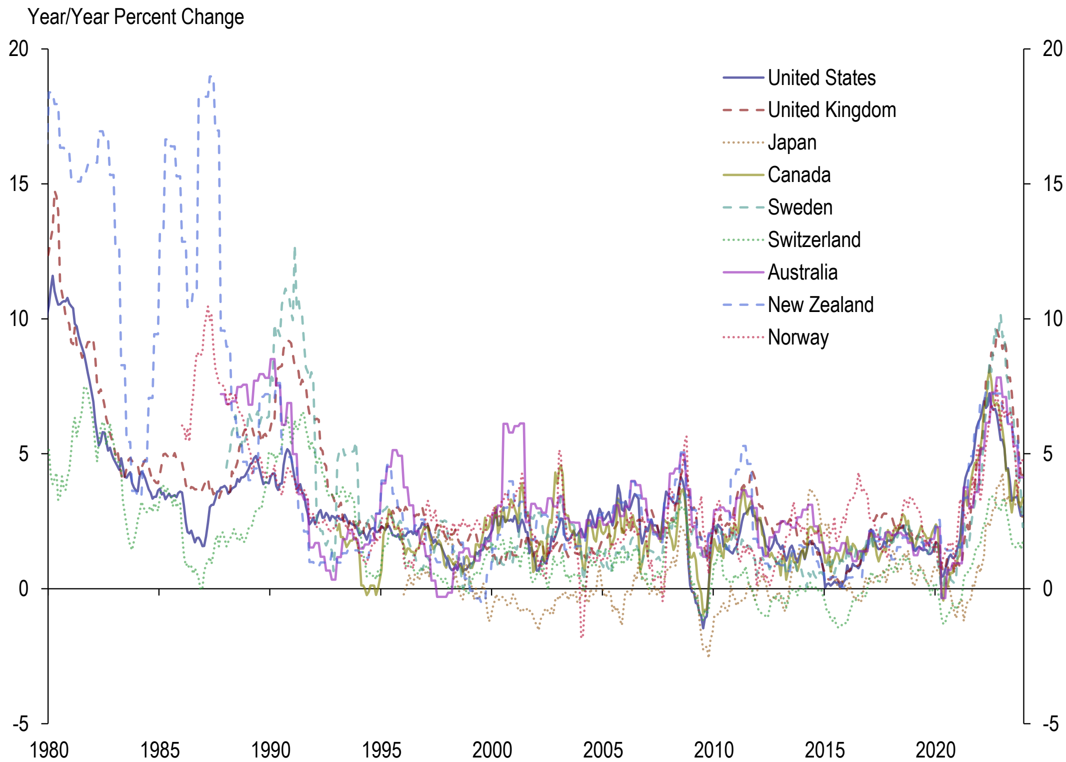
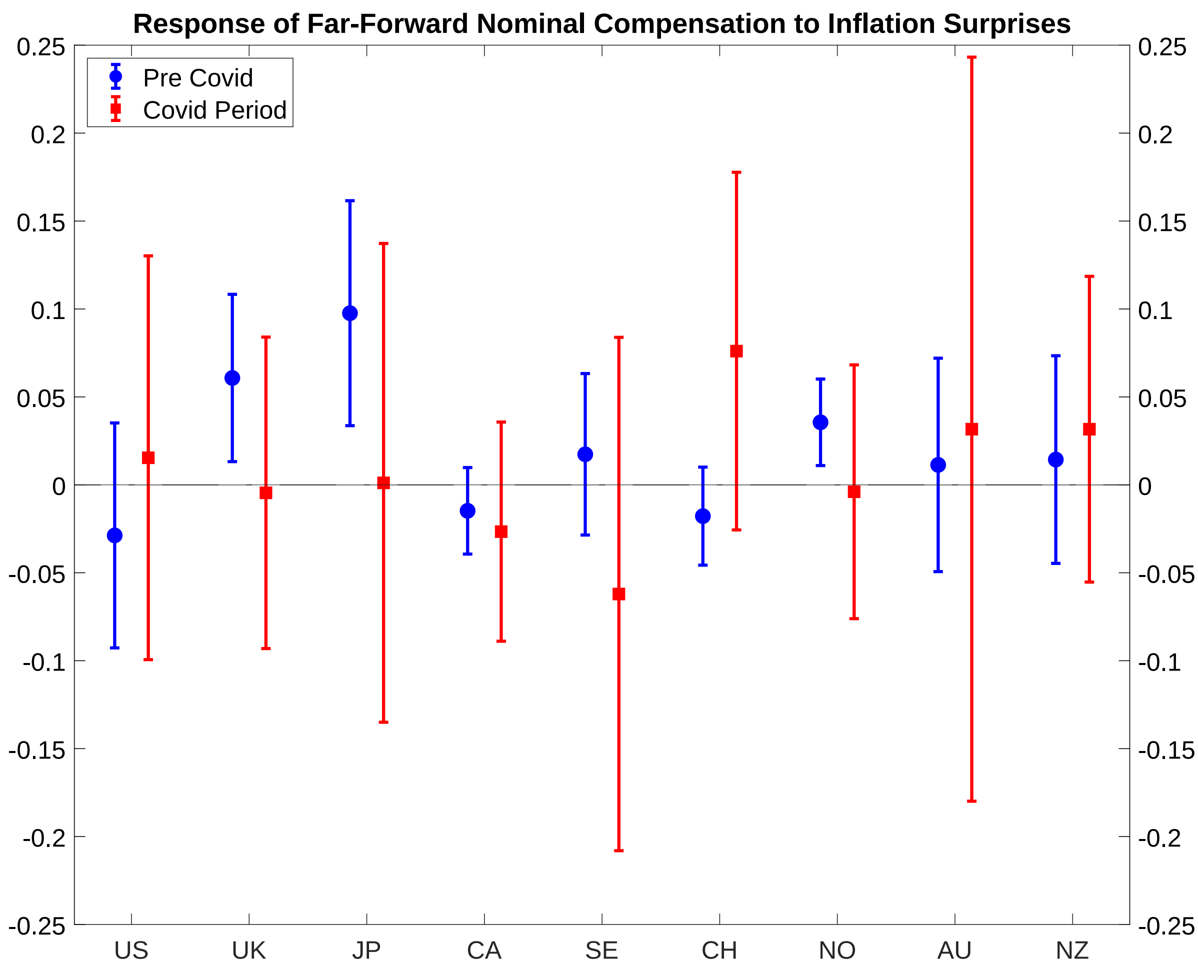


