DEVELOPMENT OF SELECTED CPI GROUPS IN THE V4 COUNTRIES

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Abstract

The paper aims to compare the development of selected CPI groups in the Visegrad Group countries (V4) in 2008-2024. The CPI is the most commonly used measure of changes in the price level and, thus, calculating the inflation rate. Indeed, the inflation rate is considered a key macroeconomic aggregate connected with the price stability objective, which has been the focus of developed countries for more than 20 years. However, most European countries faced a significant increase in inflation rates in recent years, mainly in 2022 and 2023. According to the OECD, the highest inflation rates in 2023 were detected in the Visegrad Group countries, namely Slovakia (10.53%), Hungary (17.12%), Poland (11.57%), and Czechia (10.66%). Therefore, this paper will identify the factors that could have contributed to the changes in the CPI value in the Visegrad Group countries. The article highlights many factors that can influence the value of the CPI to varying degrees, depending on the local focus.

Key words: Visegrad group, Consumer price index, Consumer basket

JEL Code: E31, L66

Introduction

The Consumer Price Index (CPI) is the most common and widely used indicator of inflation and is one of the most important macroeconomic aggregates. In addition, the CPI is used to monitor household purchasing power and welfare, calculate key economic indicators that are expressed in real terms, and estimate productivity, earnings, and poverty. The CPI is an index that primarily reflects consumer demand and is essential in the decision-making of economic entities, i.e., the government, firms, and the population (Białek & Roszko-Wójtowicz, 2019; Stewart & Reed, 1999; Ghodke & Giri, 2023; Chen & Hu, 2018; Fan et al., 2009).

The CPI considers changes in the retail prices of goods that households purchase for consumption. The prices of a sample of representative items included in the consumption basket, which are collected periodically, are used to estimate the CPI statistically. The CPI is mainly presented in statistics as an index number relative to a base year, which is set to 100

(Białek & Roszko-Wójtowicz, 2019; Stewart & Reed, 1999; Ghodke & Giri, 2023; Chen & Hu, 2018; Fan et al., 2009). Given that forecasts and expected inflation rates play a significant role in the economy, knowledge of the factors that can influence inflation rates can be crucial. For these reasons, this paper unpacks the factors that may have influenced the value of selected CPI groups in the V4 countries between 2007 and 2024.

1 Description of data sample

Most European countries saw inflation rising in 2022 and 2023, especially in 2022 and 2023. According to the OECD (2025), the highest inflation rates were found in 2023 in the Visegrad Group countries, namely Slovakia (10.53%), Hungary (17.12%), Poland (11.57%), and the Czech Republic (10.66%). For this reason, the paper aims to clarify what factors have influenced the inflation rates in the V4 countries, not only in recent years but over a more extended period covering the years 2007-2024. The period chosen starts in 2007, as CPI data for all V4 countries were available from 2007 onwards. The last year of the analysis is 2024, the most recent year regarding data availability. The categories with the highest weight in the consumption basket used for the CPI calculation are selected among the CPI reference groups. These categories were selected according to the consumption basket for the Czech Republic, as shown in Tab. 1. According to the ČSÚ (2025), the items with the highest weights in the consumption basket are Housing, water, energy, fuels (258.39‰), food and non-alcoholic beverages (177.43‰), and transport (105.62‰).

Tab. 1: Largest consumer basket items in the Czechia

Code	Item	Weight in ‰
E04	Housing, water, energy, fuels	258,393791
E01	Food and non-alcoholic beverages	177,431636
E07	Transport	105,619267

Source: ČSÚ (2025), own representation.

Data showing the development of CPI values for selected categories are presented as year-on-year change rates, which can be expressed as:

$$\Delta CPI = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100 \; [in \; \%] \quad (1)$$

