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# REACTION OF THE VISEGRAD GROUP COUNTRIES LABOR MARKETS TO THE ECONOMIC SHOCKS

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**Purpose:** The economies of European countries have faced two significant shocks: the Covid-19 pandemic and the war in Ukraine. This article aims to compare the response of labor markets in the Visegrad Group countries (V4) to these shocks.
**Design/methodology/approach**: Article examining changes in employment, unemployment, and economic activity, the role of flexible forms of employment as "business cycle buffers" from 2019 to 2024. Given the short analysis period covering consecutive economic shocks disrupting long-term trends, the adopted research method involved time series analysis of labor market changes.
**Findings:** The findings suggest a relatively weak reaction of the labor markets in V4 countries, especially to the second shock. Share of flexible employment forms significantly changed only in response to the first shock.
**Research limitations/implications**: The research findings is limited because of the specificity of the analysed countries, which were characterized by low unemployment levels. Future research will aim to identify the reasons behind the V4 economies' success in maintaining high economic activity of the population despite economic crises.
**Practical implications:** Shares of flexible forms of employment decreased during the pandemic shock in all V4 countries (except self-employment), indicating that they served as "business cycle buffers". In Poland has observed a gradual reduction in the use of flexible forms of employment. This trend indicates that it is becoming increasingly difficult for employers to find people willing to work in flexible forms.
**Social implications:** The decrease in the share of flexible forms of employment will limit the negative phenomena associated with them, which will improve the situation of people deriving income from work. Employers will be forced to take actions for employees in line with social responsibility, in order to stabilize employment.
**Originality/value:** The effects of the covid-19 pandemic are widely described in the literature, but there is no comparison to the effects of the war in Ukraine. The article is addressed to labor market researchers and company managers, especially those responsible for the HR department.
**Keywords:** labor market, Visegrad Group countries, economic shocks, flexible forms of employment.
**Category of the paper:** Research paper.

## 1. Introduction

Two "black swans" emerged in the global economy within two years: the Covid-19 pandemic and the war in Ukraine. The first event led to the largest decline in macroeconomic indicators since the Great Recession, including the highest rise in unemployment rate (Coibion et al., 2020; Privara, 2020).

In February 2022, another "black swan" appeared in the form of Russia's armed invasion of Ukraine. Western countries responded with severe sanctions against Russia, particularly targeting energy resources. This occurred at a time when Europe relied on affordable Russian energy supplies, with Russia being a leading global producer and exporter. Russia retaliated by drastically reducing gas exports to the EU markets (which were not initially embargoed) and the attack on the Nord Stream I and II pipelines halted gas supplies to Germany, the largest recipient (Kuzemko et al., 2022).

The occurrence of two supply shocks within a two-year interval entails numerous risks to the global economy, both short-term (stagflation, high interest rates, exchange rate volatility and increased energy prices) and long-term (hyperinflation, recession and challenges in meeting climate goals) (Desalegn et al., 2022). These threats vary in intensity across different national economies.

This article aims to compare the impact of two subsequent economic shocks on the labor markets of selected countries and assess the role of flexible employment forms as " business cycle buffers". This study fills a gap in the literature by evaluating the effects of the war in Ukraine on neighboring economies and comparing them with the pandemic shock's impacts.

The situation of the V4 countries is unique as three of them border Ukraine, which is at war, and each has received significant groups of war refugees. Consequently, in the literature section, the article provides a brief overview of the V4 countries' labor market reactions to economic shocks and their characteristics. The rest of the article outlines the research assumptions, data analysis methods, and presents changes in employment, unemployment, and economic activity based on Eurostat's quarterly data. The analysis also examines changes in the employment structure, considering flexible employment forms.

The article concludes with a discussion and final conclusions.

## 2. Labor market reaction to economic shocks

Economic shocks, understood as unexpected economic downturns, manifest themselves in recession or a significant weakening of the pace of economic growth. They cause an adaptive response from employers, in the form of a decrease in demand for labour, resulting in a decrease

in the size of employment, shortened working hours and a decrease in wages, accompanying a decrease in labour productivity (Kwiatkowski, 2011). A decrease in employment affects changes in the level of unemployment and professional activity (Andolfatto, 1996; Elsby et al., 2010).

The Covid-19 pandemic, threatening lives and health, prompted governments to introduce social, economic, and political restrictions. Lockdowns caused a severe global economic downturn, significant employment declines (Coibion et al., 2020; Evgenidis, Fasianos, 2023), supply chain disruptions, and reduced working hours, reduction in wages, disposable income and tax revenues, resulting in a demand shock (Privara, 2020; IMF, 2022; Kwiatkowski, 2022; Hupkau, 2023**)**. The pandemic led to the loss of 255 million full-time jobs, four times more than during the 2009 global financial crisis (Bieszk-Stolorz, Markowicz, 2022).

The pandemic's effects varied across economies due to differences in economic structures, sectoral and demographic susceptibility, and measures to limit its spread, including remote work (Mączyńska, 2021; Radziukiewicz, 2021; Arntz et al., 2022; Muster, 2022; Pizzinelli, Shibata, 2023; Burdett et al., 2024). The recreational industry, tourism, and sectors unable to support remote work (e.g., transport, trade, production and agriculture) suffered the most due to the lockdowns (Cortes, Forsythe, 2020). Conversely, demand for employees increased in areas such as e-commerce, courier services and parcel lockers, cybersecurity, financial analysis, and medical professions (Rosak-Szyrocka et al., 2021; Kwiatkowski, Szymańska, 2022).

Governments worldwide responded to the economic crisis by stimulating the economy through recovery-friendly spending (Corfee-Morlot et al., 2021; Afonso, 2023; Evgenidis, Fasianos, 2023). Employment and unemployment in some economies showed resilience to GDP declines, with many workers retained under job retention programs (Kukołowicz, 2021; Meriküll, Paulus, 2023). Thanks to the vaccination program, economic conditions improved in 2021, with most economies reporting positive growth rates (Basdekis et al., 2022).

