Fighting Inflation within the Monetary Union and Outside: The Case of the Visegrad 4*

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The post-pandemic inflation surge tested monetary policy frameworks around the world. It was a particular test for the four Visegrad countries (V4) in Central-Eastern Europe, which provided a "natural experiment" to examine monetary policy outcomes under two different monetary regimes. With broadly similar economic characteristics, Slovakia was already in the Economic and Monetary Union (EMU) before the post-pandemic inflation hit, whereas the other three countries (Czechia, Hungary and Poland) were not. What was the inflation performance of the V4 countries under the two different regimes? What does this imply for the cost/benefit analysis of euro adoption for countries which are still outside the euro area? We find that EMU membership was beneficial both during "normal times" as the benefits of monetary sovereignty for small, open, integrated economies faded away, and particularly helpful during crisis times.

Journal of Economic Literature (JEL) codes: E02, E31, E42, E52, E58, F02, F31

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1. Introduction

Following the global financial crisis (GFC) of 2008–2009, inflation in the euro area was very low and in some cases even negative. Slovakia joined the EMU during the GFC, first navigating its way through the demanding context of the global crisis and then the euro area's own crisis. Along with the rest of the EMU, Slovakia later entered the pandemic with one of the lowest levels of inflation on the continent and certainly in CEE.

The post-pandemic inflation period tested monetary frameworks across the globe, with satisfactory results overall. After a spectacular surge in inflation in 2022–2023, most advanced and emerging market economies have since brought inflation back

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down close to their central banks' target. However country experiences differed. Early monetary policy tightening in response to rapidly rising inflation allowed for gradual interest rate increases. This brought down inflation earlier, allowed for a timely reversal of policy tightening, avoided risks to banks and financial stability more broadly, and made policy communication to the public clearer. This was the approach in most emerging market economies (*Nagy Mohácsi et al. 2024*). By contrast, delays in policy tightening may have kept inflation higher for longer and necessitated steep interest rate increases in a short period of time. This was the policy approach in advanced economies such as the US, UK, Australia and the euro area. In some parts of the world, this led to financial sector stress, as it did in the US in March–April 2023.

The handling of the post-pandemic inflation surge was a new experience for mature EMU members, which had not seen high inflation in a generation. By contrast, the CEE euro area members – Slovenia, Slovakia, the Baltic states, and the soon-to-be-member Croatia – did have more recent high inflation experiences from the turbulent initial years of transition from centrally planned to market economies in the 1990s.

The purpose of this paper is to take a closer look at this recent period of high inflation in the CEE region, which experienced a sort of "natural experiment" with structurally similar countries living under two different monetary regimes: Slovakia as an EMU member and Czechia, Hungary, and Poland as countries with independent monetary policy. We consider how this episode informs us with regards to the complex issue of the pros and cons of euro adoption in the small/medium-sized, open economies of the CEE region that are still outside the euro area.

2. Review of literature

We start with the literature that analyses the impact of euro adoption itself on long-term inflation and inflation expectations. There are several studies looking ex-post at the initial price effects of euro adoption. These effects can come for example from the rounding up of prices, but tend to be rather limited, amounting to a maximum of half a percentage point price increase (see *Pufnik 2017* for an overview). Consumers may, however, perceive prices as much higher after the changeover, resulting in a stronger rise in perceived inflation and inflation expectations.

From a medium- to long-term perspective, however, these effects are not particularly important. Empirical studies looking at the impact of euro adoption on long-term inflation developments are, however, limited. A recent model-based paper by *Dreyer and Schmid* (*2020*) does not find any clear evidence for an upward or downward effect of euro membership on inflation. The relative scarcity of such studies is likely due to the extended period of very low inflation in Europe in the wake of the GFC.

Turning to the long-term impact of the 2009 euro adoption on economic developments in Slovakia, several analyses look at the macroeconomic impact of euro area membership but none focus on inflation – perhaps because post-GFC inflation was so low. Using a systemic control group approach, *Žúdel and Melioris* (*2016*) estimate that euro adoption resulted in a 10-per cent higher real GDP level by 2011, although much of that gain had already materialised before euro adoption, reflecting at least in part Slovakia's long-standing goal to adopt the euro as soon as early as possible. *Gunnella et al.* (*2021*) deploy a gravity model to look at the impact of euro adoption on trade. They find that in total trade increased between 4.3 per cent and 6.3 per cent in countries which adopted the euro and that this trade-creation effect is strongest in countries which adopted the euro after its launch in 1999, including Slovakia. *Bruha and Tonner* (*2018*) use a DSGE-model to look at the possible effects of euro adoption in Czechia. Drawing on the experience of other countries to calibrate their model, they argue that euro adoption would have positive effects on macroeconomic variables at the cost of an increase in nominal volatility. Meanwhile, other countries' records point to mixed economic growth results, for example for Portugal or Italy (*Kiss and Marincsák 2020*). All studies stress that euro adoption is *not* a substitute for sustained structural reforms that are crucial to maintain or improve competitiveness and thus long-term growth.

