CNB CZECH NATIONAL BANK

Recent Inflation Surge

Preliminary policy lessons

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EEFC online seminar

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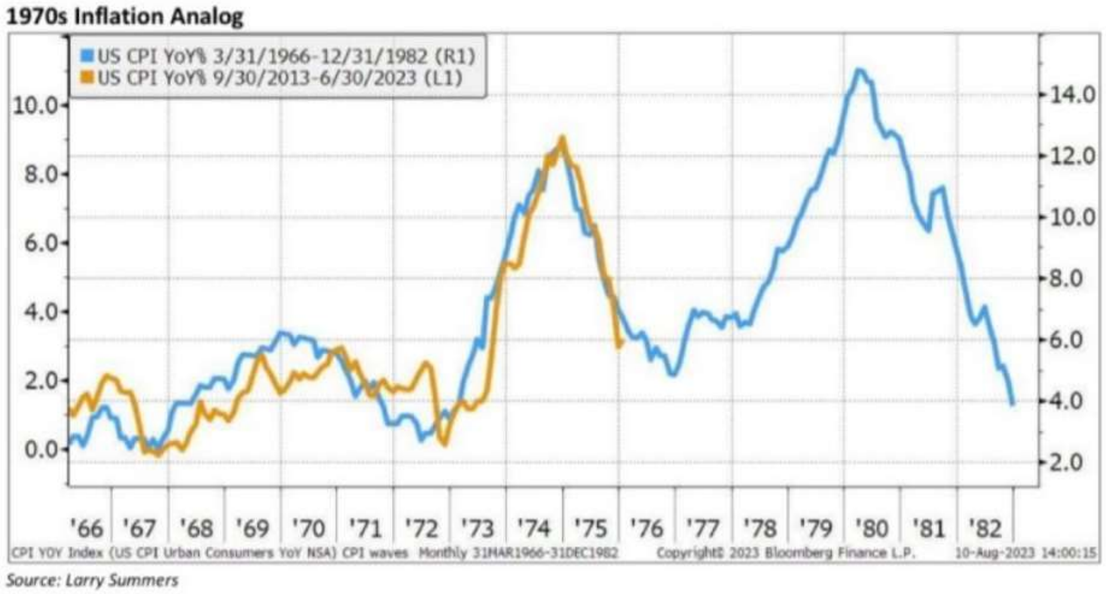
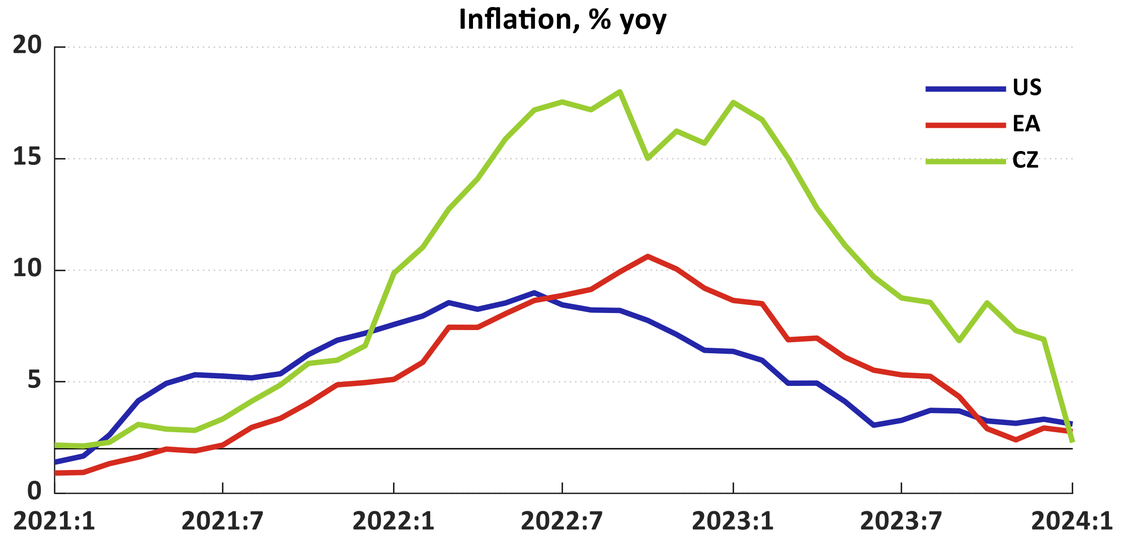
"*Our monetary policy deliberations and decisions build on what we have learned about inflation dynamics both from the high and volatile inflation of the 1970s and 1980s, and from the low and stable inflation of the past quarter-century…These lessons are guiding us as we use our tools to bring inflation down…We will keep at it until we are confident the job is done*."

Jerome Powell, 26 August 2022, Jackson Hole

Does the recent inflation surge look very much like that of the 1970s?



Source: Kharroubi and Smets (2024)



Source: FRED, Eurostat, CZSO

In both instances, inflation quickly reached high levels on the back of commodity shocks, which transmitted to the prices of goods and services, generating broad-based inflationary pressures. Macro policies had been loose before those shocks.

Given the “twin peak” profile of inflation in the 1970s, should we worry that the current inflation decline is only transitory?

Or is the comparison with the 1970s misleading? The inflation then was driven by labour costs, while the recent price rally was due more to unit profits. The comparison may just remind us of the costs of a big policy failure (recall the Turkish inflation profile).

Outline

I. Stylised facts of the recent inflation surge

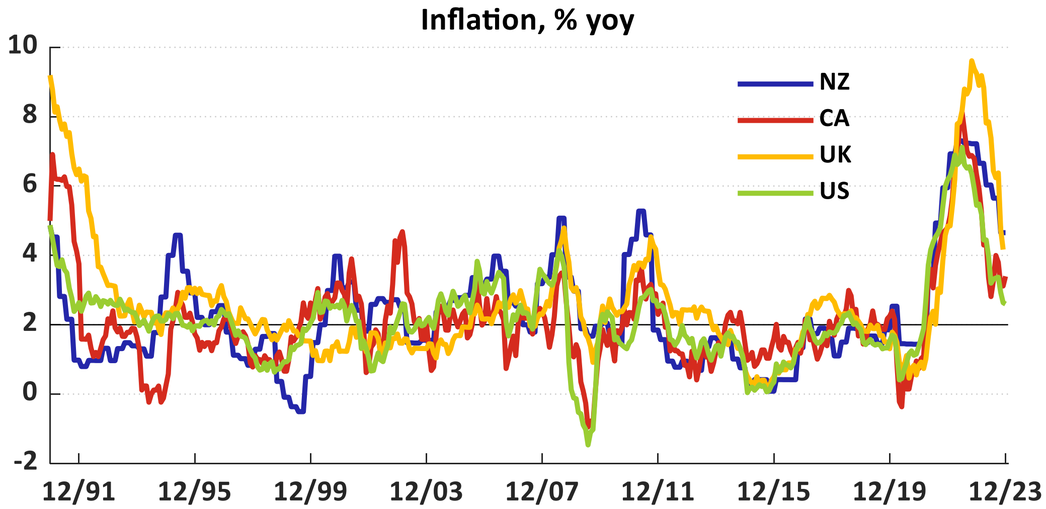
II. Did central bankers overlook anything? Should inflation (forecast) targeting be revised?

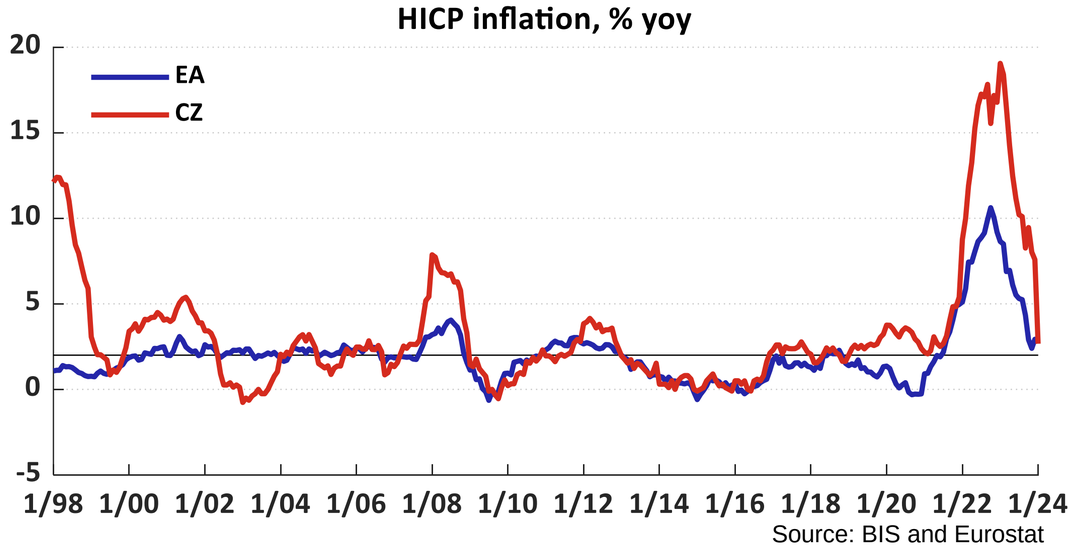
III. Preliminary lessons for monetary policy conduct

Stylised facts of the recent inflation surge

1. High inflation well above targets caught us by surprise.
2. Price increases were widespread, driven by both supply- and demand-side factors.
3. There were large – and still not well understood – geographical differences in the size of the inflation wave.
4. Corporate profit margins and price-setting behaviour contributed to the inflation surge.
5. Monetary policy responses fell behind the curve initially (to different degrees for different central banks).
6. De-anchoring of inflation expectations and risks of persistent inflation started to be perceived as a major risk only later on.
7. But so far so good, nominal wage growth has remained reasonably benign in most countries, despite tight labour markets.
8. A soft landing seems to be feasible at the current juncture.

1. High inflation above targets





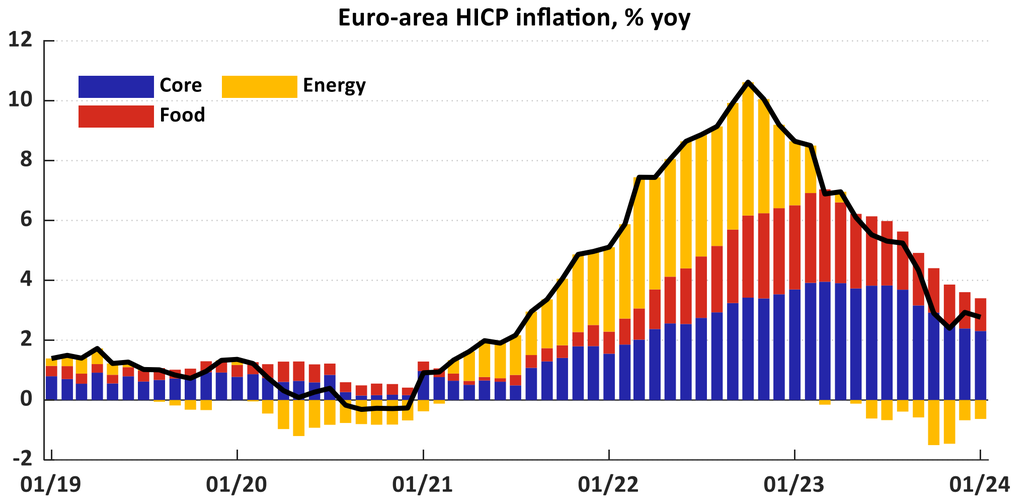
Source: BIS and Eurostat

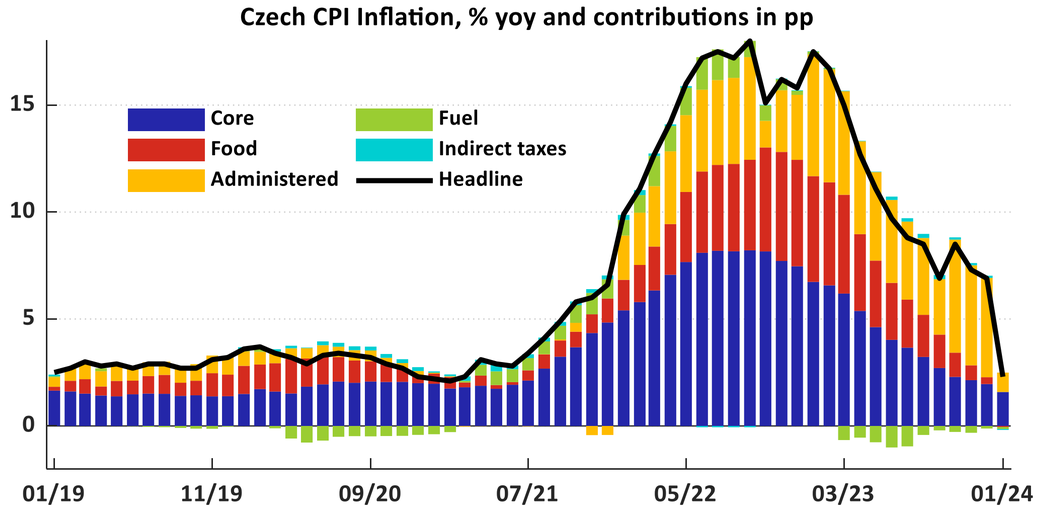
After the Covid shock, the **real economy** recovered quickly, but **inflation** rose to heights not seen for decades. Inflation peaked at the end of 2022, reaching levels last seen in the early 1990s.