During the pandemic, professions capable of remote work experienced lower employment declines (Cortes, Forsythe, 2020). Working from home appealed to employees due to benefits like flexible schedules, reduced commuting and better work-life balance (Arntz et al., 2022). Some studies indicate increased productivity from remote work (Barrero et al., 2021; Deole et al., 2023), while others suggest reduced productivity depending on the employee group (Kitagawa et al., 2021). Employers are skeptical about remote work's efficacy for teamwork, coordination, and cooperation-dependent businesses and for new employees learning organizational culture and practices (Lee, 2023).

The reconstruction of economic activity after the pandemic was disrupted by the war in Ukraine. It caused another negative supply shock in the global economy, disrupting energy and food supply chains, and causing perturbations on financial markets. Sanctions led to increased energy prices, causing an energy crisis in the EU due to high dependence on Russian supplies of raw energy materials. Rising energy prices spread throughout the economy and broken supply chains continued to drive up commodity prices and triggered inflation at unprecedented

levels since World War II. This exacerbated the existing economic issues resulting from the war, i.e. limited international trade and weakened economic growth amidst post-pandemic high public debts (Prohorovs, 2022).

European governments' reactions to the situation covered several areas of action. High energy prices have become a social problem, and therefore national governments have mobilized significant funds for subsidies to balance the increase in the costs of energy supply for households. Efforts to diversify energy sources included increased liquid natural gas purchases, demand reduction measures, and enforcing energy conservation. EU countries also boosted spending on alternative clean energy sources to gradually replace fossil fuels (Goldthau, Youngs, 2023).

During the war-induced supply shock, employment suffered most in countries dependent on Russian imports, primarily in energy-intensive sectors such as manufacturing and transport. The energy crisis then affected other sectors, and high inflation negatively impacted consumer spending, generating another demand shock (Prohorovs, Bistrova, 2022).

In periods of economic shocks, employees in flexible forms of employment are more vulnerable to layoffs due to the ease of terminating non-standard contracts during downturns (Kalleberg et al., 2003; Gaston, Kishi, 2007; Mikołajczak, 2021; Mura et al., 2020). The extent of non-standard employment use (temporary employment, part-time and self-employed) varies by country, influenced by legal regulations **(**Eamets, Jaakson, 2014; Taracha, Mirowski, 2022). From an employee's perspective, flexible employment may be a result of their own choice for additional income or due to non-professional obligations (e.g. caring for children or elderly). However, more often, the acceptance of flexible employment results from limited availability of standard job offers (Blundell et al., 2014).

Referring to flexible forms of employment, the 2008 financial crisis revealed a statistically significant, positive correlation between the PRB decline and temporary/part-time work in Czechia and Slovakia, a negative correlation with self-employment in Hungary and Poland, and a negative correlation with part-time work (Zieliński, 2019). The increase in unemployment accompanying the higher level of self-employment in the V4 countries indicated establishment of own businesses and substantiated performing existing tasks under pressure from employers during periods of economic deterioration (Dvouletý, 2017). Poland was the most flexible labor market in terms of the correlation between the unemployment rate and all analyzed forms of non-standard employment (Zieliński, 2020). This situation does not occur in most OECD countries, where a gradual decline in self-employment rates can be observed, also in periods of economic downturn (Cieślik, van Stel, 2024; Denderski, Sniekers, 2024).

The article focuses on the Visegrad Group countries (V4), which, due to historical reasons, similar development conditions, experiences, geographical proximity and institutional similarity, present comparable economic development levels and employment structures. All V4 countries joined the EU simultaneously in May 2004. Despite cooperation,

the V4 countries' political and economic priorities differ, resulting in uncoordinated positions within the EU (Dangerfield, 2008).

Despite relatively rapid economic growth in the 1990s and early 21st century, initiated by the transition from a socialist to a market economy, the V4 countries were characterized by a low level of GDP per capita, especially compared to the EU15 countries (Schmidt, 2016). Accession to the EU accelerated V4 economies' growth through access to the Single Market, EU structural funds, and foreign investments driven by relatively low labor costs (Antohi et al., 2019; Schwabe, 2021). The process of convergence of the V4 economies with the EU is noticeable (Kokocinska, Puziak, 2018), which results in, among others, a decreasing unemployment rate (partly as a result of emigration to more developed EU member states), increasing professional activity and rising employment rates, which were initially lower than in Western Europe, especially in Hungary and Poland (Sulich, 2016; Kónya, 2018).

While the Covid-19 pandemic posed similar challenges to the V4 countries as other economies, the war in Ukraine is associated with additional challenges. The V4 countries, except Czechia, border Ukraine and received notable war refugee groups, impacting foreign investor confidence. Additionally, the war initiated an energy crisis, exacerbating existing challenges. Compared to the EU, the V4 countries have higher energy consumption, lower energy efficiency, and limited research and development investments (Bajan et al., 2021). However, convergence is occurring, with V4 economies diversifying energy sources and improving energy efficiency, translating increased energy consumption into faster GDP growth compared to the EU14. Poland is in the most difficult situation, remaining the most reliant on coal for electricity production (Kochanek, 2021).

From the article’s perspective, the inflow of Ukrainian immigrants is crucial as they supplement labor markets in host countries, creating additional jobs to provide the refugees with necessary services, and boosting demand through income and benefits (Prohorovs, Bistrova, 2022).

A review of issues related to the impact of the pandemic and the war in Ukraine on the labor market and the characteristics of the labor markets of the V4 countries allowed us to pose four research questions addressed in the article:

- Do "black swan" economic shocks prompt fast labor market reactions (within one quarter)?
- Which crisis (pandemic or Ukraine war) had a more significant impact on V4 labor markets?
- Did the crises have a negative impact on the economic activity of people in the V4 countries compared to the EU average?
- Do flexible forms of employment act as "business cycle buffers" in V4 labor markets?

is achieving full and productive employment and decent (compatible with preparation) work?

## 3. Method

To answer the research questions, quarterly Eurostat data from 2019-2024 for individuals aged 20-64 was used. The analysis began with a comparison of employment and unemployment figures. Comparing quarter-to-quarter changes, considering seasonal fluctuations (comparing the same quarters in subsequent years), answered the first two questions. Considerations in this area were supplemented with an analysis of changes in the economic activity of the population in the analyzed countries against the background of average values for the EU27, which made it possible to answer the third question.