2 Selected CPI groups in the V4 countries

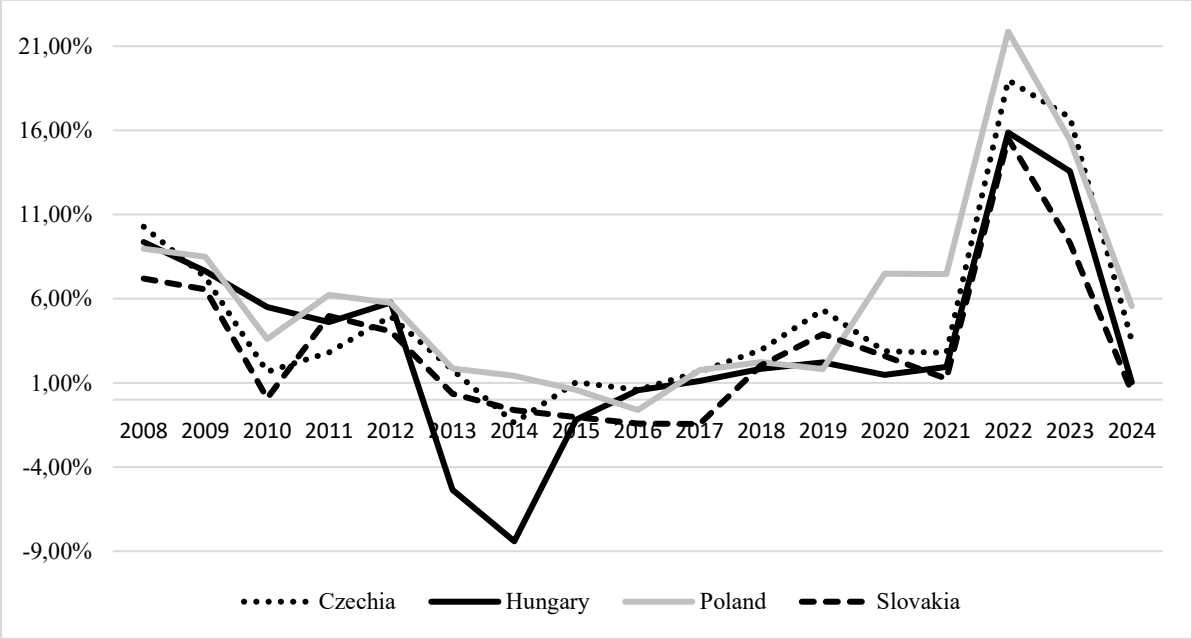
The CPI for Housing, water, electricity, gas, and other fuels for the V4 countries is recorded in Fig. 1. From 2008 onwards, a decline in the CPI began and lasted until 2010, which was most pronounced for the Czech Republic and Slovakia, while the smallest for Hungary. In the Czech Republic, the increase in the VAT rate, the granting of a record number of mortgage loans, and the fall in the prices of materials and labor due to the lack of construction contracts may have affected the value of the index in the housing sector. In all V4 countries, the housing market was also affected by different housing price developments in the period under examination, depending on the size of municipalities and the degree of wear and tear. In Hungary, the economic crisis resulted in limited growth in the credit market, and the liberalization of the electricity market from 2008 to 2010 may have impacted the CPI. In addition, an electricity price cap was introduced in Hungary in 2010. In Poland and Slovakia, the economic crisis resulted in a decline in electricity demand (Bartoš & Strejček, 2012; Tömöri & Süli-Zakar, 2011; Szőke et al., 2021). In the following two years, there was a slight increase in the CPI. Again, many factors may have been at play in varying degrees across the V4 countries, the most important of which may have been the evolution of aggregate demand, developments in the German nuclear power sector, and differences in government support for renewable energy generation (Richter & Vojtěchová, 2011).

The largest decline in the CPI was detected in the period under examination in 2013-2014, in all countries, but the biggest decline was in Hungary, by 8.41%. The main reasons for this decline in Hungary could be the government's approval of reducing household energy prices, for example, a 10% reduction in electricity and gas prices since January 2013. A larger impact on the CPI value in all V4 countries may have been the significant drop in coal prices in 2013-2014. For example, electricity prices fell by around 10% in the Czech Republic. ČEZ initiated this price decrease, which also affected the prices of alternative suppliers. In Poland, the fact that Poland is highly dependent on coal-fired power generation may have affected the CPI value (Gradzewicz et al., 2024; World Energy Council, 2014; Schindler, 2015).

From 2015 onwards, the CPI began to fluctuate slightly, reflecting an upward trend due, among other things, to rising aggregate demand. This growth peaked in 2022, even reaching 21.88% in Poland. The significant increase in the CPI in 2022 was due to energy price shocks in the V4 countries due to the Ukraine-Russia conflict. It was due to political uncertainties regarding energy supply and the rise in prices of natural gas, coal, electricity, fuel, and transport, which were unevenly reflected in the individual countries. In Poland, however, the impact was

most pronounced due to the country's geographic location, dependence on Russian energy sources, and reliance on coal-fired power generation, as Gradzewicz et al. (2024) argue. In 2023 and 2024, the CPI started to decrease significantly, which could be mainly related to the decline in the prices of energy commodities on the world markets (EIA, 2025). Another important factor that could have influenced the CPI was the development of oil prices, which is closely linked to the natural gas and fuel markets (see the description of Fig. 3 for a more detailed presentation of events affecting oil prices).