High and persistent inflation in the 1970s to early 1990s led to a revolution in monetary policy strategy called **inflation (forecast) targeting** (the RBNZ in 1990, the BoC in 1991, the BoE in 1992, the CNB in 1998, etc.).

The GFC **ended the Great Moderation** in terms of GDP volatility. Covid did the same with regard to inflation volatility.

2. Widespread price increases





Source: CZSO and Eurostat

Soaring **energy prices** related to the war in Ukraine, along with rising **food prices**, raised inflation in 2021/2022. However, **core inflation** also rose.

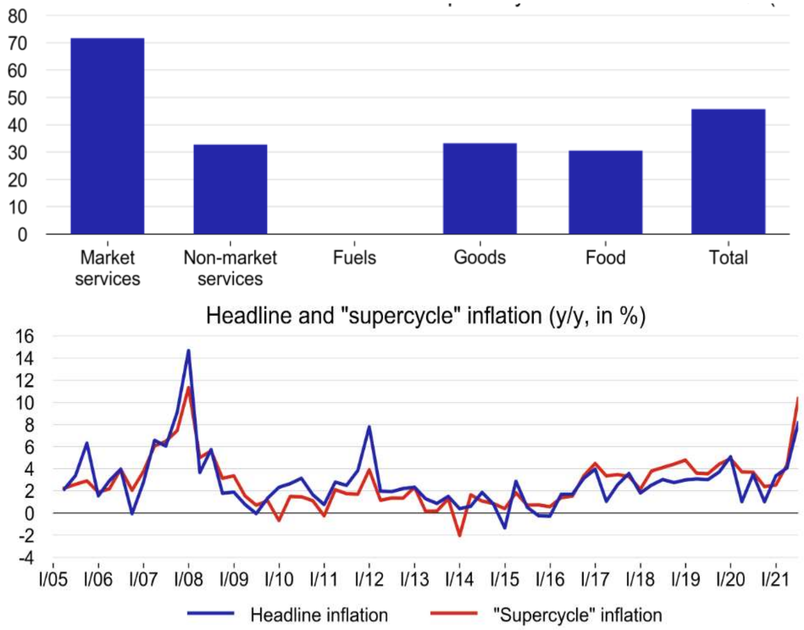
The peaks in core inflation differ across countries, reflecting different pass-through, business cycle positions and policies.

The high core inflation can be only partly explained by **spillover effects** from energy prices. Elevated profits also suggest **robust demand**.

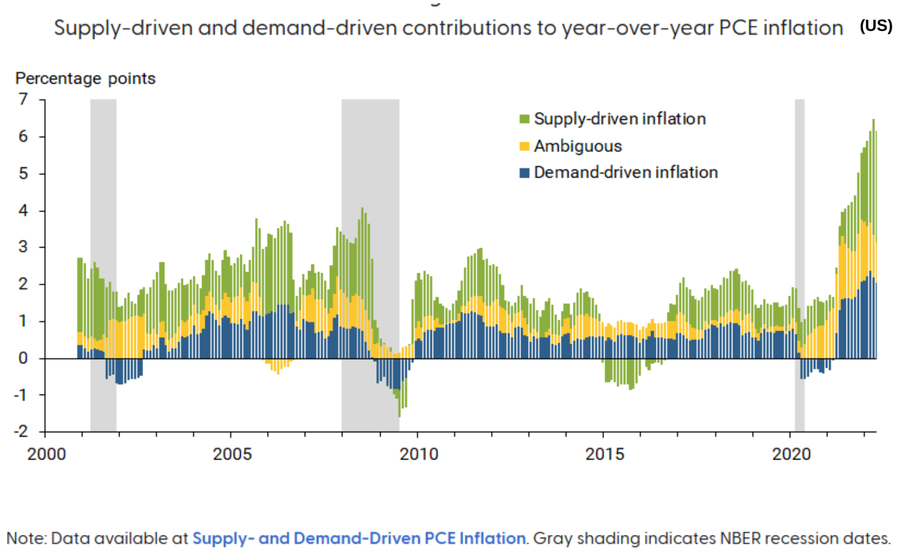
Compared to the EA, Czech core inflation increased earlier but has been somewhat less persistent (partly due to imputed rents).

2. Widespread price increases – supply versus demand

Estimated share of demand environment in quarterly CPI inflation in 2021 Q3 (in %)



Source: CNB



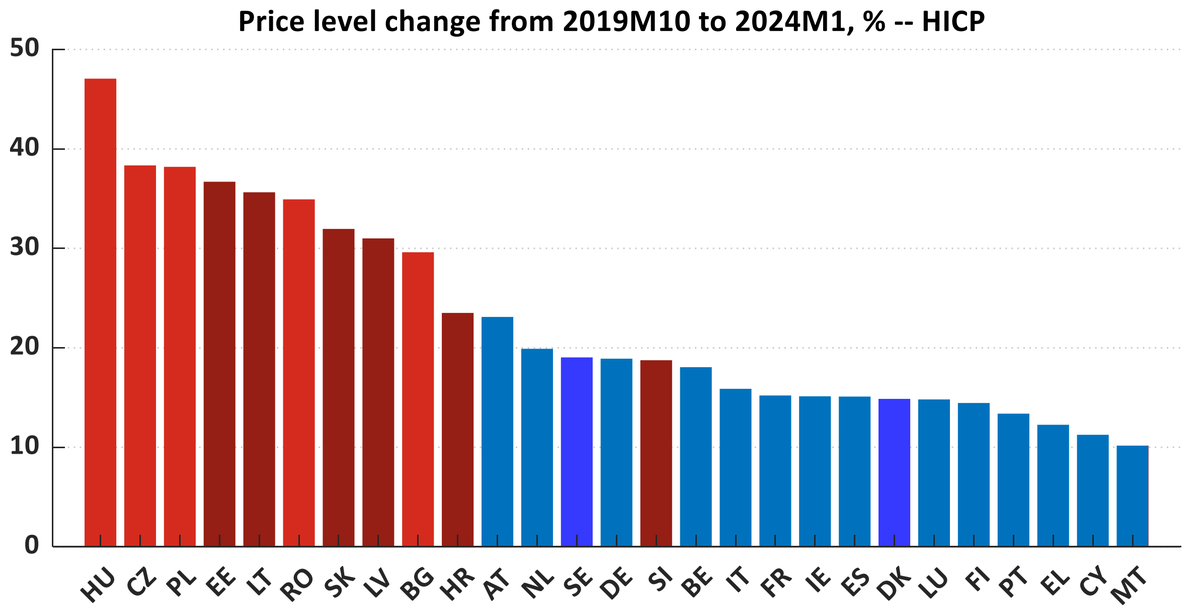
Source: Shapiro (2022)

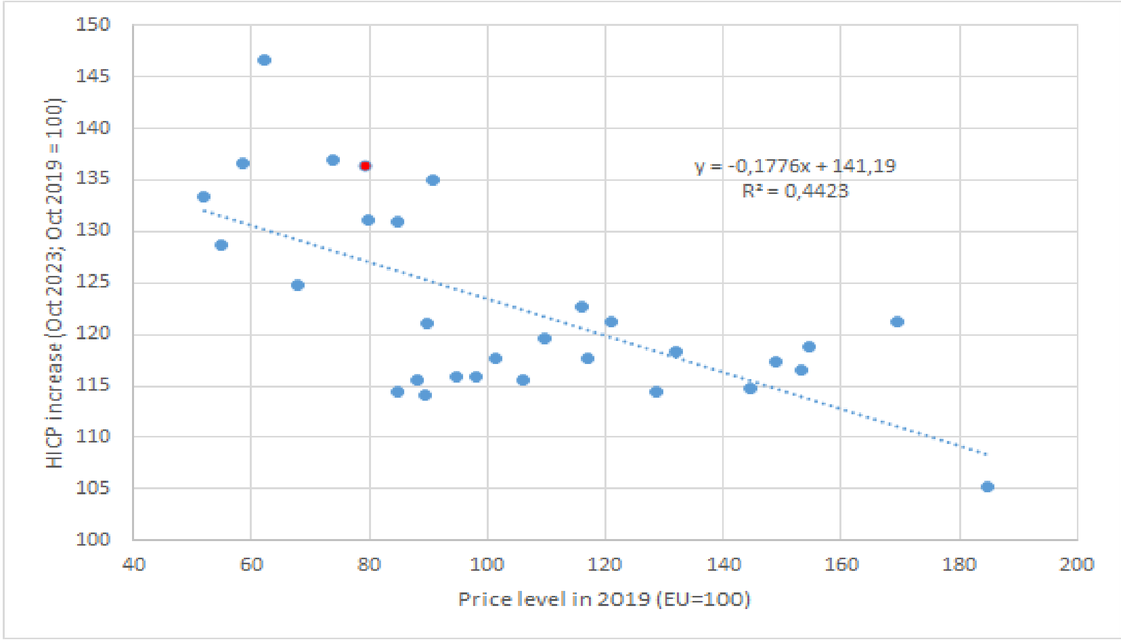
Besides the cost effects from abroad, a strongly **inflationary domestic environment** pushed inflation up in the Czech Republic.

Shapiro (2022) claims that in the US, **supply factors** explain about half of the run-up in inflation levels. **Demand factors** are responsible for about one-third, with the remainder resulting from ambiguous factors.

Hence, inflation was driven by a combination of **supply disruptions** (bottlenecks) and **demand-side** factors (a strong recovery of demand after lockdowns and shifts in demand between services and goods), along with a **commodity price** shock.