Due to the relatively short period of analysis covering two successive economic shocks causing interruption (weakening) of long-term trends, the research method adopted in the article is the analysis of time series of changes in the labor market. This approach assessed the impact of the pandemic and the war in Ukraine on the scale of growing imbalances in the labor markets of the V4 countries.

To address the fourth question, the share of flexible employment forms in total employment was summarized, including temporary, part-time, and self-employment. Figures illustrate change rates, with detailed data included in appendices (Appendix (Table 3-5)).

## 4. Results

Table 1 shows the numbers of employed and unemployed people in the V4 countries on a quarterly basis in the period covering the year before the Covid-19 pandemic shock and the latest available data. The age group analyzed includes people from 20 to 64 years old due to their dominance among the professionally active.

**Table 1.**
*Changes in the number of employed and unemployed people (thousands) in the V4 countries in 2019-2023 (age from 20 to 64 years)*

| Quarter/ Year | Czechia | | Hungary | | Poland | | Slovakia | |
|---|---|---|---|---|---|---|---|---|
| | Employ. | Unempl. | Employ. | Unempl. | Employ. | Unempl. | Employ. | Unempl. |
| 1/2019 | 5129.1 | 105.9 | 4396.1 | 153.7 | 16243.9 | 649.4 | 2539.0 | 153.8 |
| 2/2019 | 5120.7 | 97.4 | 4388.1 | 147.3 | 16475.7 | 526.6 | 2522.3 | 149.2 |
| 3/2019 | 5125.7 | 107.8 | 4387.9 | 152.2 | 16596.2 | 520.4 | 2535.4 | 152.0 |
| 4/2019 | 5128.5 | 103.5 | 4390.4 | 142.6 | 16540.6 | 477.9 | 2542.0 | 146.3 |
| 1/2020 | 5104.4 | 102.3 | 4342.2 | 161.9 | 16479.4 | 517.6 | 2501.7 | 155.3 |
| 2/2020 | 5047.1 | 122.9 | 4269.8 | 204.4 | 16306.3 | 535.7 | 2458.3 | 172.4 |
| 3/2020 | 5065.5 | 145.3 | 4341.7 | 196.6 | 16552.8 | 556.0 | 2480.5 | 187.8 |
| 4/2020 | 5048.6 | 154.2 | 4342.1 | 186.6 | 16590.7 | 524.2 | 2491.1 | 183.3 |
| 1/2021 | 5006.3 | 171.8 | 4425.4 | 199.9 | 16481.6 | 688.3 | 2460.2 | 184.1 |
| 2/2021 | 5008.9 | 153.3 | 4482.1 | 182.4 | 16627.1 | 606.8 | 2495.6 | 184.8 |
| 3/2021 | 5080.3 | 136.6 | 4512.2 | 173.6 | 16800.2 | 526.3 | 2545.0 | 181.9 |

Cont. table 1.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4/2021 | 5089.2 | 110.8 | 4533.2 | 167.6 | 16780.6 | 497.2 | 2564.3 | 175.8 |
| 1/2022 | 4971.1 | 111.9 | 4522.0 | 169.5 | 16724.5 | 533.3 | 2526.4 | 166.9 |
| 2/2022 | 4984.7 | 110.3 | 4538.0 | 143.9 | 16763.2 | 449.4 | 2557.4 | 161.8 |
| 3/2022 | 5014.7 | 108.3 | 4543.5 | 164.6 | 16664.8 | 485.3 | 2563.5 | 158.7 |
| 4/2022 | 5015.4 | 108.8 | 4538.6 | 177.2 | 16785.8 | 483.9 | 2569.6 | 160.9 |
| 1/2023 | 4830.5 | 125.4 | 4526.8 | 187.1 | 16793.8 | 490.1 | 2529.6 | 163.9 |
| 2/2023 | 4875.0 | 120.4 | 4555.7 | 178.0 | 16761.2 | 434.7 | 2553.5 | 152.4 |
| 3/2023 | 4872.7 | 125.6 | 4559.8 | 184.2 | 16756.1 | 453.4 | 2549.7 | 152.7 |
| 4/2023 | 4881.2 | 125.9 | 4561.0 | 199.4 | 16793.9 | 519.8 | 2579.8 | 149.2 |
| 1/2024 | 4994.8 | 140.8 | 4537.9 | 209.7 | 16681.6 | 534.8 | 2538.0 | 145.9 |
| 2/2024 | 4959.3 | 122.4 | 4555.0 | 200.2 | 16655.9 | 443.5 | 2554.6 | 134.6 |
| 3/2024 | 4974.2 | 119.5 | 4559.1 | 204.4 | 16698.7 | 486.1 | 2546.6 | 137.9 |
| 4/2024 | 4995.3 | 123.0 | 4544.2 | 196.5 | 16680.5 | 471.2 | 2576.8 | 135.6 |