Fig. 1: Housing, water, electricity, gas and other fuels (year-on-year CPI change in %)



Source: OECD (2025), own calculations.

The second biggest item in the consumer basket is food and non-alcoholic beverages. In the food and non-alcoholic beverages section, more significant changes in the CPI in 2009 are evident, especially for the Czech Republic and Slovakia, as shown in Fig. 2. In addition, the impact of the financial crisis on household consumption was apparent in all V4 countries. In the Czech Republic, this resulted in a fall in prices of bakery products, including bread, flour, milk, and edible oils. In Slovakia, prices of fruit and vegetables, milk, cheese, eggs, mineral water, oils, and fats fell. The CPI for food and non-alcoholic beverages started to rise in 2010 and peaked in Hungary, Poland, and Slovakia in 2011, while in the Czech Republic, it peaked in 2012. In the Czech Republic, price increases for bananas, apples, sugar, and butter mainly affect the CPI value. In Hungary, there was a rise in prices of seasonal foodstuffs, flour, pork fat, and pasta products. These price developments were mainly influenced by commodity prices

on world markets and VAT increases in the Czech Republic and Hungary (ČSÚ, 2009; ŠÚ SR, 2025; Ministry for National Economy, 2014; ČNB, 2012; Smutka et al., 2012).

Subsequently, all V4 countries show a decline in the CPI for food and non-alcoholic beverages, which lasted until 2014 in Hungary, until 2016 in Slovakia, until 2015 in Poland, and in 2015 in the Czech Republic. Among the reasons for this decline was a fall in demand for vegetables due to concerns about E. Coli and Russia's ban on European vegetable exports, a decline in commodity prices on world markets, and a dampening of demand due to the fading effects of the economic recession (ČNB, 2020; Patria, 2011).

Since 2016, an increasing but slightly fluctuating CPI value for food and non-alcoholic beverages has been detected in all V4 countries. The main reasons for this development were weather effects, supply-side factors, and cyclical demand pressures. For example, in 2019, prices of vegetables (most notably potatoes), eggs, bakery products, and cereals in the Czech Republic rose. In Slovakia, prices decreased for fish, cheese, milk, oil, and fats, for example, while an increase in prices for final consumers was evident for tea and cocoa (ČSÚ, 2019; ŠÚ SR, 2020; ČNB, 2020).

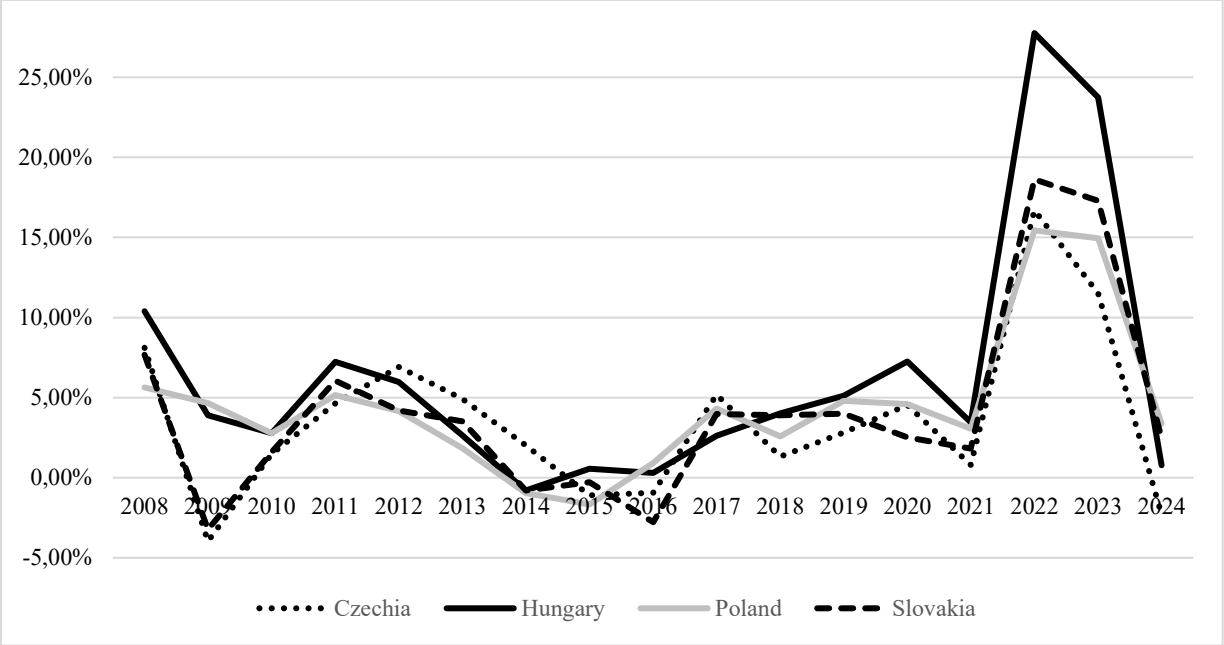
A more pronounced decline in CPI growth is visible in all V4 countries by 2021. The rise in global commodity prices was initially limited in Europe due to favorable harvests in 2019-2021. However, food prices reflected rising demand. Moreover, in the Czech Republic, the appreciating exchange rate of the koruna in 2021-2022 was reflected in lower prices of agricultural inputs (ČNB, 2023).