3. Post-Covid inflation in the EMU and V4 countries

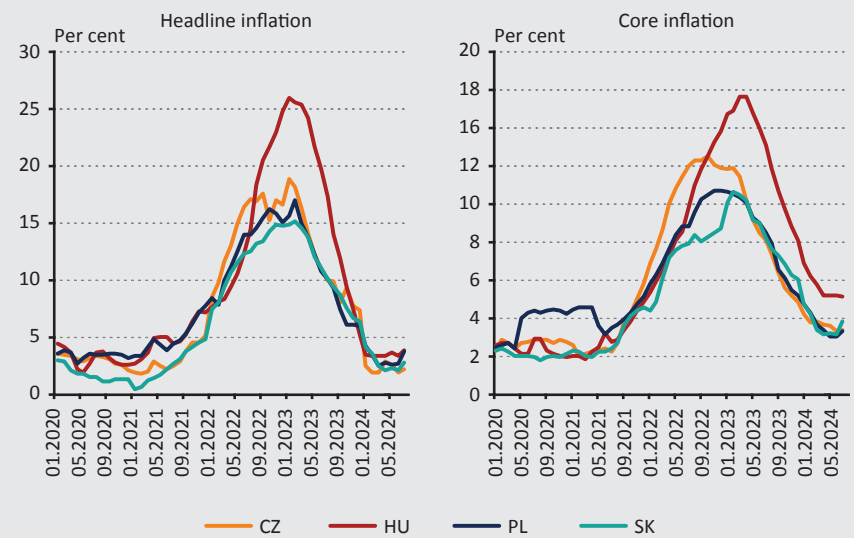
It is important to note at the outset that *within* the euro area, the CEE countries – Estonia, Latvia, Lithuania, Slovakia, Slovenia and Croatia – had considerably higher post-pandemic inflation rates than the euro area average. *Falagiarda* (*2024*) explains this with two major factors. First and most important, there are significant differences in economic structure between the CEE countries and the rest of the euro area. These structural differences relate to higher exposure to global shocks such as disruptions in global value chains and the economic consequences of Russia's invasion of Ukraine. Also, the share of energy and food in CEE consumption baskets is higher than the euro area average, making measured and experienced inflation higher other things being equal. Additionally, CEE economies are more deeply integrated into global supply chains, which translates into higher sensitivity to supply bottlenecks – as it did during the post-pandemic inflation period. Second, domestic demand pressures also played some, though more limited, role. In this regard, Falagiarda points to higher unit profit increases in CEE euro area countries than elsewhere, linked, *inter alia*, to less competition. More importantly, labour market conditions are tighter in CEE than elsewhere in the euro area. Low unemployment rates and massive outward emigration from CEE countries to the rest of the EU have resulted in large wage increases in excess of productivity growth – particularly as the young and more skilled left — creating upward price pressures.

How can policy makers react to such differences within a monetary union? As ECB monetary policy cannot react to country-specific differences, fiscal and structural policies must bear the brunt of the necessary adjustments.

3.1. Trends in V4 countries

Headline inflation, as measured by the Harmonised Index of Consumer Prices (HICP), started to rise almost at the same time in the four Visegrad countries in the fall of 2021, albeit from higher initial levels in the three non-EUR countries compared to Slovakia. Hungary's inflation was already at the top of central bank's inflation target of 3 per cent (with +/- 1 per cent tolerance band) at the beginning of the period (*Cohn-Bech et al. 2023*). Core inflation also started to rise in the fall of 2021, except for in Poland where core inflation was already elevated in the spring of 2020 (*Figure 1*).