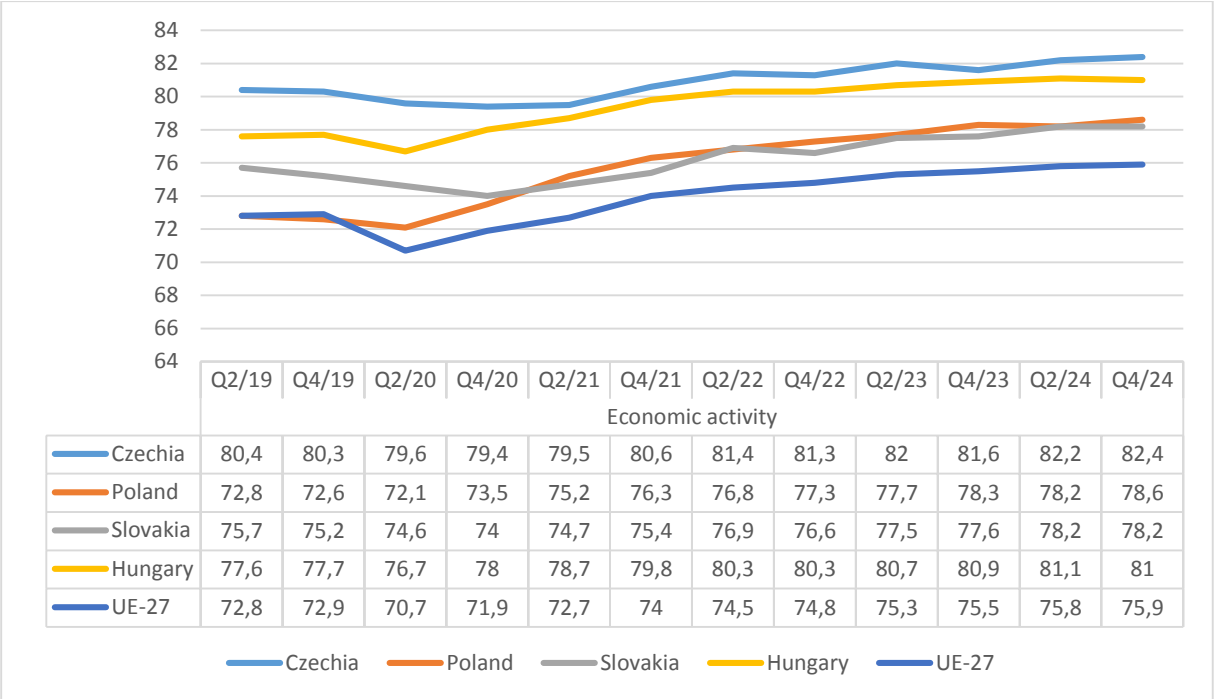
Source: Eurostat database: Labour market, Employment and activity, Unemployment (age from 20 to 64 years).

The crisis related to the Covid-19 pandemic caused substantial changes in employment in the V4 countries. To illustrate the scale of these changes, data for the quarter in which the shock occurred was compared to the same quarter in the following year. All V4 economies experienced a decline in employment in Q2 2020, both compared to Q1 2020 and Q2 2019. This decline in employment, taking into account seasonal fluctuations (comparison of the same quarters in subsequent years), persisted in three out of four countries for over a year, with Poland showing the fastest recovery in employment by Q1 2021.

In contrast, a decline in employment due to the war in Ukraine was observed only in Czechia. The other V4 countries saw an increase in employment in Q2 2022 compared to Q2 2021. The employment decline in Czechia in 2022 may be attributed to both the war in Ukraine and an ongoing, several-year downward trend in the number of employees. In Poland, the rapid post-pandemic recovery occurred within an upward trend in the number of employees. Over the entire period from Q1 2019 to Q4 2024, employment decreased by 2.4% in Czechia, while it increased by 1.5% in Slovakia, by 2.7% in Poland and by 3.4% in Hungary.

An analysis of the number of unemployed revealed an increase in all V4 countries during the pandemic period. However, in the first year of the Ukraine war, the number of unemployed rose only in Czechia and Hungary. This indicates that the pandemic had a greater impact on the V4 labor markets than the Ukraine war.

Differences in the responses of employed and unemployed to economic shocks in the analyzed countries suggest changes in economic activity of the populations. Figure 1 presents the changes in the level of economic activity in the V4 countries.




| | Q2/19 | Q4/19 | Q2/20 | Q4/20 | Q2/21 | Q4/21 | Q2/22 | Q4/22 | Q2/23 | Q4/23 | Q2/24 | Q4/24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Economic activity | | | | | | | | | | | |
| Czechia | 80,4 | 80,3 | 79,6 | 79,4 | 79,5 | 80,6 | 81,4 | 81,3 | 82 | 81,6 | 82,2 | 82,4 |
| Poland | 72,8 | 72,6 | 72,1 | 73,5 | 75,2 | 76,3 | 76,8 | 77,3 | 77,7 | 78,3 | 78,2 | 78,6 |
| Slovakia | 75,7 | 75,2 | 74,6 | 74 | 74,7 | 75,4 | 76,9 | 76,6 | 77,5 | 77,6 | 78,2 | 78,2 |
| Hungary | 77,6 | 77,7 | 76,7 | 78 | 78,7 | 79,8 | 80,3 | 80,3 | 80,7 | 80,9 | 81,1 | 81 |
| UE-27 | 72,8 | 72,9 | 70,7 | 71,9 | 72,7 | 74 | 74,5 | 74,8 | 75,3 | 75,5 | 75,8 | 75,9 |

**Figure 1.** Changes in economic activity of the population in the V4 countries in 2019-2024 (age from 20 to 64 years).

Due to moderate changes in economic activity and the readability of the graph, data for the second and fourth quarters of each year included in the analysis period were used. Despite experiencing two economic shocks, the period from 2019 to 2024 saw an increase in economic activity of the population across all V4 countries and in EU-27. The highest increase in the period of Q2 2019 to 4Q 2024 was recorded in Poland (5.8 p.p.), which allowed this country to overtake Slovakia in terms of the level of economic activity. Notably, economic activity of the population in all V4 countries exceeded the EU27 average in Q2 2020 and has remained at a higher level since then.

In addition to determining the response of employment and unemployment levels to economic shocks, the article also explores whether flexible forms of employment in the V4 countries acted as "business cycle buffers". Figures 2-5 depict changes in the share of flexible employment forms from the first quarter of 2019 to the last quarter of 2024 in the V4 countries. Detailed data on the number of employees in each flexible employment form and their share in total employment are provided in the appendices (Appendix (Table 3-5)).