The decline in the CPI for food and non-alcoholic beverages in 2021 was followed by a steep rise in the CPI in 2022, with the most significant increase for Hungary. The rise in the price of vegetable oils, meat, and dairy products on international markets mainly drove this sharp increase. In the Czech Republic, potatoes rose the most, while in Poland, the price of fat products rose the most. In Hungary, the sharp increase was driven by, for example, the rise in the price of eggs, dairy products, bread, cheese, butter, and margarine. Hungary reacted to the significant price increases by introducing a price ceiling on staple foods such as sugar, eggs, and potatoes until 2023 (ČSÚ 2021; KSH, 2025). Other influences included disruptions in supply chains, extreme price increases in artificial fertilizers, the depreciation of the HUF and PLN in Hungary and Poland, and market interconnectedness in crop production (ČNB, 2023).

A more pronounced slowdown in CPI growth for food and non-alcoholic beverages occurred in the following years, 2023 and 2024. In the V4 markets, several factors were cumulatively at work simultaneously. These included rising input prices (wages, energy), cost pressures across the production chain, commodity price developments on world markets,

extreme weather and production problems, rising livestock costs, logistics costs, the impact of changes in tax rates, and the way firms set prices in times of uncertainty (ČNB, 2025).

Fig. 2: Food and non-alcoholic beverages (year-on-year CPI change in %)



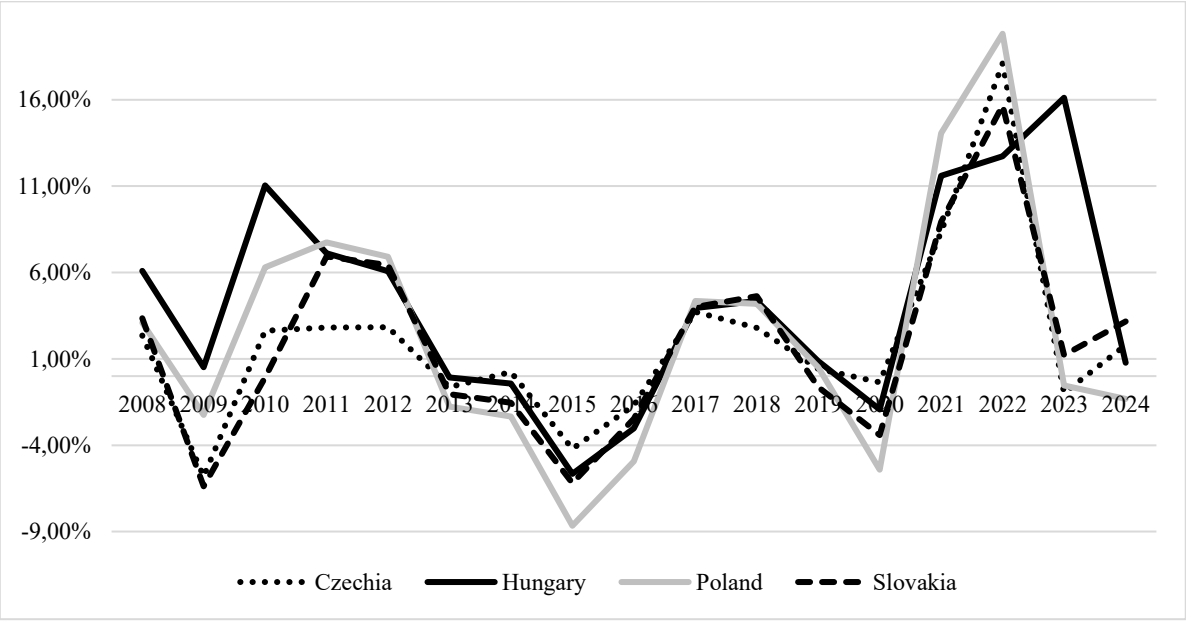
Source: OECD (2025), own calculations.