3. Large geographical differences in the inflation surge



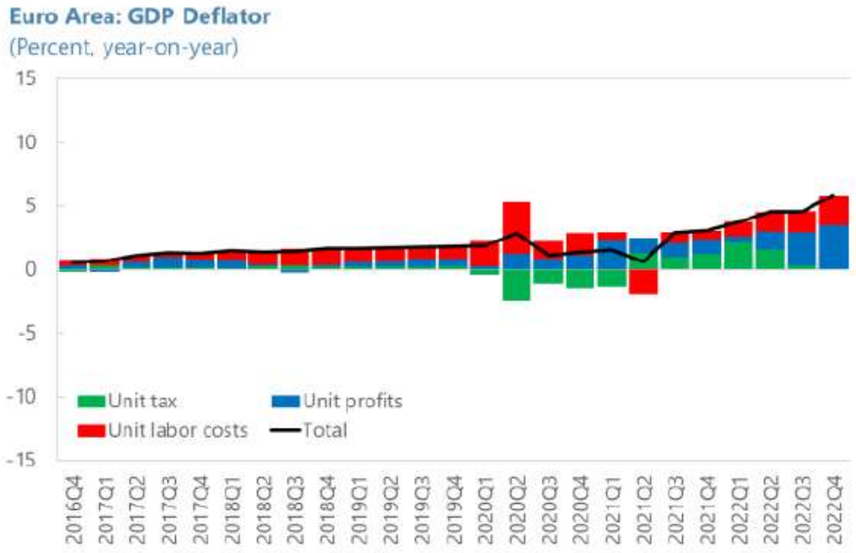


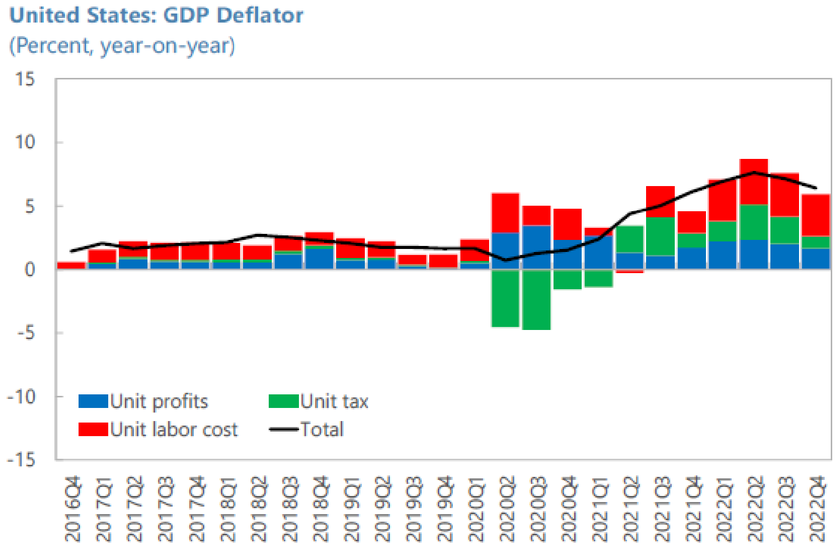
Source: Eurostat

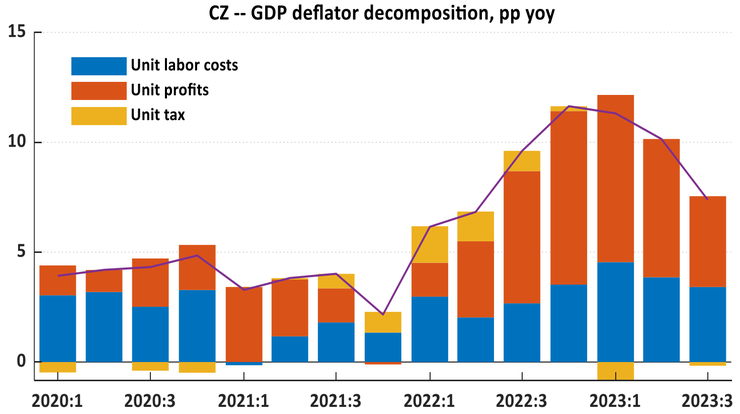
Prices clearly **went up more in post-communist countries (CEECs)** than in western countries, **irrespective of the MP regime**. This is a stylised fact that we still do not understand well.

Possible explanations: geographical proximity to Russia, lower starting GDP and price levels, less competitive retail markets, higher energy intensity, less well anchored inflation expectations given more recent memories of high inflation…

4. Significant role of profit margins





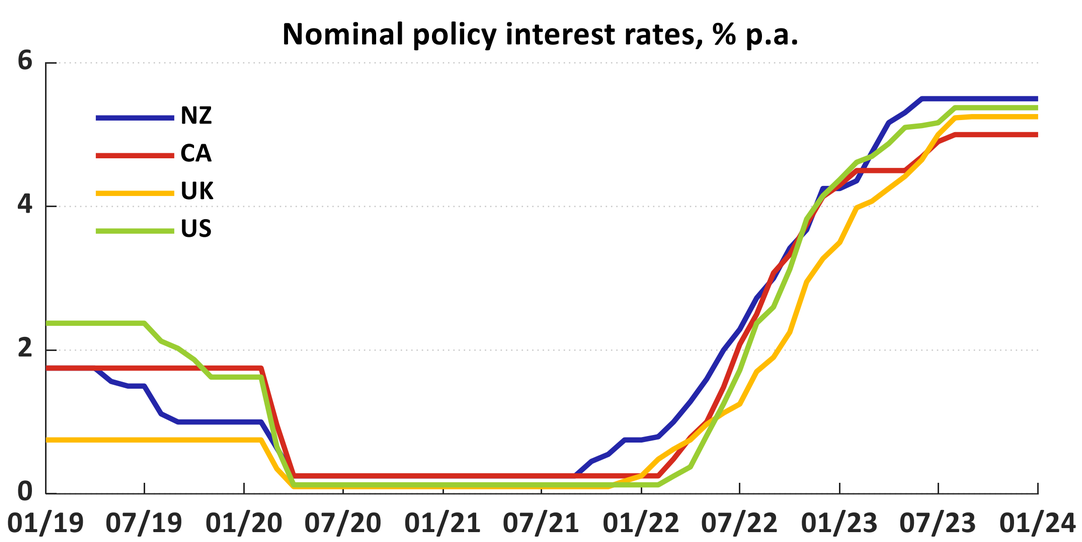


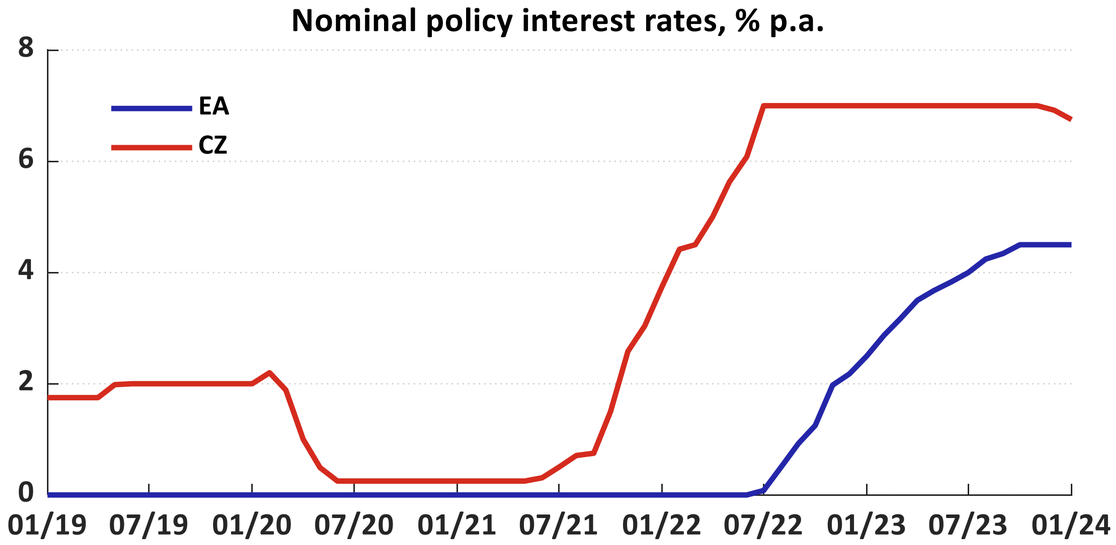
Source: Hansen et al., IMF (2023)

*"We show that import prices account for 40 percent of the average change in the consumption deflator over 2022Q1 – 2023Q1 (in the EA), while **domestic profits account for 45 percent**. The increase in nominal profits was largest in sectors benefiting from increasing international commodity prices and those exposed to recent supply-demand mismatches."*

Higher profits have **also** contributed significantly to inflation **in the Czech Republic**.

5. Monetary policy response





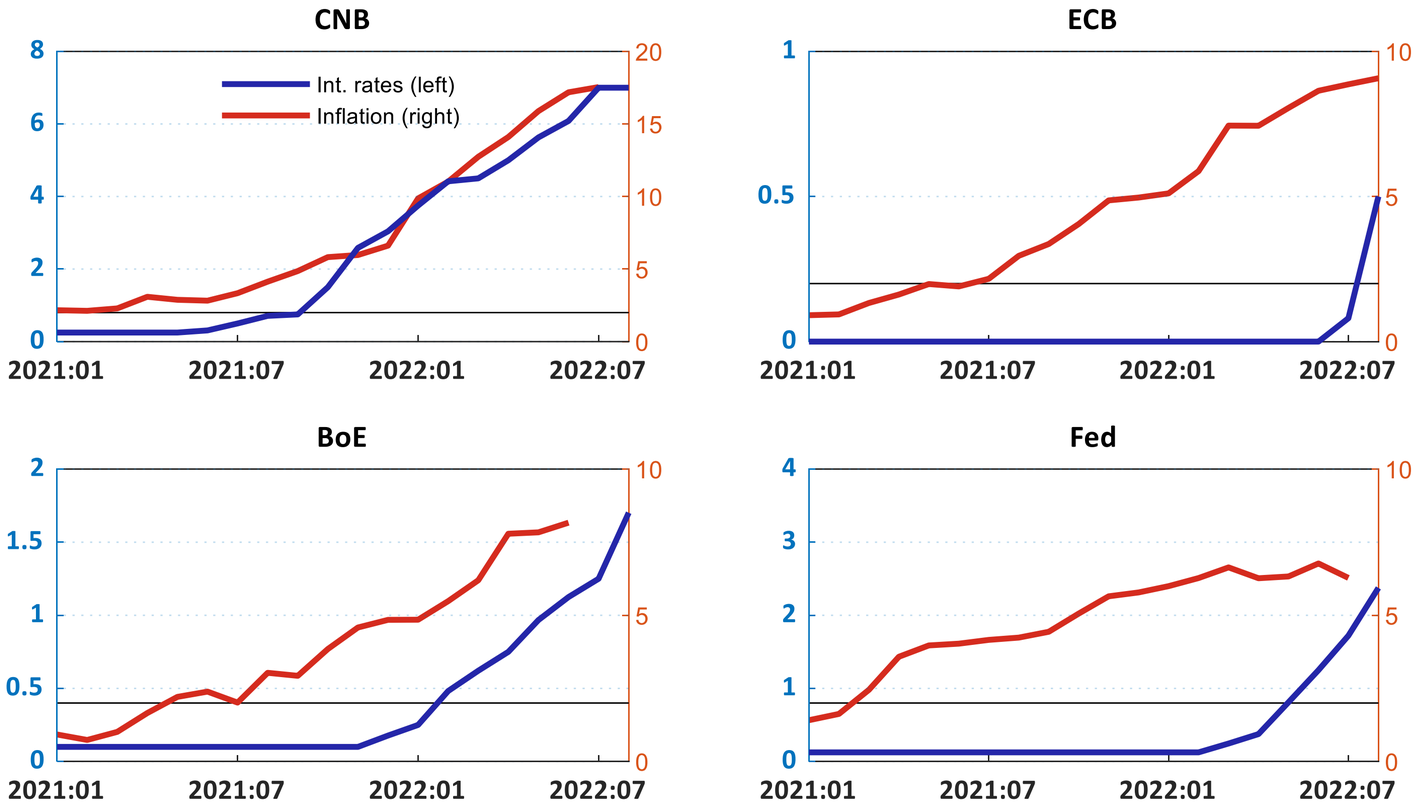
Source: Central banks

Prior to the inflation surge, even the "**keep it hot**" strategy did not bring inflation up => studies on flattening of Phillips curves; perceived renewed deflation risks shaped the Covid policy response (including the reintroduction of UMP measures).