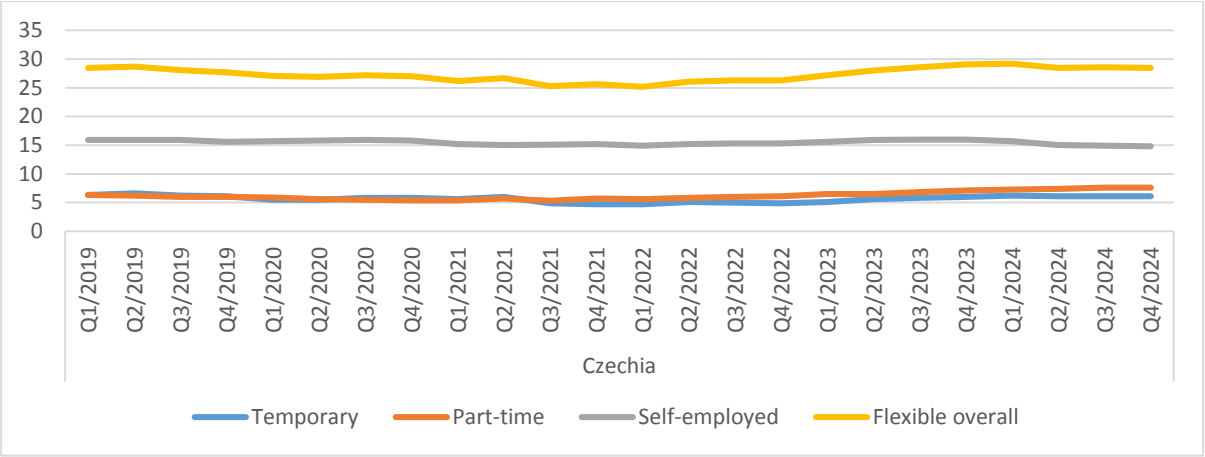



**Figure 2.** Share of flexible forms of employment in total employment in Czechia in the period 1Q2019-4Q2023.

Source: data from Appendix (Table 3-5).

In Czechia, labor market saw a decline in the share of flexible forms of employment during the period of economic shocks, with a return to the initial state after the shocks had subsided. In the first quarter of 2020, when the pandemic began, there was a noticeable decline in the share of fixed-term workers (by 0.6 p.p.), a slight decline in the share of part-time workers (by 0.1 p.p.) and a slight increase in the share of the self-employed (by 0.1 p.p.). The reaction to the outbreak of the war in Ukraine was much weaker (a decline in the share of fixed-term and part-time workers by 0.1 p.p. and a maintenance of the share of the self-employed). Over the entire period under analysis, there was an increase in the share of part-time workers and a decrease in the share of the other two forms of flexible employment.

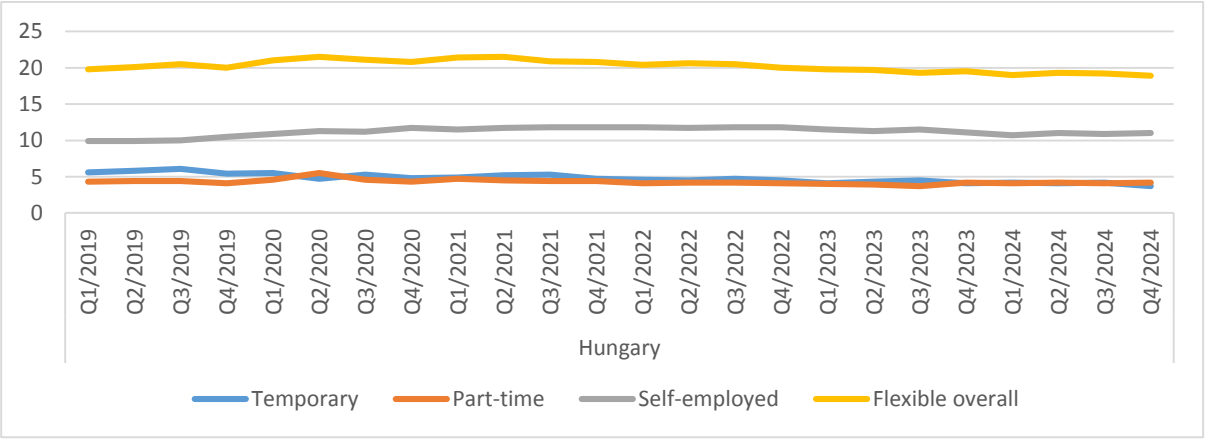



**Figure 3.** Share of flexible forms of employment in total employment in Hungary in the period 1Q2019-4Q2023.

Source: data from Appendix (Table 3-5).

In the Hungarian economy, periods of economic shocks caused an increase in the share of flexible forms of employment in total. In the quarter of the outbreak of the pandemic, the share of part-time workers fell (by 0.3 p.p.), the share of fixed-term workers (by 0.1 p.p.) and the self-employed (by 0.4 p.p.) increased. The reaction to the outbreak of the war in Ukraine was a decrease in the share of fixed-term workers (by 0.1 p.p.), part-time workers (by 0.3 p.p.) and

the share of self-employed remained the same. For the entire period under analysis, the share of fixed-term workers fell (by 1.9 p.p.), part-time workers (by 0.1 p.p.) and the share of self-employed increased (by 1.1 p.p.).

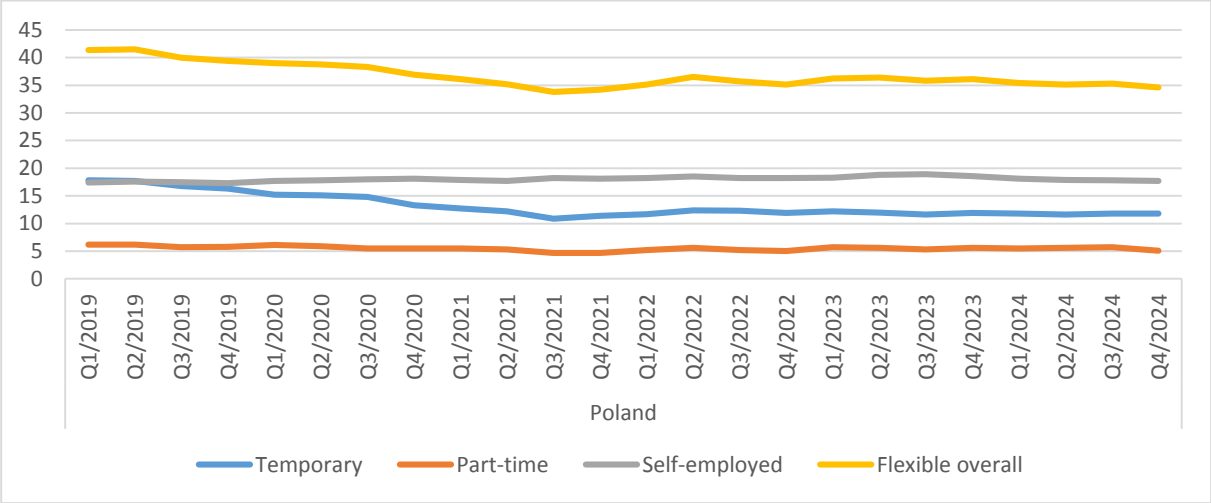



**Figure 4.** Share of flexible forms of employment in total employment in Poland in the period 1Q2019-4Q2023.

Source: data from Appendix (Table 3-5).