Figure 1
Inflation in V4 countries



Source: Eurostat

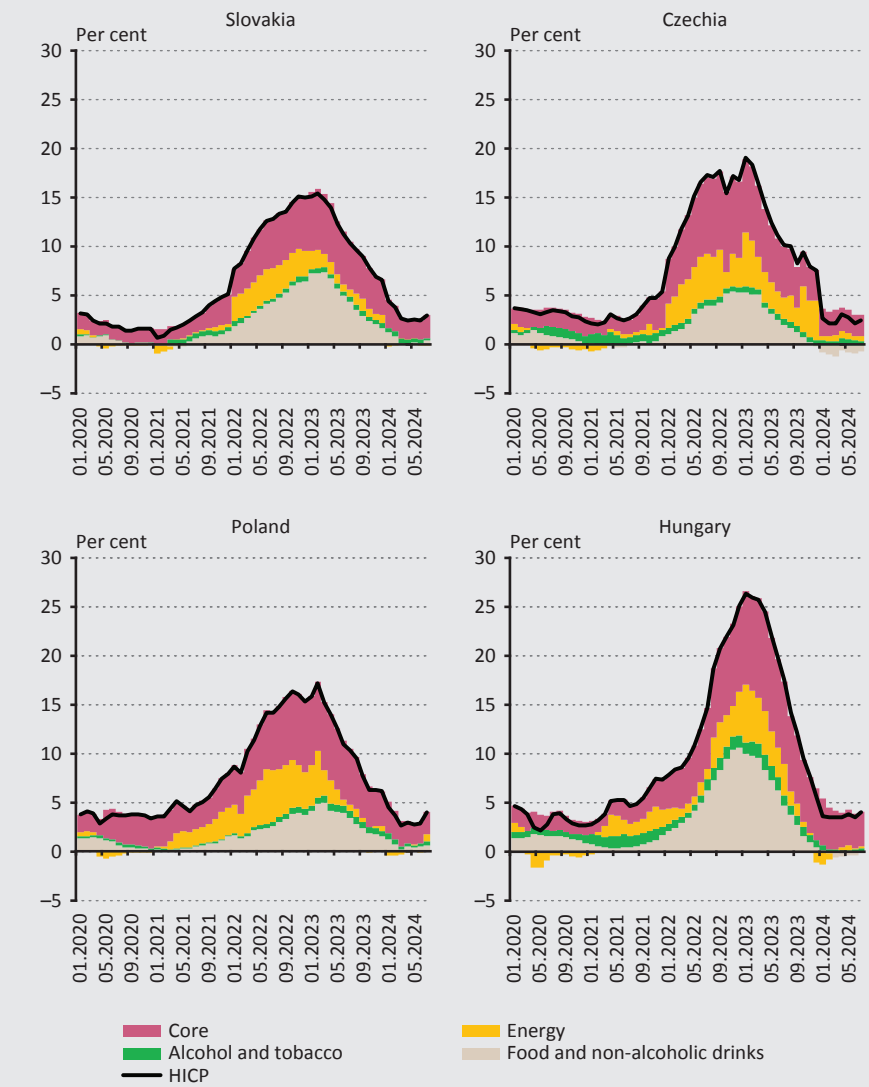
Hungary experienced the highest headline inflation among the V4 countries with over 25 per cent in late 2022. Inflation reached around 15–17 per cent in the other Visegrad countries as well, including Slovakia, where price increases were only a bit lower than in Czechia or Poland. All of these countries' inflation rates were significantly higher than the euro area's peak rate of slightly over 10 per cent in the fall of 2022.

3.2. Inflation components

What were the key inflation components in each country? The energy price shock in early 2022 appears to be a key driver of inflation in each country, particularly in Slovakia and Hungary (*Figure 2*). Food inflation played a particular role in Hungary and Slovakia, reflecting not only the impact of higher energy prices in the agriculture

and food processing sectors, but also drought effects and unfavourable weather conditions. Core inflation including all non-energy non-food items was especially high in Hungary, in line with its highest headline inflation, but it was also elevated in Czechia and Poland, and, to a more limited extent, in Slovakia as well.

Figure 2
Inflation components in the V4 countries

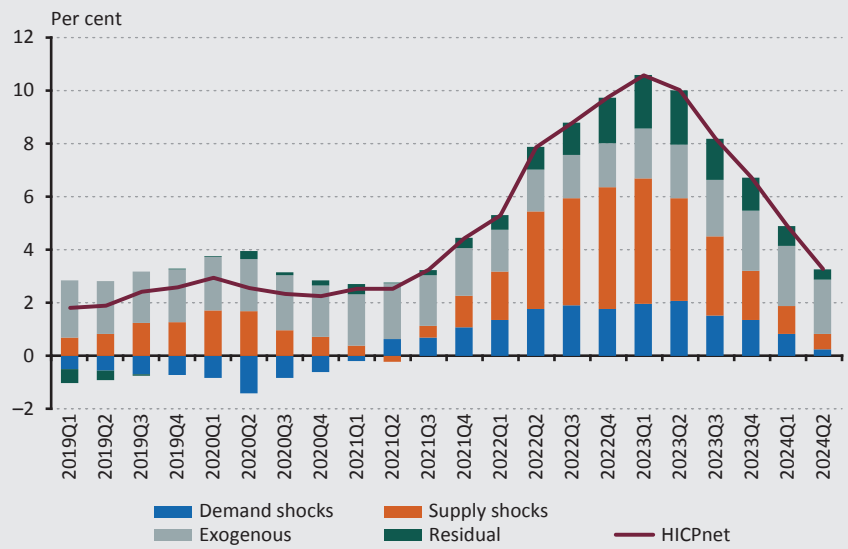


Source: NBS and authors' calculation

3.3. Decomposing supply and demand shocks – A "perfect storm"

Focusing on Slovakia, we calculate demand and supply side shock contributions to headline CPI inflation (*Figure 3*). In the period 2020–2023 we witnessed a "perfect storm". The Covid pandemic initially suppressed demand and limited supply in many ways, such as lockdowns, quarantines and social distancing measures. These led to disruptions in global supply chains to which CEE's globally integrated markets are particularly sensitive. Scarcities appeared, which in market economies can be a precursor to price increases. Fiscal measures implemented from the spring of 2020 to support households and enterprises added to demand pressures and increased imbalances in supply and demand. As vaccination became widely available, social distancing was curbed and supply constraints eased. But soon after Russia invaded Ukraine, another negative (energy) supply shock hit the economy, adding to the remaining positive demand shock from lingering pandemic measures and new expenditures to cushion the large energy price increases.