Figure 2: After the onset of the COVID-19 pandemic, inflation rose to multi-decade highs



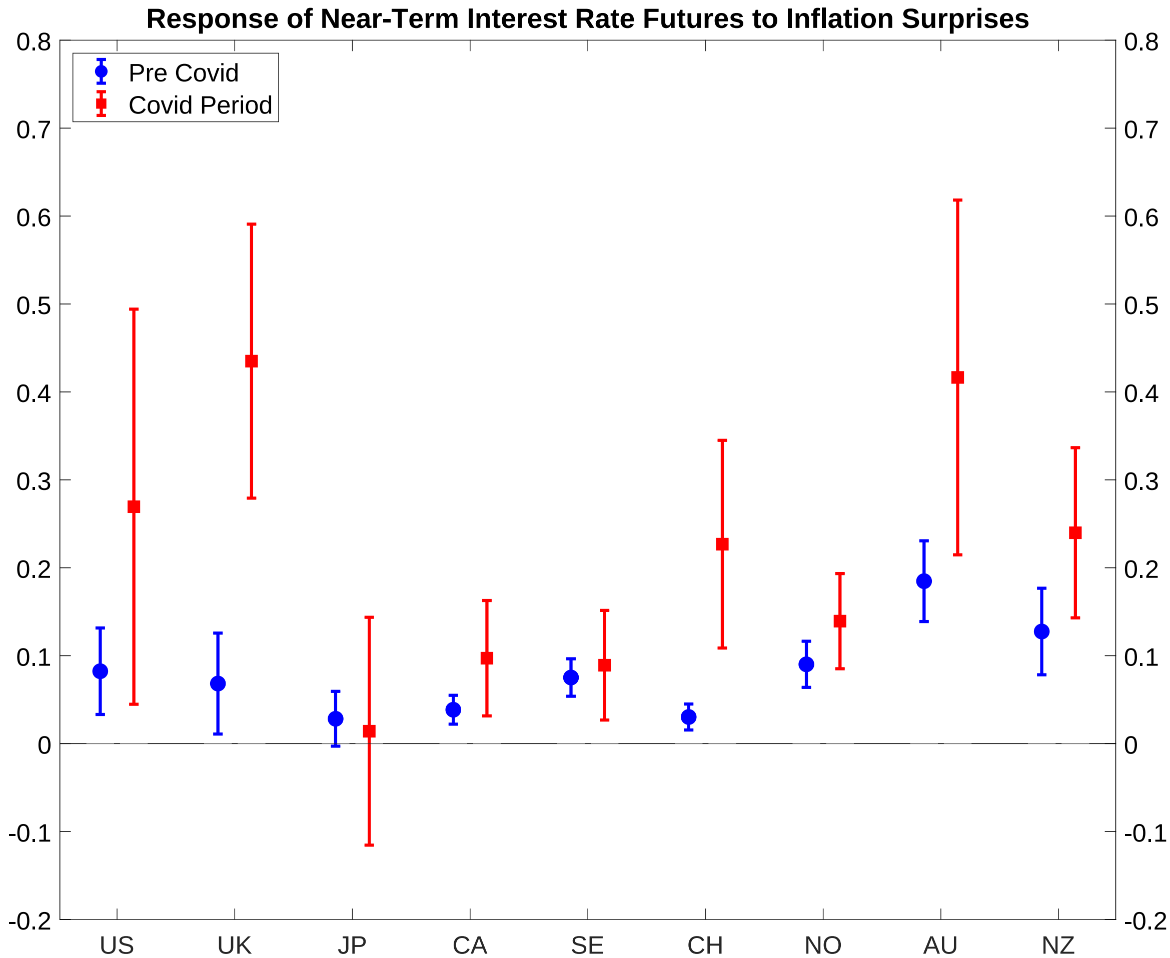
Note: This figure shows year/year inflation measures in each of the nine countries we study. The inflation measure for each country is based on the inflation measure each central bank currently targets. See Section 4 for details.

Figure 3: Baseline Estimates of Inflation Expectations Anchoring: Pre-COVID and COVID Periods



Note: The circle dot and blue lines show the point estimates of anchoring pre-COVID along with 90% confidence intervals. The square dot and red lines show the point estimates of anchoring during the COVID Period along with 90% confidence intervals. See Section 4 for details.

Figure 4: Baseline Estimates of Perceived Policy Response to Inflation: Pre-COVID and COVID Periods



Note: The circle dot and blue lines show the point estimates of anchoring pre-COVID along with 90% confidence intervals. The square dot and red lines show the point estimates of anchoring during the COVID Period along with 90% confidence intervals. See Section 4 for details.