In Poland, there was a decrease in the share of flexible forms of employment in total employment, a trend that had been observed before the Covid-19 crisis. In the quarter in which the pandemic began, there was a significant decrease in the share of fixed-term workers (by 1.1 p.p.) and an increase in the share of other forms (part-time workers by 0.3 p.p. and self-employed by 0.4%). The reaction to the outbreak of war in Ukraine was an increase in the share of fixed-term workers (by 0.3 p.p.), part-time workers by 0.5 p.p. and self-employed (by 0.1 p.p.). Throughout the period under review, the share of fixed-term workers dropped significantly (by 6 p.p.), part-time workers by (1.1 p.p.), while the share of self-employed increased (by 0.3 p.p.).

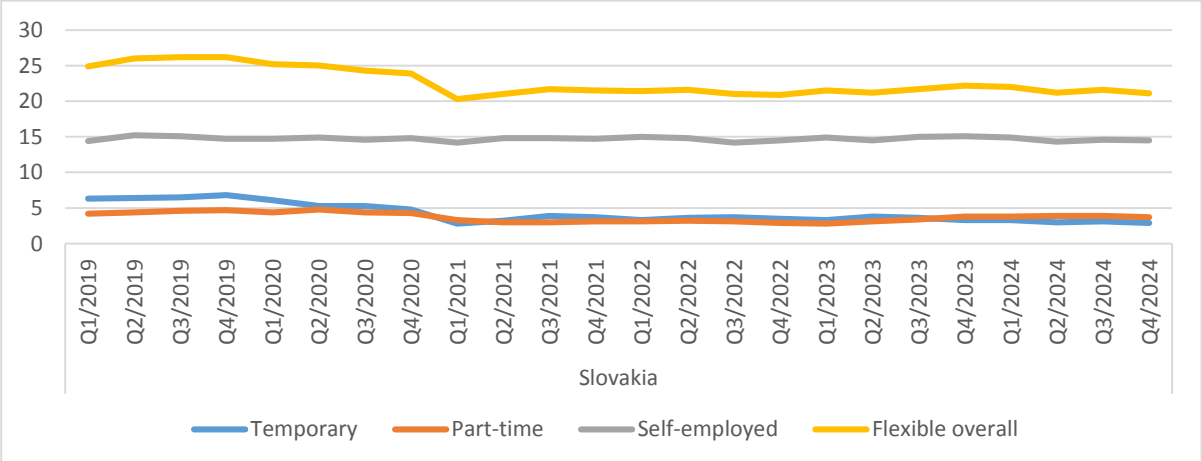



**Figure 5.** Share of flexible forms of employment in total employment in Slovakia in the period 1Q2019-4Q2023.

Source: data from Appendix (Table 3-5).

In Slovakia, the share of flexible forms of employment fell during periods of economic shocks, and then increased. In the quarter of the outbreak of the pandemic, there was a decrease in the share of fixed-term workers (by 0.7 p.p.), a decrease in the share of part-time workers (by 0.3 p.p.) and a maintenance of the share of self-employed. The reaction to the outbreak of war in Ukraine was an increase in the share of fixed-term workers and self-employed (by 0.3 p.p.) and a maintenance of the share of part-time workers. For the entire period under analysis, the share of fixed-term workers fell significantly (by 3.4 p.p.), part-time workers by (0.5 p.p.) and the share of self-employed increased (by 1.1 p.p.).

Differences in the response to the share of flexible forms of employment in the analyzed countries require taking into account the three basic forms that constitute them.

The share of part-time workers in total employment was stable. The minor changes in the case of this form of employment are due, among other things, to its lowest popularity in all (except Hungary) V4 countries. The share of part-time workers fell slightly during the Covid-related shock on the Czechia and Polish labor markets, i.e. in the economies with the lowest unemployment rates. In the case of the Czechia, the increase in the share of part-time workers occurred in recent quarters, which indicates that employers are reaching for this form of employment in conditions of labor supply shortages on the market.

Diversification of changes can be observed in the case of fixed-term contracts, which is largely due to the initial states. Apart from Poland, in the three remaining economies the share of this form of flexible employment was only slightly higher than part-time work (and even lower in the case of Hungary), which results in small differences in shares throughout the analysed period. In all V4 economies, fixed-term employment recorded a decline in its share in employment in response to covid-19 (the weakest in the Hungarian economy). The strongest decline in the share of fixed-term contracts occurred in Poland, although it is still significantly higher than in other V4 countries. The downward trend in the share of this form in total employment occurred in Poland before the pandemic (a decline of 2.5 percentage points in Q1 2019-Q1 2020), with this process accelerating in the pandemic year (a decline of 2.9 percentage points in Q1 2020-Q1 2021).

In the case of self-employment, while in response to the pandemic crisis there was an increase in its share in total employment in all V4 countries (in the Czechia and Slovakia for three quarters, in Poland and the Hungarian economy for at least one year), in response to the war in Ukraine an increase in the share of self-employment for over a year was observed only in the Czechia, in Poland it lasted only one quarter, in the Hungarian economy two quarters, and in Slovakia the share of self-employment in total employment fell in 2022 (Table 2). This confirms the previously observed smaller impact of the second economic shock on the labor markets of the V4 countries and their varied reactions.