Figure 3
Slovakia: contributions to HIPC inflation (year-on-year)



Source: NBS and authors' calculations

4. Policy response

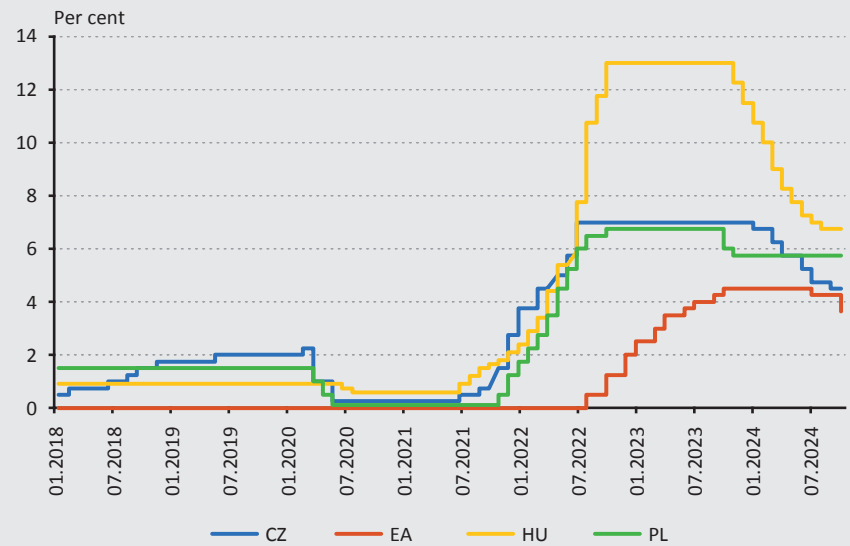
4.1. Monetary policy

Monetary policy responded to inflationary pressures earlier in the three non-euro area CEE countries than in the EMU member Slovakia (with a difference of up to a year) (*Figure 4*). As mentioned, this was in line with the observed global trend of emerging market central banks reacting faster to the rise in inflation than their advanced country counterparts, underpinned by improved monetary policy frameworks including in the CEE region (*Nagy Mohácsi et al. 2024; Balogh et al. 2024*).

Interest rates were raised to much higher levels in the three non-euro area countries than in the EMU/Slovakia. Given its record level of inflation, Hungary's interest rates increased the most. However, real interest rates remained negative for some time in all V4 countries, as well as in the euro area, the US and the UK.

Czechia and Poland experienced similar inflation rates to Slovakia, but Slovakia had lower nominal interest rates, resulting in more deeply negative real interest rates for some time. This could, in principle, lead to a decline in the real value of debt and thus more buoyant domestic conditions.

Figure 4
Policy rates in the Visegrad 3 and EMU/Slovakia



Source: National bank websites

Did Slovakia suffer in terms of fighting inflation because of the later and more muted monetary policy tightening by the ECB? Did ECB monetary policy lead to additional demand pressures in Slovakia relative to the other V4 countries? Inflation performance does not seem to suggest so. Inflation started to come down roughly at the same time in Slovakia as in the other V4 countries (except Hungary), confirming the finding that a larger part of the inflation was supply-shock driven. It may also imply that inflation expectations in EMU/Slovakia were better anchored than in the other countries.[1] A belated and smaller EMU monetary policy reaction was enough to bring inflation down roughly at the same time as in the other V4 countries. The common monetary policy does not seem to have penalised Slovakia by creating additional prices pressures or extending the high inflation period.

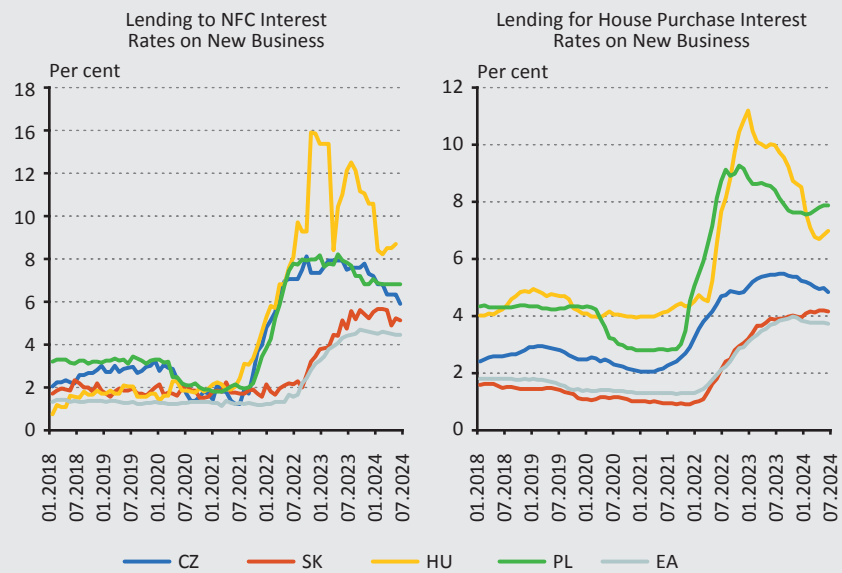
How did *monetary transmission mechanisms* work in the V4 countries? How fast and to what extent were the increases in interest rates passed through to prices of goods and services and assets, and did they impact financial and demand conditions?