Given the past experience, **central banks** were hesitant to respond to the rising inflation. The supply-side nature of the bottlenecks and doubts about the robustness of the real economic recovery delayed the monetary policy response initially.

The CNB started to hike well ahead of the major central banks (but still too late from an ex-post perspective).

5. Monetary policy response falling behind the curve



Source: Central banks and statistical offices

Were central banks' responses forward-looking or did they fall behind the curve?

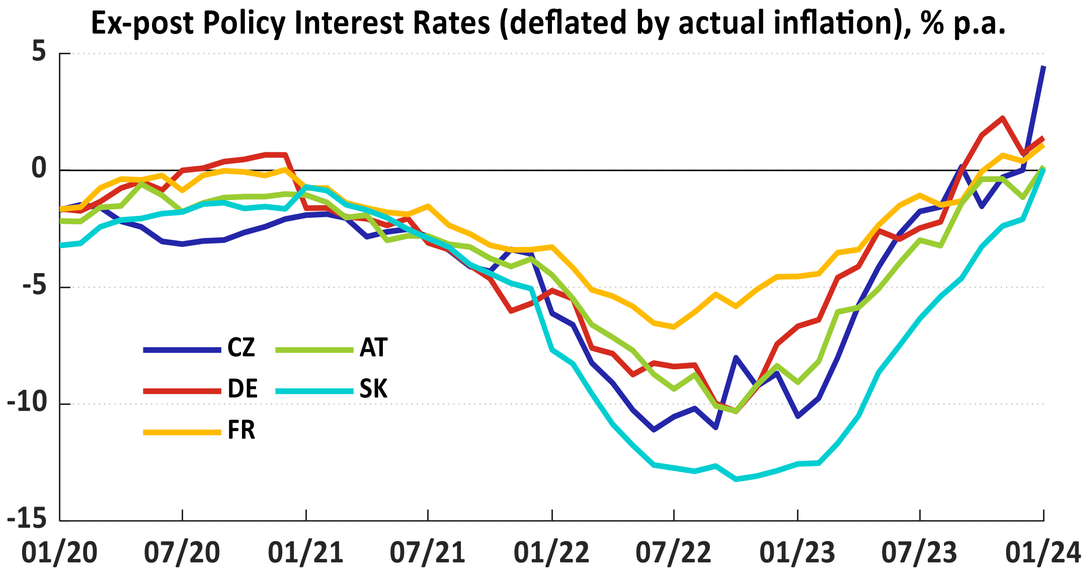
Initially, the **supply shocks were** considered **short-lived**, raising inflation only temporarily.

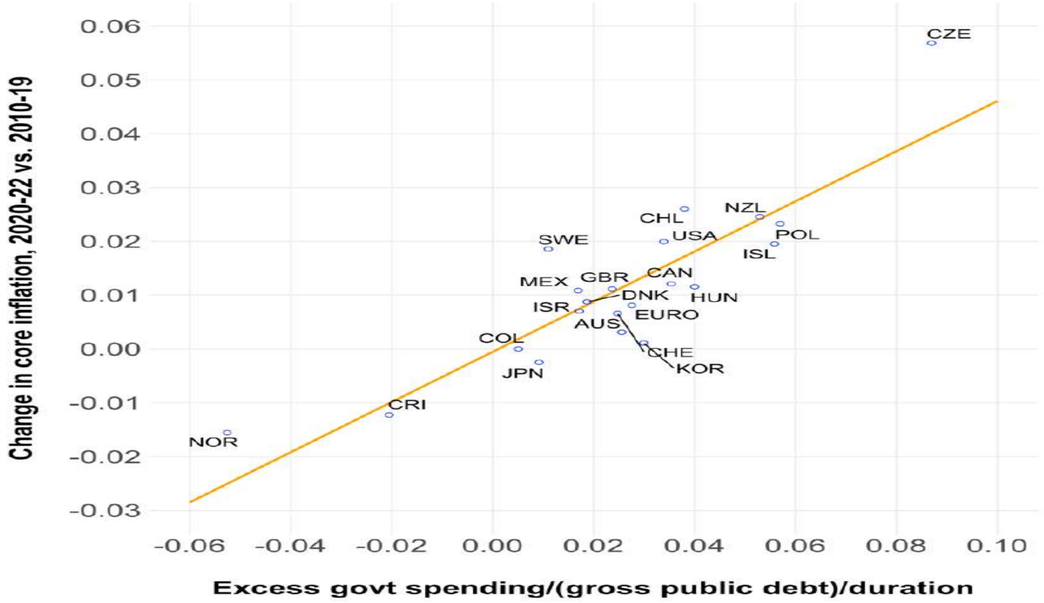
"Looking through" shocks, or arguing that shocks are **"outside the scope of MP"**, was considered a desirable and benign approach with respect to inflation based on past experience.

No more **"whatever it takes"** statements as heard during the Great Moderation in the 1990s.

From the ex-post perspective, **central banks fell behind the curve** initially, allowing real interest rates to decline further.

5. Monetary policy response falling behind the curve (cont.)





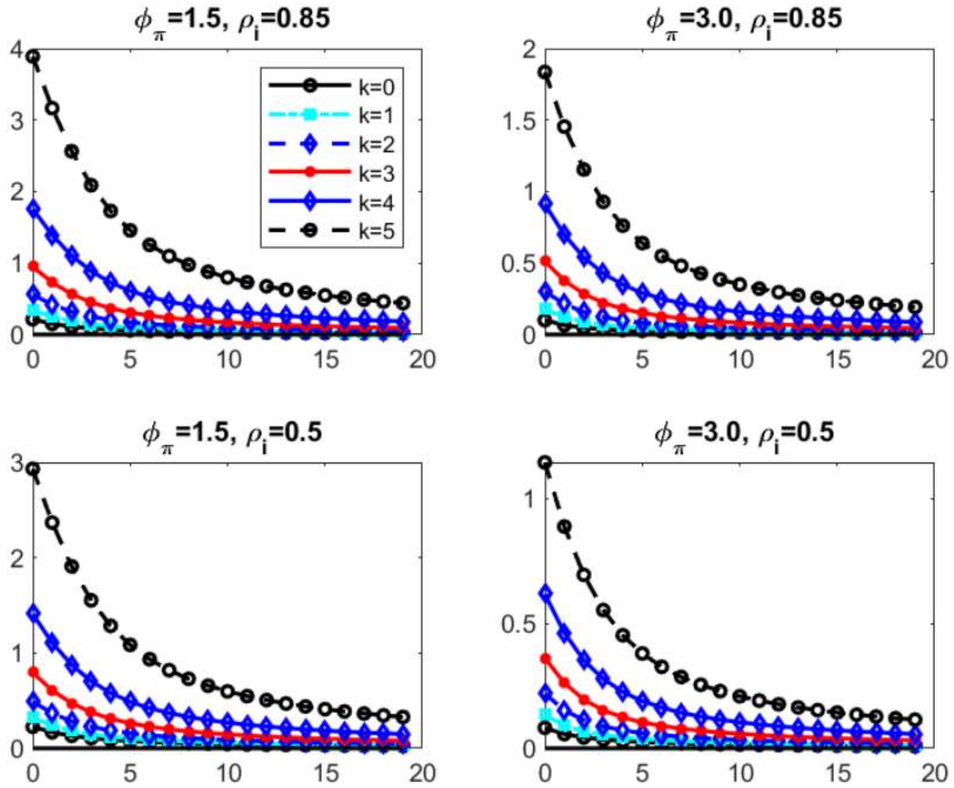
Source: Barro and Bianchi (2023)

Even though the CNB started to hike nominal interest rates much sooner and faster than the EA, in terms of ex-post **real interest rates** (the policy rate deflated by headline inflation in the same period), there was a temporary **sharp decline**, as the increase in the nominal policy interest rate was outweighed by rising inflation. In this sense, Czech monetary policy was not tighter than in the advanced EA countries (and nominal hikes were stopped prematurely).

Moreover, one also needs to take into account the different degree of **fiscal stimulus** (large in the Czech case).

5. Monetary policy response delayed

Loss measured by weighted sum of inflation and output variability



k denotes lag of policy actions, phi is aggressiveness of rule, rho is smoothing

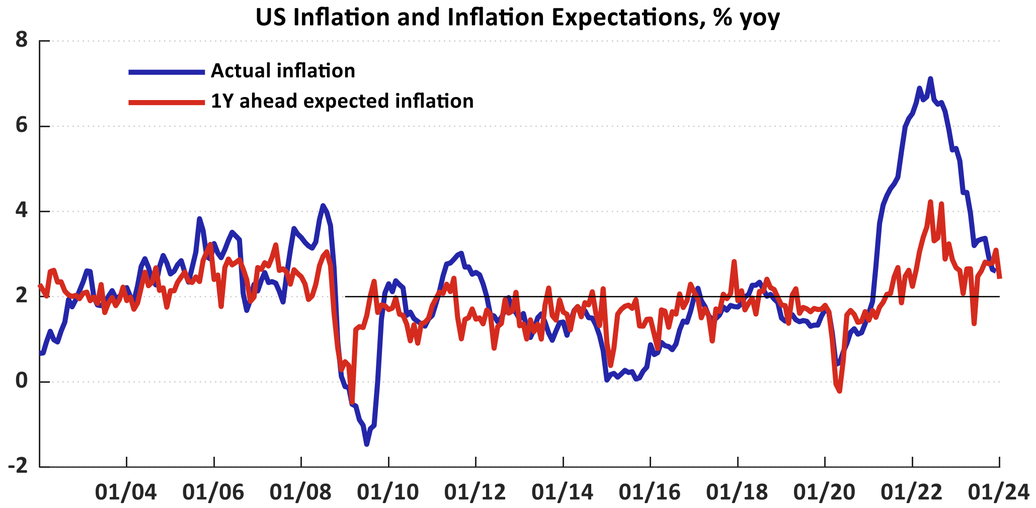
Source: Hakamada and Walsh (2024)

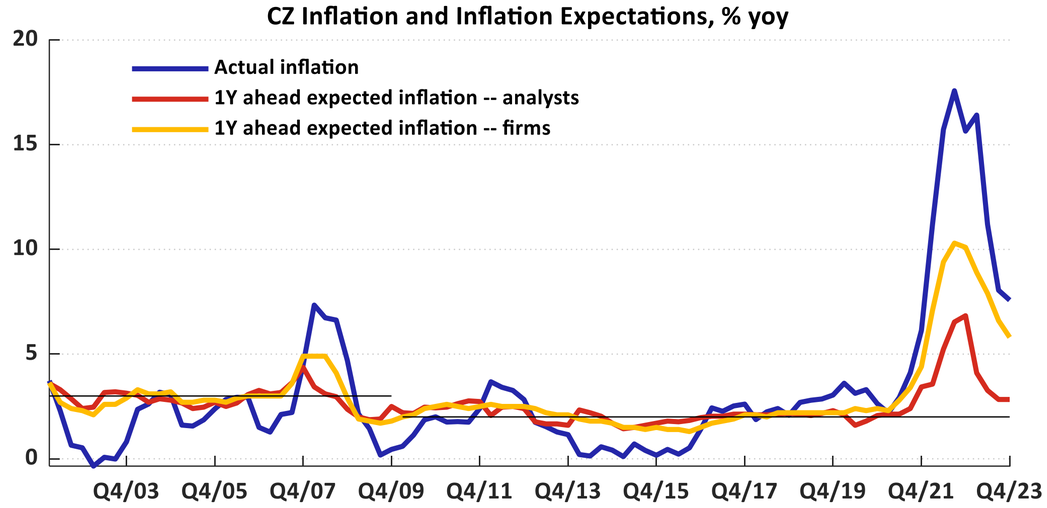
Hakamada and Walsh (2024) show:

- Delaying the policy response is costly in terms of inflation and output variability.
- The costs of a delay in the policy response to rising inflation are monotonically increasing in the length of the delay.
- The costs of a **short delay** can be eliminated partly by adopting a **less inertial** policy rule and a **more aggressive** response to inflation

Isn’t “high for long” as dangerous as “low for long”?

