

The goal of this exercise was to test whether expectations became less anchored after COVID-19 and the subsequent onset of high inflation in the US and the Euro area. To do this, we ran multiple regressions focusing on the effect that errors in inflation forecast prediction have on revising the long-term forecasts for inflation.

1 Matching

SPF - 0, 1, 2, 3, 4 Quarters ahead, 0, 1, 2 Calendar Years ahead and average of 0-4 and 0-9 years ahead.

ECBSPF - 3, 7 Quarters ahead, 0, 1(Q1/2), 2(Q3,4), 4(Q1/2) and 5(Q3/4) Calendar Years ahead.

The table below explains the difference between the variables which do not match exactly the long-term revisions, meaning that they will simply check what the long-term prediction was in the previous quarter. On the contrary, matched variables only check the previous quarter value if the long-run prediction is for the same year.

	Quarter	Non-exact	Errors (SPF)	Errors (ECBSPF)	Exact LR (SPF)	Exact LR (ECBSPF)
	Q1	1,2,3,4	1,2,3,4	3	-	1,2
!	Q2	1,2,3,4	1,2,3,4	3	1	1,2,3
	Q3	1,2,3,4	1,2,3,4	3	1,2	-
	Q4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3	1

2 US SPF

2.1 Aggregating across horizons

To start, we estimated the effects using data at the individual level. We used both the non-exact and exactly matched values. Thus, we estimated the aforementioned equation in various different ways (long-term can either be $36 = 9$ years or $16 = 4$ years):

1. $F_{i,t}\pi_{t+36} - F_{i,t-h}\pi_{t+36-h} = \Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t)$ - Estimates a simple pooled regression, pooling forecasters, quarters and horizons
2. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \gamma \cdot \text{Industry}_i$ - Same as (1) but controls for forecaster's industry (Financial, non-financial, unknown)
3. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \phi_i$ - FE by Forecaster, since it is likely that a forecaster's error revision is linked with his own forecasting error
4. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \eta_t$ - FE for all time periods, since all forecasters' predictions in a time period are connected
5. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \phi_i + \eta_t$ - FE by Forecaster and time period
6. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \phi_i + \zeta_h$ - Adding horizon FE to Forecaster, as horizons are not perfect matches in some scenarios, and forecast errors may be correlated with the horizon (larger errors for longer horizons)
7. $\Delta_h F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \phi_i + \eta_t + \zeta_h$ - FE by Forecaster, time period and horizon, best specification. Important to include horizon and quarter simultaneously as quarter is the time at which the forecast is made, horizon the distance
8. $\Delta_t F_{i,t}\pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h}\pi_t) + \eta_t + \iota_I$ - Quarter and Industry FE, controls for a forecaster's institution type being linked with his forecast. Better to have simply Forecaster FE

Then to understand if some horizons were of more importance than others, we ran:

By horizon ($h = 1$; or $2,3,4$):

$$\Delta_1 F_{i,t} \pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-1} \pi_t)$$

$$\Delta_1 F_{i,t} \pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-1} \pi_t) + \phi_i + \eta_t$$

Non-matched data is preferable - slide 5 and 7 - since for US SPF the long-term predictions are based on the 0-4 or 0-9 year average inflation. Hence, specially for the 10 Year π_{t+36} it is unlikely that the abusive matching creates large inconsistencies. It is preferable to make use of the larger database.

2.2 Robustness

I was questioning whether the large coefficient change after 2022 was due to an actual de-anchoring of expectations, or simply noise in a shorter observation span. **To test this I run the OLS and preferred regression (Forecaster, Quarter and Horizon FE) for five-year time spans.**

Slides 10 and 12 do this for 10 Year and 5 Year forecasts, respectively, without the exact matching of years.

Slides 11 and 13, match the years exactly.

Then I repeated the experiment, but either for all quarters or all years. Here I run both OLS and FE for Forecaster and Horizon, since quarter FE are no longer possible (Slides 14-16).

2.3 Median Forecasts

1. $F_t \pi_{t+36} - F_{t-h} \pi_{t+36-h} = \Delta_h F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{t-h} \pi_t)$
2. $\Delta_h F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{t-h} \pi_t) + \eta_t$
3. $\Delta_h F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{t-h} \pi_t) + \zeta_h$
4. $\Delta_h F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{i,t-h} \pi_t) + \eta_t + \zeta_h$

By horizon ($h = 1$; or 2,3,4):

$$\Delta_1 F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{t-1} \pi_t)$$

$$\Delta_1 F_t \pi_{t+36} = \alpha + \beta(\pi_t - F_{t-1} \pi_t) + \eta_t$$

Same logic as in individual forecasts. Re-ran with median to test whether results would be slightly different. **Best specification is non-matched with Quarter and Horizon FE, as there are no Forecaster IDs anymore.**

3 ECB SPF

In general it is the same as the US SPF, except that the data is less exact and there is not 10 year forecast.

For aggregated data **matched data is preferable - slide 29** - in the ECB SPF, the long-term prediction variable is 4 years if in Q1/2 and 5 years if in Q3/4. Moreover, the forecasters are asked about their inflation predictions for the end of year 0, 1, 2 and 3 and 7 quarters ahead, this makes the error calculation more limited, as some quarters will only have one horizon. Thus, the overall larger margin of error in the ECBSPF makes it preferable to use exact matching to be certain that the long-term prediction revisions are matched with the errors, for the same forecast span.

For the median data, same logic as in individual forecasts. Re-ran with median to test whether results would be slightly different. Matching limits the data points to 7 for 2022-2025, which only allows Horizon FE. **Hence, non-matched with FE for quarter and Horizon is preferable for the median data - slide 37 (4)**

4 Output explanation

There are four folders for either Individual data or median, for both samples.

4.1 Excel files

5 year or 10 year is the long-term prediction for the US SPF; lr for the 5 year in ECB SPF

precovid for $< 2020Q1$, **postcovid** for $\geq 2022Q1$

exact if the matching technique was exact (if blank then non-exact)

robustness if I was estimating the data for 5 years spans separately with all the FE parameters

horizon if I was segregating for each of the four horizons

med for median estimations

euro if the error was estimated based on the euro area inflation; **eu** for EU

4.2 PDF files

These are the robustness graphs per year or quarter, the above guidelines apply, and yearly means I estimated the coefficient per year, while quarterly by quarter.