The IMF's April 2024 Regional Outlook for Europe found that the financial condition index – which includes a host of financial variables such as corporate and sovereign spreads, interest rates, credit growth, equity and house price returns – in CEE and South Eastern Europe (SEE) showed tighter financial conditions *before* 2021 than in the rest of Europe, but conditions then loosened faster and deeper until mid-2023, *despite* the early start of monetary policy tightening in this region. This puzzling behaviour may point to weaker transmission mechanisms in the region and/or existing high domestic liquidity (*IMF 2024*).

Several factors may be behind this. Similarly to elsewhere in the world, banks passed through the increases in policy rates almost immediately to lending rates (*Figure 5*), but only with a lag in the case of deposit rates. This restrained bank lending, particularly for mortgages, while boosting bank profits. Households reacted to the belated deposit rate increases by switching into term deposits and shifting to treasury bills as fiscal financing needs increased, except for in Czechia (see below). Given that savings rates were already relatively high due to pandemic-related policies and rising fiscal financing needs, the limited pass-through into deposit rates did not hinder demand. Note also that in Hungary, for example, savings remained high for a longer period of time, similarly to other countries with higher uncertainty in the wake of a severe cost-of-living crisis and other uncertainties, such as in the UK (*Greene 2024*). Fiscal policy measures to limit price increases to safeguard consumers may have also weakened the effectiveness of the monetary transmission mechanism.

[1] More econometric work is needed to verify this point.

Figure 5
Lending rates for corporates and household mortgages in V4 countries



Source: NBS and authors' calculation

4.2. Exchange rate impact and ECB FX swaps and repos[2]

Currency developments also influenced inflationary paths. The currencies of the three Visegrad countries outside the euro area exhibited wide fluctuations against the euro (and also the US dollar), although less so for Czechia. The Hungarian forint and, to a lesser extent, the Polish zloty depreciated against the euro at the start of the pandemic in March 2020 and again after Russia's invasion of Ukraine, which fed into price increases (*Figure 6*).

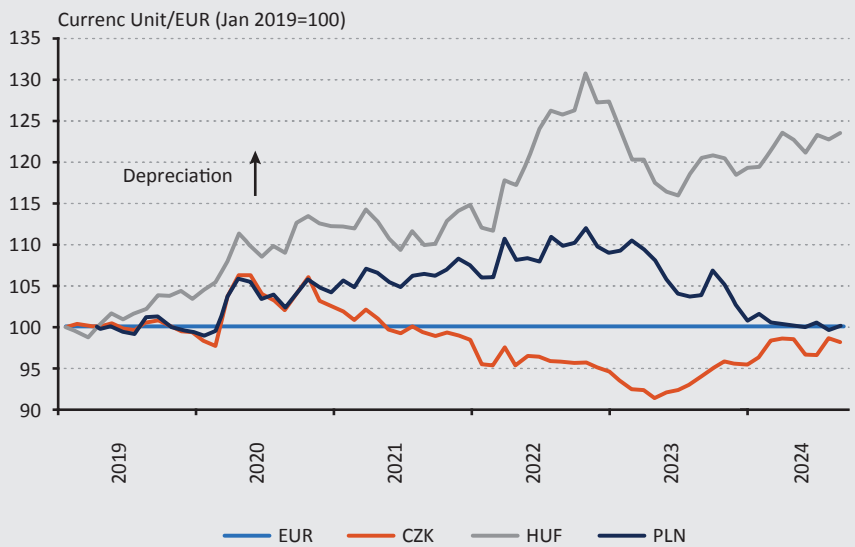
It is critical to highlight, however, that currency depreciations may have been much higher in Poland and Hungary (and several other CEE and SEE countries) without the ECB's foreign exchange swap and repo operations at the height of the market stress, such as in March–April 2020. During this stress period the ECB provided currency swaps – accepting the countries' local currency assets – for Croatia (still outside the EMU but almost in at that point) and Bulgaria (which has had its exchange rate de facto pegged to the German mark since 1997 and then the euro), as well as for Poland and Romania. Hungary received a foreign exchange repo operation, handing over euro-dominated long-dated assets in exchange for short-term liquid euro

[2] For a summary of the ECB's motivation behind its currency swap and repo operations, see *Panetta and Schnabel* (*2020*).

assets. Several non-EU countries such as Albania and North Macedonia received support similar to that of Hungary. All of this helped, though swaps are clearly much better than repos for the beneficiary countries. The criteria applied for offering swaps or repo operations seem to be quite heterogenous across countries.[3]

As an EMU member, Slovakia did not have to worry about exchange rate fluctuations against the euro, currency swaps and so on. The adoption of the euro and the backing of the ECB's massive balance sheet makes crisis management incomparably easier for small, open economies such as the V4 countries.