6. De-anchoring of inflation expectations





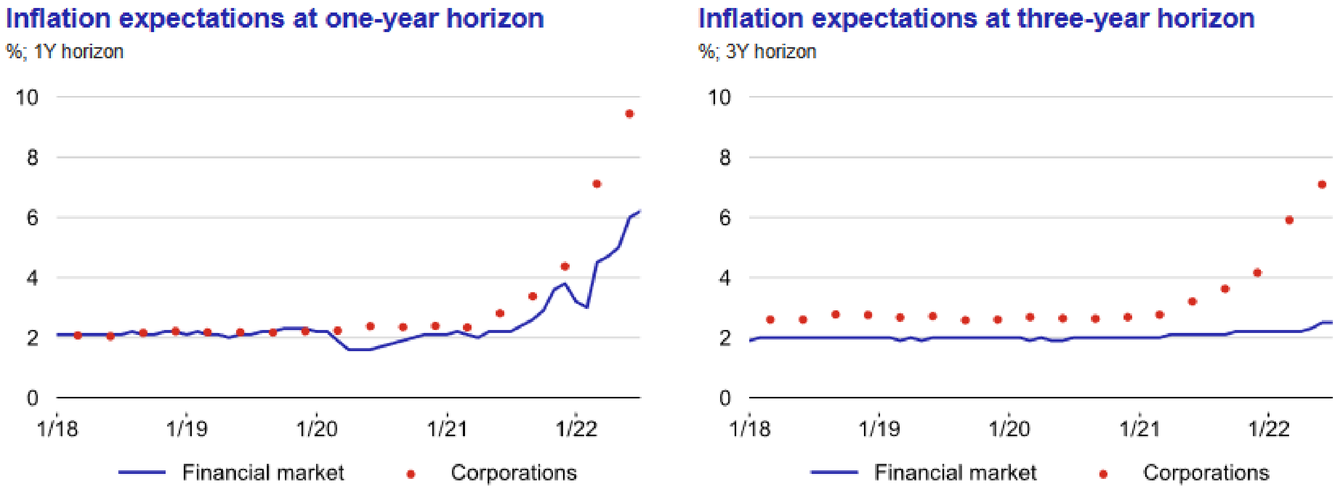
Source: FRED and CNB

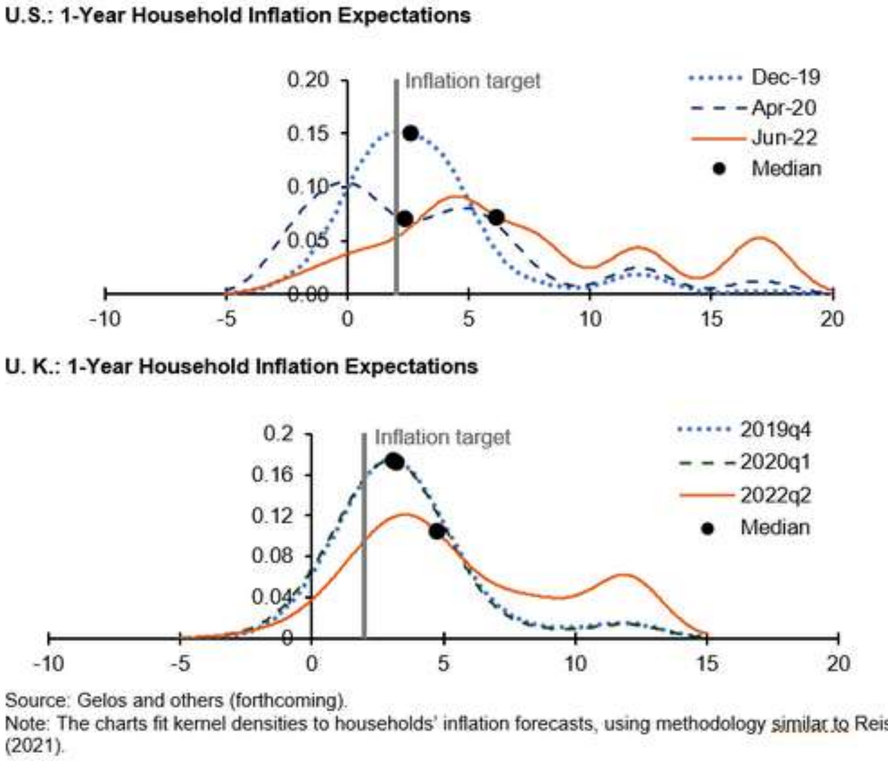
Inflation expectations had been hovering around the target at the one-year horizon prior to the recent inflation surge. However, the high inflation and consequently large and relatively long-lasting deviations from the target pushed expected inflation above the target.

High and persistent inflation expectations would raise the real costs of disinflation and call for tighter monetary policy in general.

Expectations seem **quite backward-looking and partially anchored** by the inflation targets.

6. De-anchoring of inflation expectations (cont.)





Source: Gelos and others (forthcoming).
Note: The charts fit kernel densities to households' inflation forecasts, using methodology similar to Reis (2021).

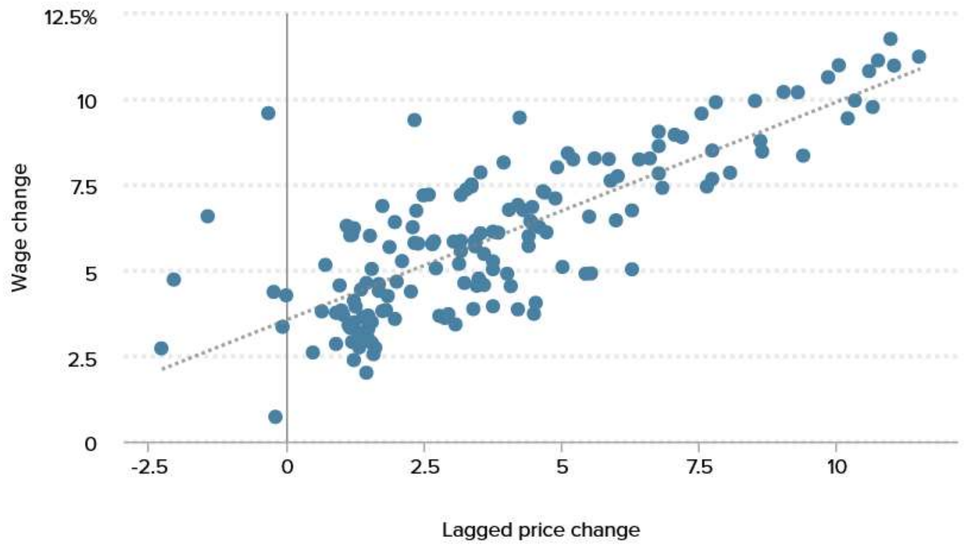
Higher average inflation expectations are also associated with **increased dispersion** of expectations across economic sectors and economic agents.

This may have real economic costs (on top of the inflation persistence issue).

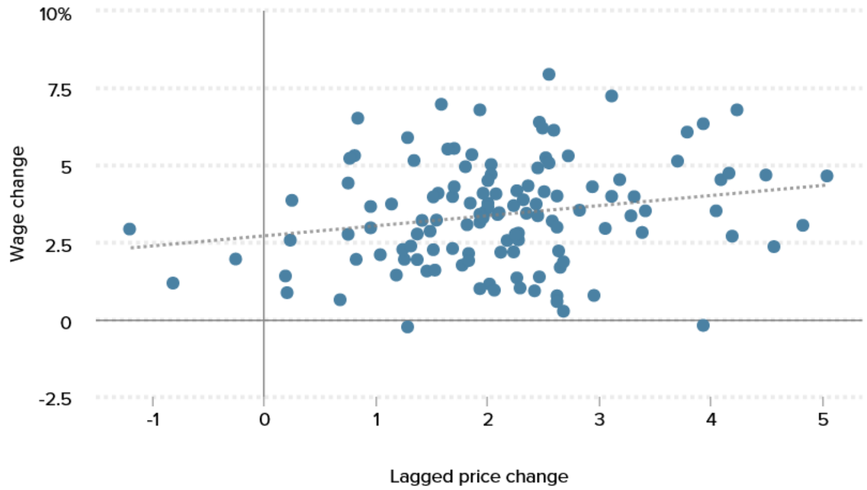
7. Benign nominal wage growth

Inflation and wage growth in the US

Wage growth and lagged (2-quarter) inflation in two periods, 1954–1988



Wage growth and lagged (2-quarter) inflation in two periods, 1989–2019

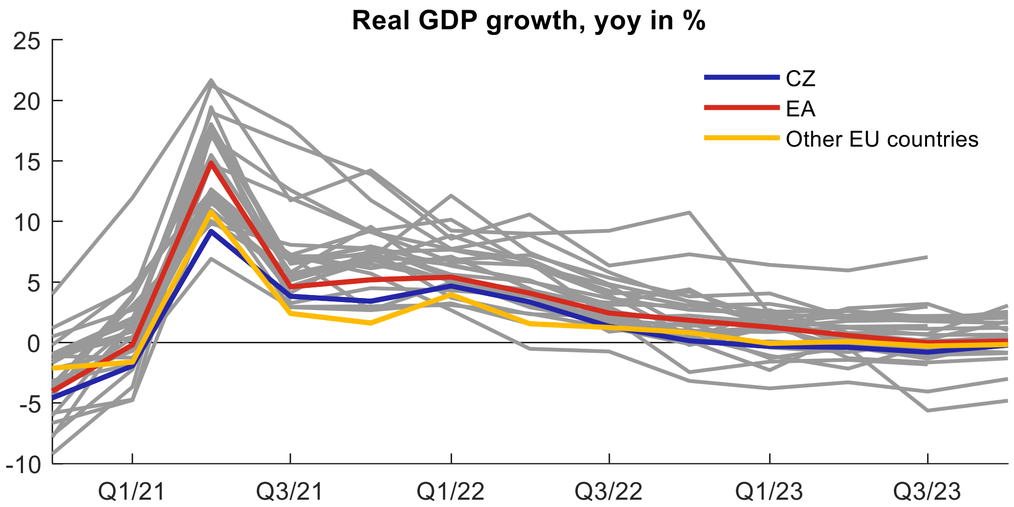


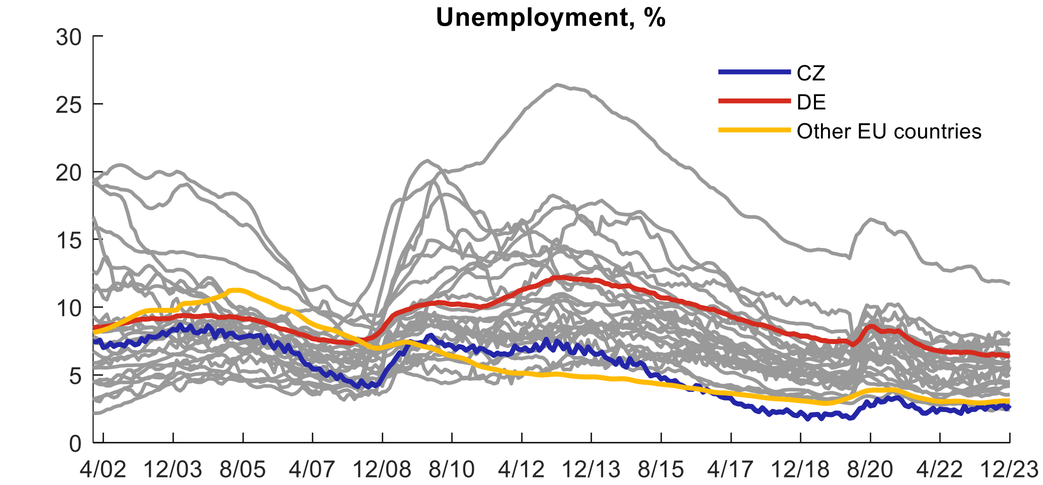
Source: Bivens and Banerjee (2024)