**Table 2.**
*Direction of changes in employment, unemployment and the share of flexible forms of employment in the V4 countries in 2020 and 2022 years*

| Country | Quarter/ Year | Employment | Unemploy-ment | Temporary | Part-time | Self-employed |
|---|---|---|---|---|---|---|
| Czechia | 1/2020 | ↘ | ↘ | ↘ | ↘ | ↗ |
| | 2/2020 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 3/2020 | ↗ | ↗ | ↗ | ↘ | ↗ |
| | 4/2020 | ↘ | ↗ | ↗ | ↘ | ↘ |
| | 1/2022 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 2/2022 | ↗ | ↘ | ↗ | ↗ | ↗ |
| | 3/2022 | ↗ | ↘ | ↘ | ↗ | ↗ |
| | 4/2022 | ↗ | ↗ | ↘ | ↗ | ↗ |
| Hungary | 1/2020 | ↘ | ↗ | ↗ | ↗ | ↗ |
| | 2/2020 | ↘ | ↗ | ↘ | ↗ | ↗ |
| | 3/2020 | ↗ | ↘ | ↗ | ↘ | ↗ |
| | 4/2020 | ↗ | ↘ | ↘ | ↘ | ↗ |
| | 1/2022 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 2/2022 | ↗ | ↘ | ↘ | ↗ | ↘ |
| | 3/2022 | ↗ | ↗ | ↗ | ↗ | ↗ |
| | 4/2022 | ↘ | ↗ | ↘ | ↘ | ↘ |
| Poland | 1/2020 | ↘ | ↗ | ↘ | ↗ | ↗ |
| | 2/2020 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 3/2020 | ↗ | ↗ | ↘ | ↘ | ↗ |
| | 4/2020 | ↗ | ↘ | ↘ | ↘ | ↗ |
| | 1/2022 | ↘ | ↗ | ↗ | ↗ | ↗ |
| | 2/2022 | ↗ | ↘ | ↗ | ↗ | ↗ |
| | 3/2022 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 4/2022 | ↗ | ↘ | ↘ | ↘ | ↗ |
| Slovakia | 1/2020 | ↘ | ↗ | ↘ | ↘ | ↘ |
| | 2/2020 | ↘ | ↗ | ↘ | ↗ | ↘ |
| | 3/2020 | ↗ | ↗ | ↗ | ↘ | ↘ |
| | 4/2020 | ↗ | ↘ | ↘ | ↘ | ↗ |
| | 1/2022 | ↘ | ↘ | ↘ | ↗ | ↗ |
| | 2/2022 | ↗ | ↘ | ↗ | ↗ | ↘ |
| | 3/2022 | ↗ | ↘ | ↗ | ↘ | ↘ |
| | 4/2022 | ↗ | ↗ | ↘ | ↘ | ↗ |

Source: data from Table 1 and Appendix (Table 3-5).

## 5. Discussion and conclusions

The economic shock associated with the pandemic caused a reaction of the labor markets of the V4 countries in a very short period, i.e. already in the first quarter. No such reaction was observed in the case of the second shock, which indicates that the labor markets of the V4 countries were more seriously affected by the pandemic shock. Economic shocks did not negatively affect the economic activity of the population in the V4 countries. All analyzed economies recorded an increase in economic activity, exceeding the average economic activity for the EU 27.

Crises either slowed down or reinforced existing employment trends. This is particularly evident in Poland, where employment growth observed in 2019 was only temporarily hindered during the Covid-19 pandemic, and in Czechia, where employment decline had already begun in 2019. The decline in employment occurred in the country with the highest level of professional activity at the beginning of the period under review, the decline in the share of flexible forms of employment occurred in Poland, where they are most frequently used.

While the shares of flexible forms of employment decreased (except self-employment) during the pandemic shock in all V4 countries, indicating that they served as "business cycle buffers", in the year of the outbreak of the war in Ukraine, their share in employment decreased slightly in Hungary and Slovakia, whereas in Poland and Czechia, an increase was noted. This may be due to the lower impact of the second economic shock on the labor markets of the V4 countries, but it may also indicate a gradual reduction in the use of flexible forms of employment as the labor market is being balanced out.

The decline in the share of temporary employment, particularly in Poland, may be an effect of low unemployment level, influencing both employers and employees. Standard employment contracts bind employees more strongly to the company and reduce turnover, while employees prefer permanent over flexible employment. Additionally, inter-industry transfers likely played a role (absorbing employees from industries affected by the lockdown by industries that use flexible forms of employment to a lesser extent) (Zieliński, 2022).

For part-time employment, a response to the pandemic shock was observed only in Poland and Czechia, where shares decreased. This suggests that the effect of reducing part-time employment was stronger than the job-sharing effect (reducing hours in full-time employment.

The "entrepreneurship out of necessity" effect (Dvouletý, 2017; Zieliński, 2019) was confirmed in all V4 countries in response to the pandemic crisis, with the weakest effect in Slovakia. The share of self-employment increased in the first quarters after the shock. Notably, by Q1 2021, the share of self-employment in Czechia and Slovakia had dropped below Q1 2020 levels. During the Ukraine war, the share of self-employment increased only in Czechia and Poland.

The decrease in the share of flexible forms of employment will limit the negative phenomena associated with them (employment instability, worse working and employment conditions, lower social security, etc.), which will improve the situation of people deriving income from work. Employers will be forced to take actions for employees in line with social responsibility, in order to stabilize employment. As the labor market approaches equilibrium, the share of flexible employment forms tends to decrease, driven by employees' expectations for job stability and employers' desire to reduce fluctuations and ensure greater employment stability.

The possibility of generalizing the research findings is limited because of the specificity of the analyzed countries, which were characterized by low unemployment levels (except Slovakia) before the economic shocks occurred.

Taking into account the results obtained, future research will aim to identify the reasons behind the V4 economies' success in maintaining high economic activity of the population and low unemployment rates despite economic crises. Potential factors include high levels of employee education (human capital) and the attraction of foreign direct investment (FDI) due to lower labor costs compared to the EU14 countries (Prohorovs, Bistrova 2022; Antohi et al., 2019; Schwabe, 2021).