Figure 6
Currency movements vis-à-vis the euro



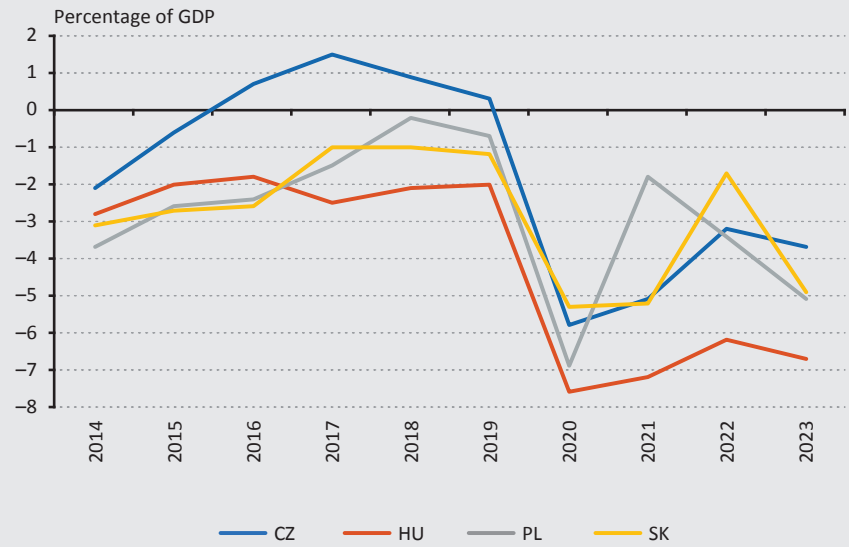
Source: NBS

4.3. Role of fiscal policy

Fiscal policy influenced the post-pandemic inflation surge in two important ways: (i) via expansionary fiscal policies, first related to pandemic support to households and businesses, and then via energy subsidies in the wake of the surge in energy prices following Russia's invasion of Ukraine (*Figure 7*); and (ii) by "providing shelter" to households and firms from the impact of monetary policy action, for example in the form of interest rate caps for certain activities or borrowers.

[3] For an assessment of the high usefulness of ECB currency swaps, see Croatian National Bank Governor *Vujčić* (*2020*).

Figure 7
Fiscal balance in V4

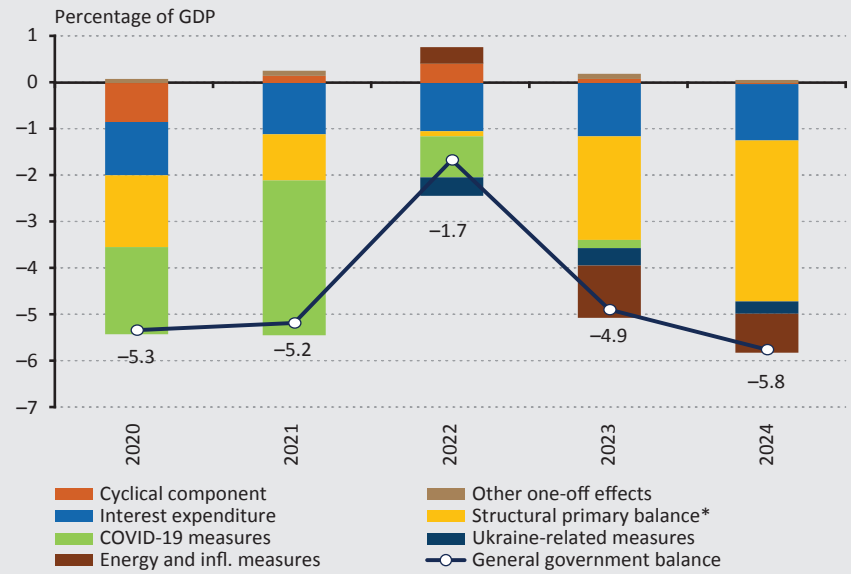


Source: Eurostat

The V4 countries entered the pandemic period with broadly balanced fiscal positions/small deficits. The pandemic crisis management measures increased fiscal deficit across the region in 2020–2021, and, except for Czechia, deficits persisted through 2024 due to subsequent measures to protect households and certain industries from the impact of surging energy prices and inflation.

Let us examine Slovakia's fiscal record in more detail. It has experienced elevated fiscal deficits since 2020 (except for 2022). As shown in *Figure 8*, the Covid measures of 2020–2021 were taken at a time when inflation was (still) relatively low. The deficit rose significantly in 2023–2024 on the back of mounting inflation that increased social benefit spending, direct energy support measures, new social measures and rising interest costs.