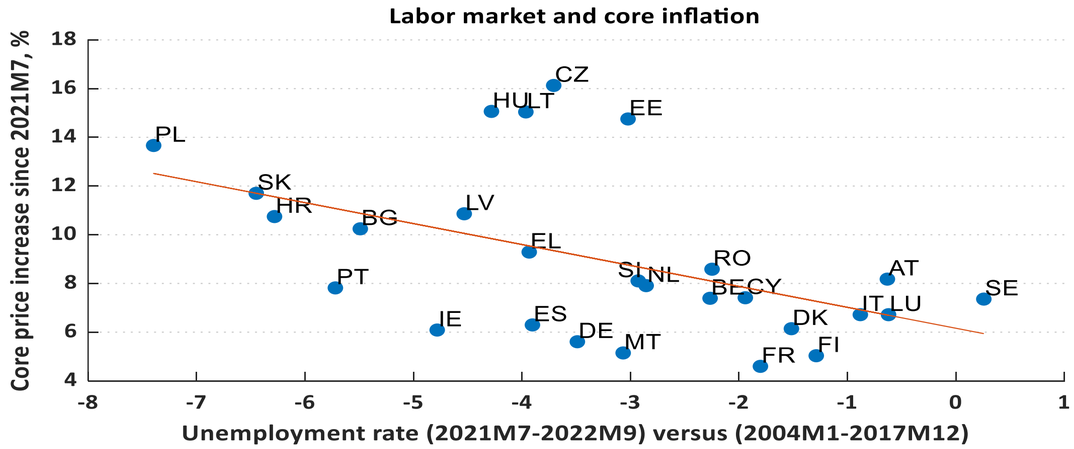
Despite unemployment rates being at historical lows, nominal wage growth has so far been moderate. As a result, the real wage is reviving only gradually.

Recent decades have seen an erosion of wage responses to inflation shocks despite tight labour markets. What are the factors behind this? As long as nominal wage growth adjusts only partially to price shocks, wages have a dampening effect on inflation.

8. Real economy







Source: Central banks and Eurostat

Can **disinflation** be benign with respect to real economic growth (“soft landing”)?

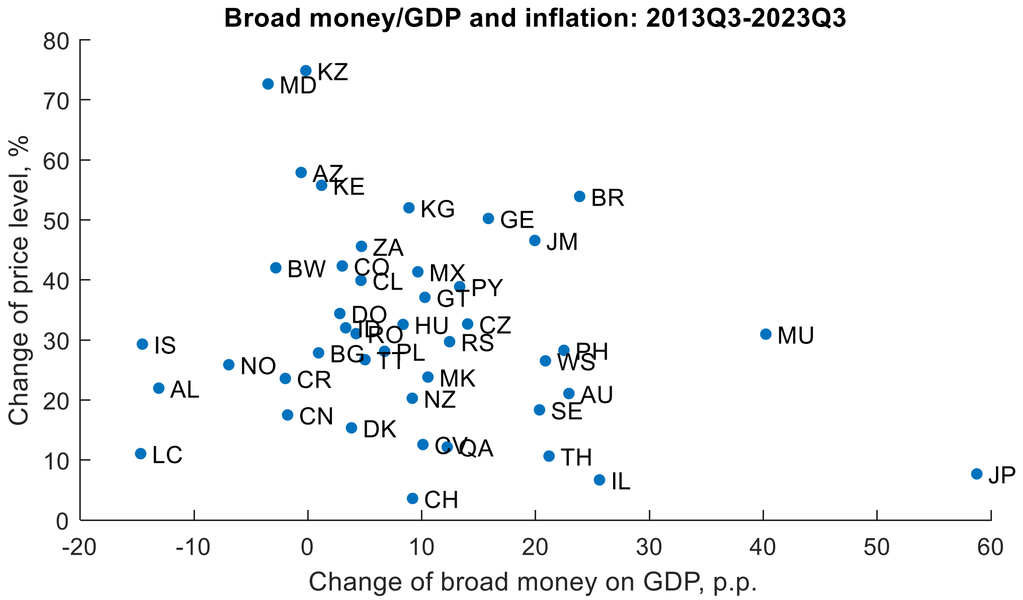
Tight monetary policy has not led to significant real economic slack so far. Real GDP growth has declined, but there has only been a stagnation or a mild recession. **Unemployment rates** have remained close to historical lows.

Tighter labour markets are at least weakly associated with higher core inflation rates.

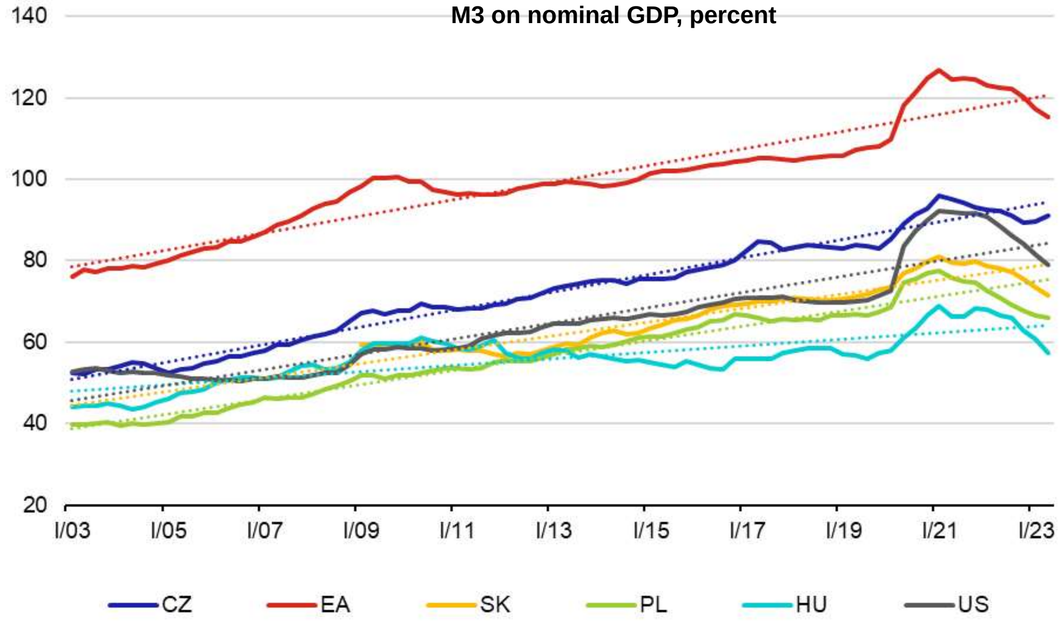
Did central bankers overlook anything?

1. Does money matter?
2. Does the size of the central bank’s balance sheet matter?
3. How strong is the synergy between MP and fiscal policy?
4. Have we missed some important non-linearities?
5. How do we deal with the high level of uncertainty?

1. Does money matter?



Source: IMF database

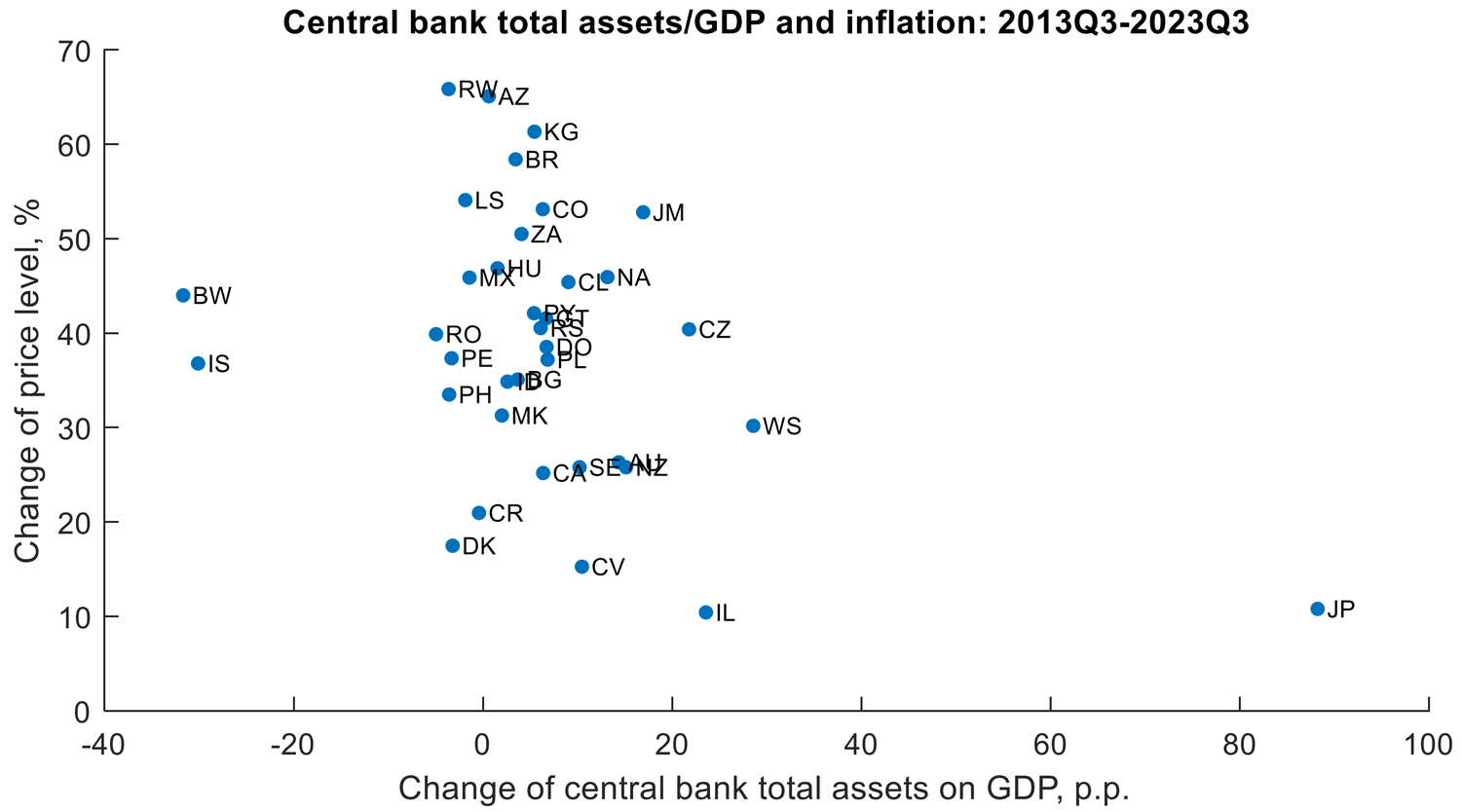


Source: Central banks and statistical offices

There is **no clear empirical link between broad money growth and inflation**.

Efforts to portray the previous unconventional monetary policy period as a “huge money-printing exercise” that inevitably led to high inflation, with Covid and the war in Ukraine being just its triggers, have no backing in mainstream economic theory or in empirical observations.