The third biggest item in the consumer basket presents transport. Description of development CPI for transport Fig. 3 shows. The most significant influence on CPI transport could be the development of oil prices in world markets, which practically determine the trend of CPI transport development in the V4 countries. However, empirical testing would be necessary to verify this claim, which is not the scope of this paper. In the case of transport, the CPI in 2008 and 2009 could have been affected by the calming of the political situation in the world, the decline in the performance of developed economies in particular, and the seasonal decline in demand for oil and oil products (MPO, 2011). From 2010 onwards, price growth in transport was detected; this could have been caused by the continuous increase in average prices of oil and petroleum products (and other mineral fuels), which affected fuel prices (MPO, 2011). From 2011 until 2016, a slowdown in the growth rate of the CPI for transport was characteristic in all V4 countries. The consequence may have been a decline in world oil prices. This decline was mainly due to oversupply due to slowing investment in the US, strengthening of the USD, deterioration in global growth prospects, change in OPEC's policy stance, and rapid increase in the efficiency of shale oil production in the US. Despite accounting for less than 6%

of global oil production, WTI production accounted for roughly half of global oil production growth between 2010 and 2014. This fact overshadowed the problems of supply disruptions in the Middle East, the conflict in Libya, and concerns about supply shortages in Iraq. Beyond that, there has also been weakening demand, particularly in 2015-2016 (Stocker et al., 2018). The subsequent rise in the CPI transport could result from rising oil prices in global markets due to strong demand and OPEC's agreement to cut oil production (EIA, 2017).

Between 2018 and 2020, CPI values could be affected by a decline in oil prices in world markets due to, for example, an increase in US oil production that limited the impact of OPEC's oil production cut announcements and US sanctions on Iran and Venezuela (EIA, 2020). With 2021, a rise in the transport CPI is evident, which could be mainly attributed to the rise in oil prices in world markets. Reasons for the rise in oil prices included low global oil inventories, geopolitical tensions (Ukraine-Russia, Israel-Hamas), a significant increase in the cost of insurance for Red Sea transit, central banks raising interest rates, and the strengthening of the USD in European markets (EIA, 2023; EIA, 2024). At the same time, a decline in oil prices and the CPI was evident in 2024. It could be due to weakening global economic growth, reduced demand for fuel, growth in non-OPEC+ countries' oil production, i.e., Guyana and Canada, finding alternative routes to transport oil outside the Red Sea due to geopolitical tensions (EIA, 2025).

Fig. 3: Transport (year-on-year CPI change in %)



Source: OECD (2025), own calculations.

Conclusion

The paper aimed to compare the development of selected CPI groups in the V4 countries in 2008-2024. Housing, water, electricity, gas, and other fuels are a broad area that can be affected by many factors in different intensities in different countries. As it was detected, the biggest impact on the CPI for Housing, water, electricity, gas and other fuels could be due to changes in the VAT rate, the situation on the credit market, factor prices, the evolution of housing prices, the manifestation of crises and geopolitical situation, the evolution of aggregate demand, price regulation, political uncertainties and the evolution of energy commodity prices on world markets.

Many factors had an impact on the CPI for food in the period under examination, including commodity prices on world markets, changes in indirect taxes, demand in the V4 markets, the geopolitical situation, the agricultural commodity harvest, the exchange rate, price regulation (Hungary), and energy prices.

In the case of transport, it appears that the biggest influence on the CPI in the period under examination may have been the development of investment, the phase of the business cycle, the geopolitical situation and the development of oil prices on world markets (influenced mainly by market demand and the attitude of OPEC). In addition, the specifics of individual markets in the V4 countries were reflected, for example, in the area of public transport fares and the development of prices of transport equipment, including accessories.

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