Figure 8
Slovakia: Fiscal balance decomposition



*Note: *Without Covid, Ukraine-related and energy measures*
Source: NBS, authors' calculation

In Poland, the "Anti-Inflation Shield" measures introduced in early 2022 – a reduction in VAT and excises on a range of food and service items – are estimated to have contained inflation temporarily for one year by some 4 percentage points (*IMF 2023*). In Hungary, limiting utility and energy price increases and related open and de facto subsidies were also significant. For example, the government specifically introduced caps on interest rate increases ("*kamatsapka*"), which weakened the pass-through of policy interest rate increases to prices; it also provided below-market interest rate loans under various government schemes (*Coen-Bech et al. 2023*). The only exception was Czechia, where significant fiscal consolidation took place in 2022–2024, supporting inflation reduction but also contributing to weaker domestic demand and growth. However, public debt levels remain, manageable in the V4, particularly in Czechia and Poland (44 per cent and slightly above 50 per cent of GDP, respectively).

4.4. Policy mix

A complete macro policy assessment requires a simultaneous analysis of monetary, fiscal as well as macroprudential (financial stability) policies,[4] with a focus on policy interactions and dynamics. We can distinguish three main periods since the GFC:

- In the aftermath of the GFC, fiscal and monetary policies – with the reinvention of quantitative easing (QE) — were counter-cyclical, while macroprudential policies had to tighten in response to previous excessive credit growth that had given rise to the GFC in the first place (among other factors).

- During the pandemic, by contrast, all three elements of the policy mix were highly counter-cyclical and massive in the face of hitherto unknown health and macroeconomic risks. Such coordinated loosening of policies worked, even though it was possibly applied longer than necessary, adding to global inflation pressures. Subsequent shocks from Russia's war on Ukraine and emerging geopolitical risks again necessitated some fiscal loosening.

- As post-pandemic inflation hit and central banks had to tighten monetary policy, looser fiscal policies made the inflation-fighting task of central banks much harder. This meant that monetary policy tightening had to be longer/interest rates higher than would have been the base without expansionary fiscal policies. Moreover, some of the fiscal measure such as caps on interest rates acted specifically against monetary policy, reducing the latter's effectiveness, necessitating higher interest rates for longer and making policy communication harder.

4.5. How about growth?

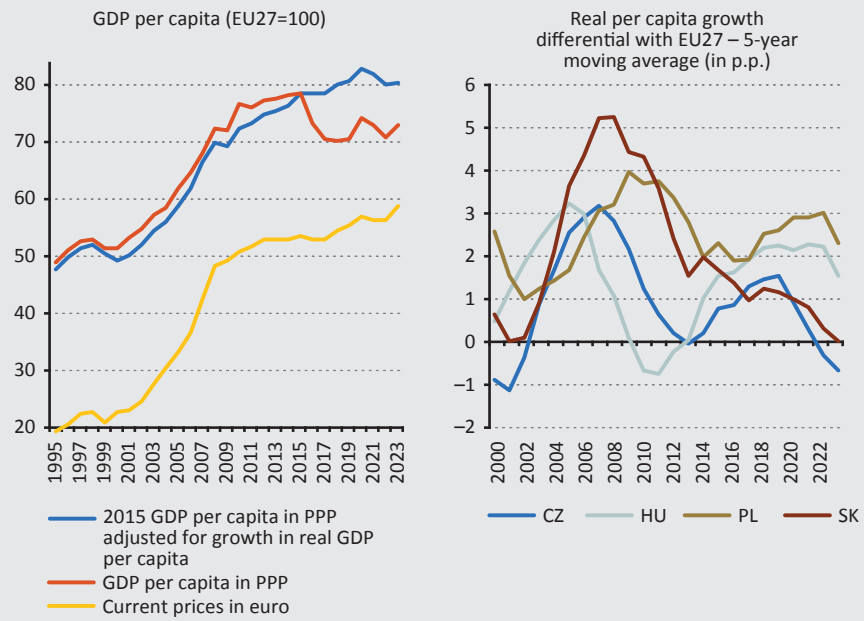
The V4 countries as a group have made remarkable progress towards convergence since their EU membership in 2004.[5] Recent studies prepared around the 20th anniversary of EU membership identify significant "European Union accession bonus" in the growth performance for the initial eight members that joined in 2004. The *EBRD* (*2024*) finds that compared to Germany, this group of countries observed a convergence of 24 percent in per capita income, of which 14 per cent is an "EU accession bonus", that gave rise to faster GDP and real income growth. *Grassi* (*2024*) similarly finds a significant "EU bonus" for this group of countries.

[4] Macroprudential policies have been upgraded and more integrated into the modern policy mix following the global financial crisis of 2008/2009. *Eller et al*. (*2020*) analysed macroprudential policies in the CEE-SEE region between 1997–2018. They find that a few had already used macroprudential policies extensively prior to GFC; and all used it extensively afterwards with building capital and liquidity buffers as well as better procedures which together tightened credit allocation. In their update that includes the pandemic period (*Eller et al. 2021*), they confirm strong reliance on loosening macroprudential tools to fight the fallout from the pandemic. These policies were gradually phased out as the pandemic receded.

[5] Romania and Bulgaria joined a little later in 2007 and Croatia in 2013.