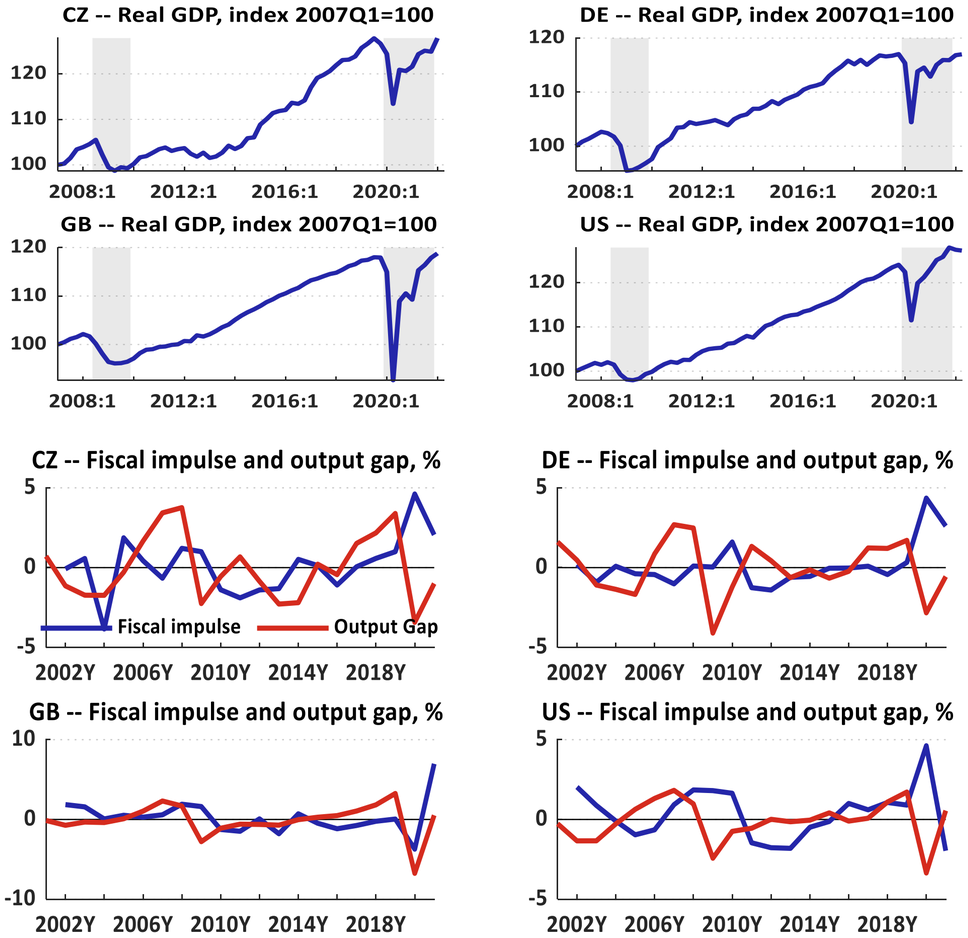
2. Does the size of the central bank’s balance sheet matter?



Source: IMF database

Nor is there any clear link between **inflation and the expansion of central banks’ balance sheets**.

3. How strong is the synergy between MP and fiscal policy?



The GFC led to an **L-shaped recession**, while the Covid shock was characterised by a **V-shaped recession** with a rapid return of real GDP to the pre-pandemic levels.

Besides the different nature of the shocks, the different dynamics of GDP and inflation might also reflect a **quick and simultaneous easing of monetary and fiscal policy** (too much of a good thing).

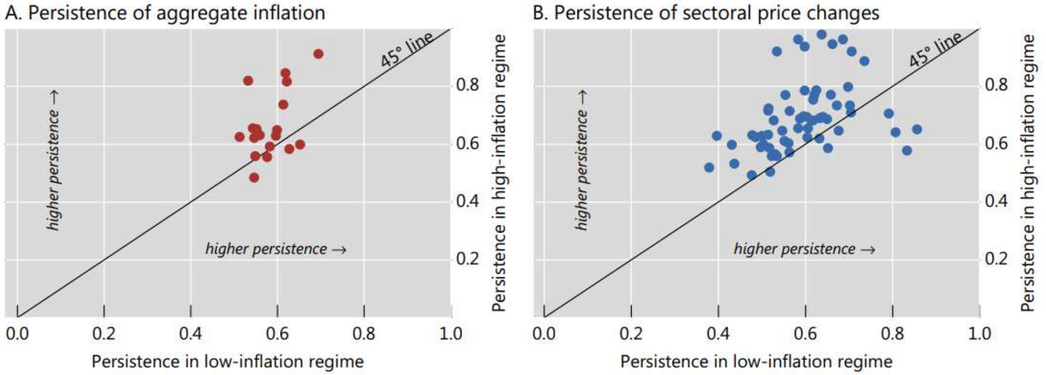
Strong synergy between monetary and fiscal stimulus (recall the HDoM debate). But would it have been as inflationary had there been no strong adverse supply-side shocks?

The primary goal of **monetary policy** should be to **ensure price stability.**

Source: Central banks, WEO, author's computations
Note: Fiscal impulse approximated by changes in structural deficits. Output gaps estimated using HP filter.

4. Regime-switching in inflation?

Low-inflation regimes: price changes are less persistent[1] Graph 8



[1] Persistence of one-month log price changes computed using sector-level data. Measure of persistence based on Dias and Marques (2010). High-inflation regime samples: CA, Dec 1971–Dec 1990; JP, Dec 1970–Dec 1979; KR, Dec 1985–Dec 1997; MX, Jan 1983–Dec 2002; US, Jan 1965–Dec 1985. Low-inflation regime samples: CA, Jan 1991–Dec 2019; JP, Jan 1980–Dec 2019; KR, Jan 1998–Dec 2019; MX, Jan 2003–Dec 2019; and US, Jan 1986–Dec 2019.

Source: Borio et al. (2022)

Note: Each point represents one country, where the persistence of inflation in a low-inflation environment is on the x-axis and its persistence in a high-inflation environment is on the y-axis. Most of the points lie above the 45-degree line, i.e. inflation persistence is on average higher in a high-inflation environment than in a low-inflation environment.

Recall the **Lucas supply curve** (imperfect information model):

$$y = \frac{1}{\gamma - 1}\frac{V_r}{V_r + V_p}\left[p - E(p)\right] \equiv b\left[p - E(p)\right]$$

The **rational inattention** approach may justify regime-switching in people's beliefs/expectations.

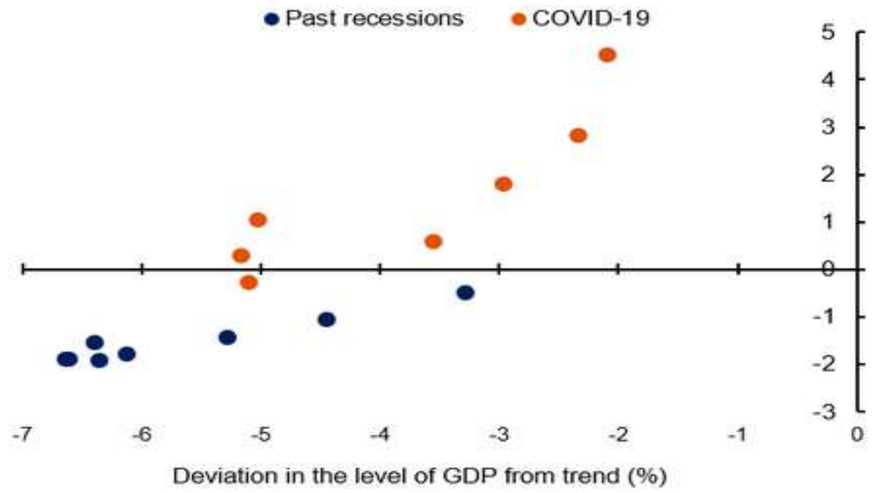
Borio et al. (2022) claim that **high-inflation periods** are characterised by **higher persistence** of inflation than low-inflation periods.

The higher persistence of inflation in a high-inflation environment may also result from **price indexation** and elevated **inflation expectations**.

4. Non-linear Phillips curve?

Core Inflation: Deviation from Trend

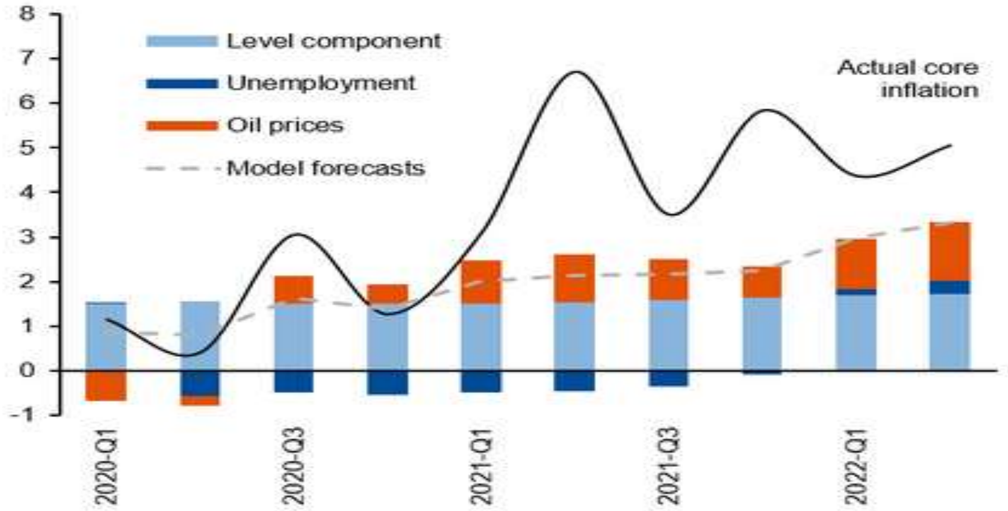
(Percent, quarter-on-quarter, annual rate)



Sources: Gudmundsson and others (forthcoming), Haver Analytics, IMF staff estimates.
Note: Average response of core inflation and level of GDP to past recessions between 1990 and 2022Q1 estimated using local projections on a panel of 30 advanced economies. The chart shows the average estimated responses in the first seven quarters after the start of past recessions. For COVID-19, it shows the estimated responses from 2020Q3 to 2022Q1.

U.S. Core Inflation: Out-of-Sample Forecasts

(Percentage points, quarterly average, annual rate)

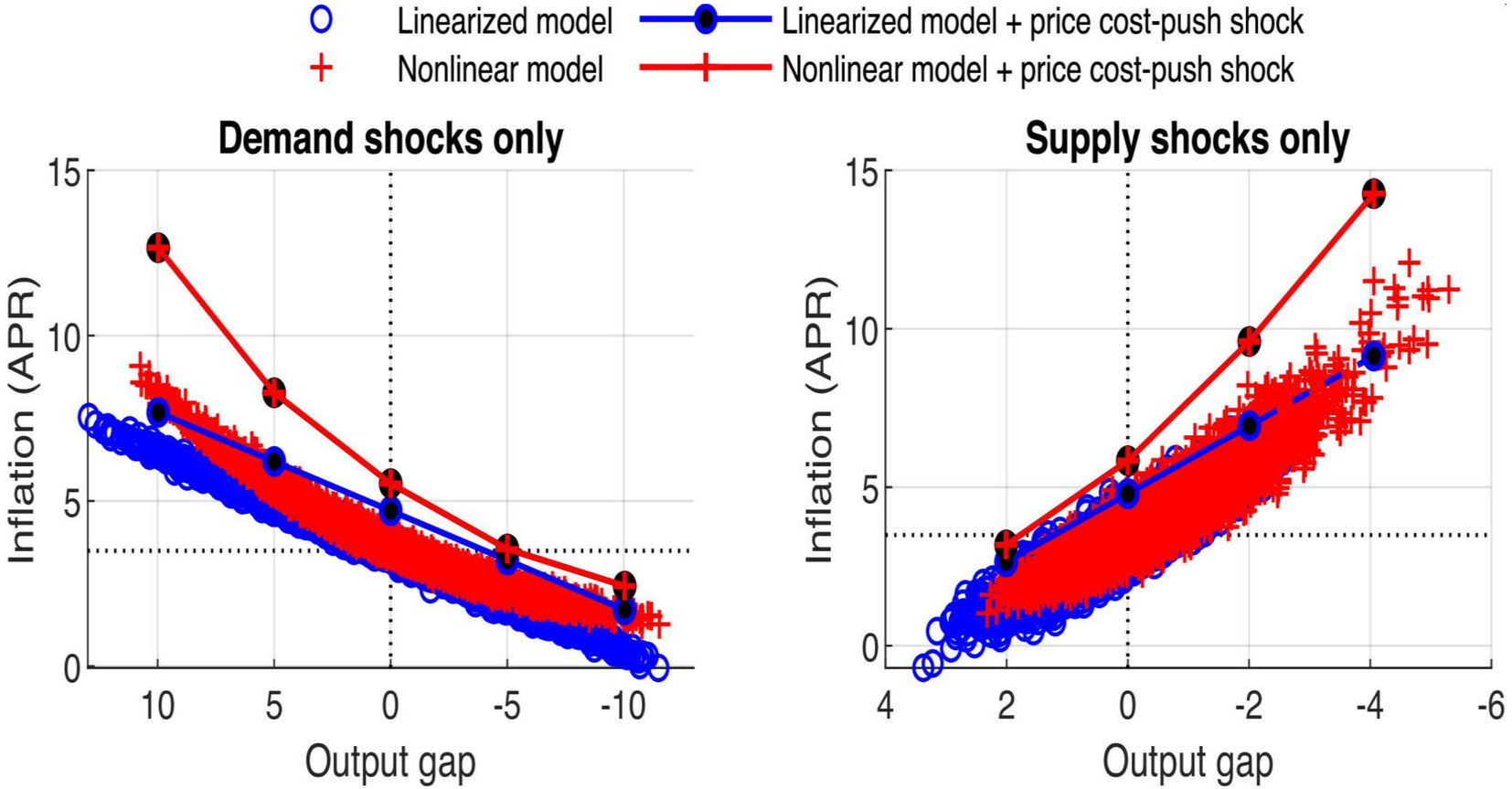


Source: IMF staff estimates based on model of Hooper, Mishkin, and Sufi (2020).
Note: Forecast based on 1960-2019 estimates. The 'Level component' includes the effects of lagged inflation, long-run expectations, and deterministic model components on the forecast.

There is a false belief that Phillips curves are extremely flat based on experience after the GFC and supported by some empirical findings – **flat PCs do not explain the recent inflation surge.**

Inflation forecast undershooting can be explained only partially by wrong external assumptions. An ex-post evaluation suggests that **nonlinearities** might have been overlooked, along with the **false assumption about PCs flattening.**

4. Non-linear Phillips curve? (Harding et al.)



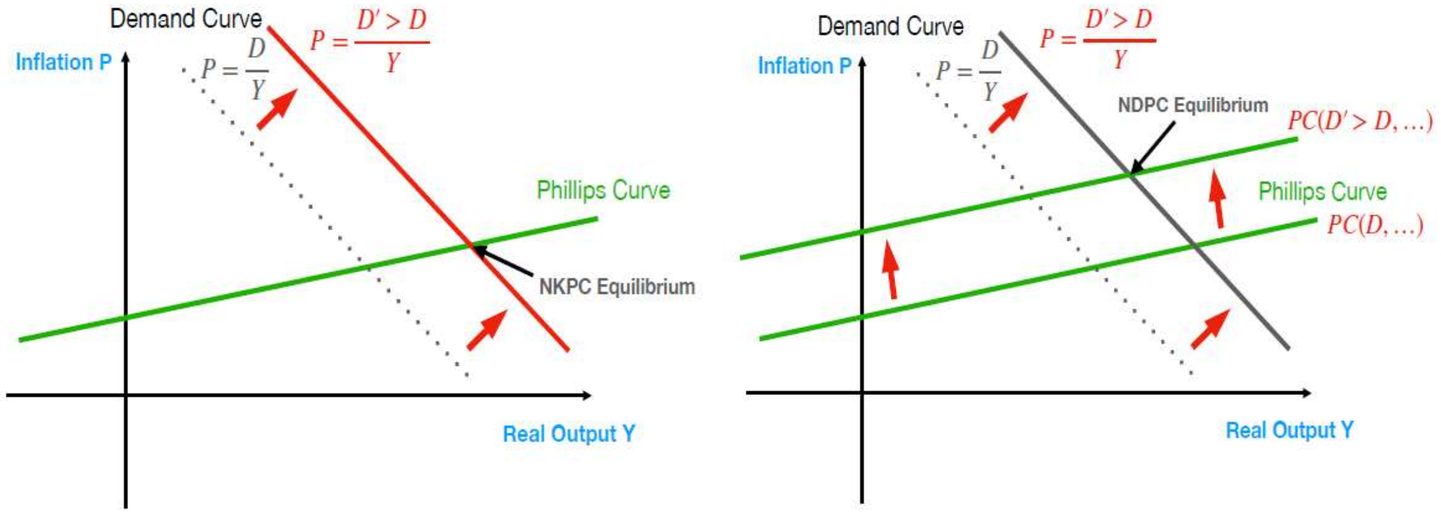
Source: Harding et al. (2023)

Model based on a **quasi-kinked demand** curve (demand elasticity is an increasing function of prices).

Quasi-kinked demand **implies a convex Phillips curve** in a non-linear model.

This leads to **higher pass-through of cost-push shocks** during inflation hikes, irrespective of whether they are demand- or supply-driven.

4. Shifts in Phillips curve? (Hagedorn)



(a) NKPC: Only Demand curve shifts (b) NKPC: Both Demand and Phillips curves shift

Figure 1: Nominal Demand shift $D' > D$: NKPC and NDPC

Note - D: Nominal Demand; Y: Real Output; P: Price Level (=Inflation for $P_{-1} = 1$);
Panel (a): Nominal demand increase from D to D' shifts the demand curve $P = D/Y$ along the Phillips curve. The NKPC equilibrium is located on the (non-shifted) Phillips curve.
Panel (b): Nominal demand increase from D to D' shifts the demand curve $P = D/Y$ rightwards *and* the Phillips curve upwards. The NDPC equilibrium is located at the intersection of the shifted demand and the shifted Phillips curve.

Model assuming state-dependent pricing in the presence of menu costs.

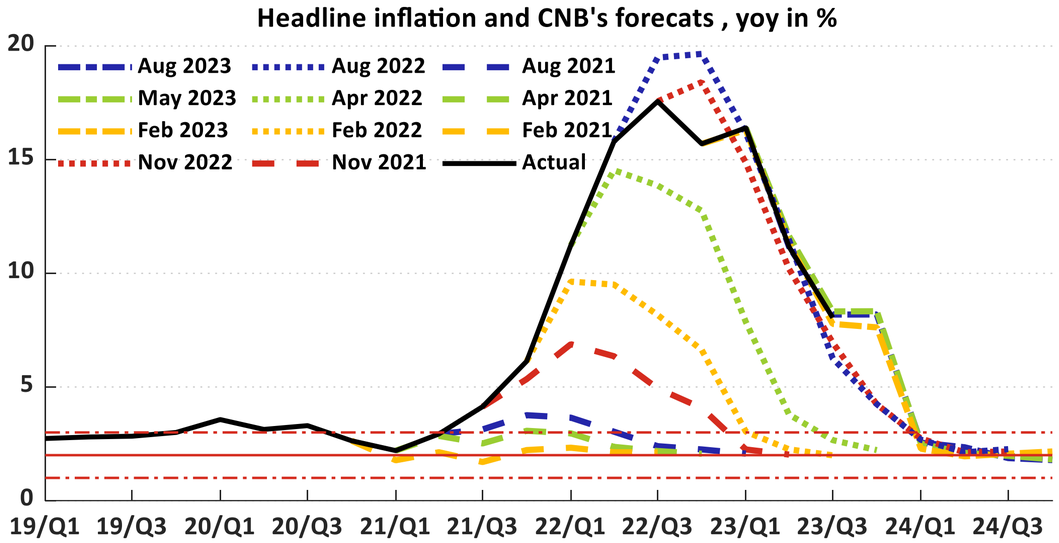
This leads to a **nominal demand-augmented Phillips curve (NDPC)**.

Large **shocks to aggregate demand shift the PC up**, leading to a more pronounced inflation increase.

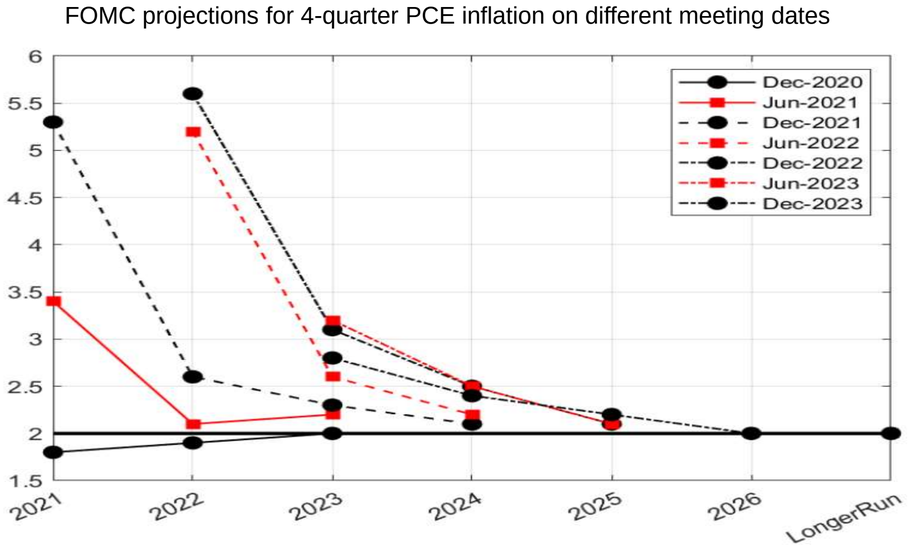
My remark: observationally, this could be equivalent to a non-linear PC or to a shift in the PC due to higher inflation expectations.

Source: Hagedorn (2023)

5. How do we deal with the high level of uncertainty?



Source: CNB



Source: Hakamada and Walsh (2024)

The assumption of a flat PC and well-anchored inflation expectations contributed to underestimation of the inflation spike.

Monetary policy conduct based mainly on **certainty equivalence** – responding to the mean of the projections – is optimal only if uncertainty is additive.

However, the risks are now high and non-additive – a **prudential approach** to monetary policy might serve better.

Preliminary policy lessons

Preliminary lessons learned

Although the Covid shock and the war are sort of tail events, they have **tested our monetary policy frameworks**.

The strategy of **"running the economy hot" should be revisited** based on the current experience of large and long-lasting deviations from targets, as **the costs might be higher than the benefits**.

> The synergy between monetary and fiscal stimulus should not be underestimated. Disinflation is costly and the costs rise with increasing de-anchoring of inflation expectations. The response to rising inflation may not be timely enough in practice.

Back to basics given the 1970s and 1980s experience – **mistakes leading to the Great Inflation and success during the Great Moderation**.

High uncertainty about future developments calls for a **prudential approach** to monetary policy (but prudential does not always mean less decisive; sometimes it means quite the contrary).

However, central banks' focus on **price stability** should be preserved, with **systematic and time-consistent policy actions**.

High for long might be as costly as low for long (but we should not declare premature victory).

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Thank you for your attention

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