However, within the V4 we observe some country differences with regards to growth performance and convergence. Convergence in Slovakia seems to have stalled, possibly along with Czechia, though it also slowed in other V4 countries (*Figure 9*).

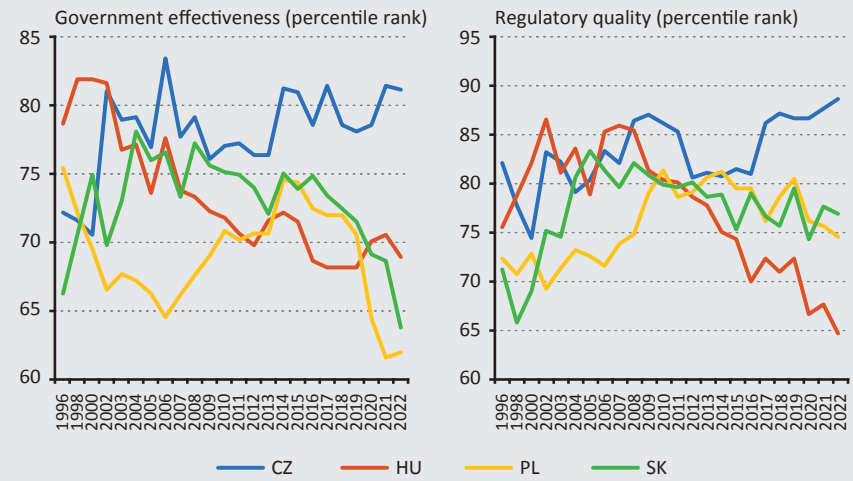
Figure 9
GDP per capita in Slovakia (left) and V4 countries (right)



Source: Grassi (2024)

Analysing the reasons behind this trend is beyond the scope of this study. Suffice it to say that productivity growth has declined in the past decade or so in the V4 countries (albeit this is a more general phenomenon). At the same time, public investment has for example "flatlined" in Slovakia, because EU funds tended to substitute rather than add to national public investment. In Poland and Hungary, public investment also declined, and there were at times issues with the ability to access EU funds, due to governance compliance issues. The business environment in terms of government effectiveness and, to some extent, regulatory quality may have also played roles in all V4 countries, except Czechia (*Figure 10*).

Figure 10
"Doing business" environment in the V4, 1996–2022



Source: World Bank, World Development Indicators

With sovereign monetary policy out, EMU membership puts a much bigger *onus* on national fiscal policies and structural-regulatory reforms. This is even more so the case for smaller economies, which often benefit from lower interest rates and more abundant liquidity than outside EMU. What EMU members do with this depends largely on the member countries themselves. Some have taken a proactive role to accelerate structural reforms and invest in human capital, such as Finland and Ireland. Others have taken a more complacent approach to reforms, which may be the case in Portugal, where convergence has stalled and reversed since EU membership (*de Souza 2024*), among others. The single most important lesson is to avoid complacency and take good advantage of available funding for productivity-increasing investment in human and physical capital as well as innovation in a more business-friendly environment.

5. Summary and concluding thoughts

We analysed the recent post-pandemic inflation period in the four Visegrad countries. Given their similar economic structures and context, the inflation surge under two different regimes – within the euro area's common monetary policy framework for Slovakia and outside EMU for the other three countries – can be seen as a "natural experiment" to test the impact of common monetary policy in small, open economies, compared to independent monetary and exchange rate policy.

Our findings are as follows:

- Slovakia, which adopted the euro in 2009, did not experience a boost in inflation upon euro adoption (similarly to other countries) and entered the pandemic and the post-pandemic inflation surge with the lowest inflation rate in the V4.
- Independent monetary policy does not appear to have added to monetary policy effectiveness in the V4 countries outside the EMU to address inflationary pressures. This is in line with research suggesting that small, open economies do not have much de facto monetary sovereignty when faced with the impact of decisions of systemic global central banks such as the US Federal Reserve and the ECB (*Rey 2015*).
- Central banks in the non-euro Visegrad countries started reacting to rapidly rising inflation earlier than the ECB by up to a year. They also raised their policy rates higher than the ECB in response to their much higher inflation rates, particularly in the wake of the Russian invasion of Ukraine. The currencies of Poland and Hungary depreciated at the height of the pandemic and after the Russian invasion. But this does not seem to have helped growth materially, while probably having a negative impact on inflation. By contrast, it appears that inflation expectations within the EMU were better anchored, given the ECB's institutional credibility and much larger balance sheet.
- Crisis management is significantly better and easier for small, open economies within EMU than alone, as already seen during the GFC and even more so during the pandemic.

What does the management of the post-pandemic inflation surge in the V4 countries imply for euro membership? Beyond the fact that countries need to get prepared for euro adoption in terms of convergence criteria, in our view, the conclusions are rather clear. For small, open, highly integrated economies, de facto monetary sovereignty is quite limited. By contrast, membership in a very large monetary union, encompassing the main trading partners and benefitting from the credibility and – if needed – crisis management capacity of the ECB, provides clear benefits, even in case of very large, multiple supply-side shocks to inflation.

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