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# Appendix

**Table 3.**
*Temporary employment - number (thousands) and percentage share in total employment*

| Quarter/ Year | Czechia | | Hungary | | Poland | | Slovakia | |
|---|---|---|---|---|---|---|---|---|
| | Employ. | % | Employ. | % | Employ. | % | Employ. | % |
| 1/2019 | 320.7 | 6.3 | 246.1 | 5.6 | 2894.3 | 17.8 | 158.8 | 6.3 |
| 2/2019 | 335.9 | 6.6 | 255.5 | 5.8 | 2920.1 | 17.7 | 160.5 | 6.4 |
| 3/2019 | 318.8 | 6.2 | 268.9 | 6.1 | 2787.2 | 16.8 | 165.3 | 6.5 |
| 4/2019 | 315.4 | 6.1 | 236.3 | 5.4 | 2704.0 | 16.3 | 173.8 | 6.8 |
| 1/2020 | 283.1 | 5.5 | 238.1 | 5.5 | 2513.1 | 15.2 | 152.0 | 6.1 |
| 2/2020 | 278.6 | 5.5 | 202.0 | 4.7 | 2406.2 | 15.1 | 130.4 | 5.3 |
| 3/2020 | 294.4 | 5.8 | 228.3 | 5.3 | 2355.3 | 14.8 | 130.5 | 5.3 |
| 4/2020 | 295.3 | 5.8 | 210.5 | 4.8 | 2214.6 | 13.3 | 120.2 | 4.8 |
| 1/2021 | 278.2 | 5.6 | 216.9 | 4.9 | 2098.0 | 12.7 | 68.2 | 2.8 |
| 2/2021 | 298.6 | 6.0 | 232.5 | 5.2 | 2025.0 | 12.2 | 79.8 | 3.2 |
| 3/2021 | 250.4 | 4.9 | 239.4 | 5.3 | 1839.2 | 10.9 | 98.6 | 3.9 |
| 4/2021 | 239.3 | 4.7 | 212.7 | 4.7 | 1914.1 | 11.4 | 95.8 | 3.7 |
| 1/2022 | 234.8 | 4.7 | 206.1 | 4.6 | 1960.2 | 11.7 | 83.3 | 3.3 |
| 2/2022 | 253.7 | 5.1 | 205.9 | 4.5 | 2075.3 | 12.4 | 91.2 | 3.6 |
| 3/2022 | 252.4 | 5.0 | 215.3 | 4.7 | 2046.1 | 12.3 | 96.0 | 3.7 |
| 4/2022 | 246.3 | 4.9 | 206.1 | 4.5 | 1991.1 | 11.9 | 90.4 | 3.5 |
| 1/2023 | 246.8 | 5.1 | 184.3 | 4.1 | 2042.6 | 12.2 | 83.9 | 3.3 |
| 2/2023 | 274.1 | 5.6 | 197.7 | 4.3 | 2014.6 | 12.0 | 96.2 | 3.8 |
| 3/2023 | 282.0 | 5.8 | 203.2 | 4.5 | 1942.3 | 11.6 | 91.9 | 3.6 |
| 4/2023 | 295.1 | 6.0 | 187.5 | 4.1 | 1999.3 | 11.9 | 85.5 | 3.3 |
| 1/2024 | 309.0 | 6.2 | 190.0 | 4.2 | 1969.9 | 11.8 | 82.6 | 3.3 |
| 2/2024 | 304.6 | 6.1 | 189.1 | 4.1 | 1937.7 | 11.6 | 77.3 | 3.0 |
| 3/2024 | 305.1 | 6.1 | 190.0 | 4.2 | 1965.0 | 11.8 | 80.1 | 3.1 |
| 4/2024 | 302.7 | 6.1 | 169.4 | 3.7 | 1972.3 | 11.8 | 75.1 | 2.9 |

Source: Eurostat database: Labour market, Employment and activity, Part-time employment and temporary contracts (age from 20 to 64 years).

**Table 4.**
*Part-time employed - number (thousands) and percentage share in total employment*

| Quarter/ Year | Czechia | | Hungary | | Poland | | Slovakia | |
|---|---|---|---|---|---|---|---|---|
| | Employ. | % | Employ. | % | Employ. | % | Employ. | % |
| 1/2019 | 325.3 | 6.3 | 190.1 | 4.3 | 1003.0 | 6.2 | 107.0 | 4.2 |
| 2/2019 | 318.3 | 6.2 | 191.0 | 4.4 | 1017.0 | 6.2 | 109.9 | 4.4 |
| 3/2019 | 307.8 | 6.0 | 193.7 | 4.4 | 941.6 | 5.7 | 117.3 | 4.6 |
| 4/2019 | 305.5 | 6.0 | 181.9 | 4.1 | 958.8 | 5.8 | 119.8 | 4.7 |
| 1/2020 | 299.1 | 5.9 | 200.3 | 4.6 | 1007.5 | 6.1 | 109.8 | 4.4 |
| 2/2020 | 281.4 | 5.6 | 233.2 | 5.5 | 960.5 | 5.9 | 116.8 | 4.8 |
| 3/2020 | 280.5 | 5.5 | 199.9 | 4.6 | 917.1 | 5.5 | 109.1 | 4.4 |
| 4/2020 | 274.6 | 5.4 | 185.8 | 4.3 | 911.2 | 5.5 | 107.7 | 4.3 |
| 1/2021 | 271.5 | 5.4 | 207.6 | 4.7 | 912.8 | 5.5 | 80.6 | 3.3 |
| 2/2021 | 283.2 | 5.7 | 203.8 | 4.5 | 887.3 | 5.3 | 75.8 | 3.0 |
| 3/2021 | 269.1 | 5.3 | 198.3 | 4.4 | 795.4 | 4.7 | 75.2 | 3.0 |
| 4/2021 | 291.8 | 5.7 | 199.6 | 4.4 | 789.2 | 4.7 | 78.3 | 3.1 |
| 1/2022 | 278.5 | 5.6 | 187.1 | 4.1 | 872.1 | 5.2 | 79.3 | 3.1 |
| 2/2022 | 290.2 | 5.8 | 188.6 | 4.2 | 937.2 | 5.6 | 80.6 | 3.2 |
| 3/2022 | 301.2 | 6.0 | 189.0 | 4.2 | 860.1 | 5.2 | 79.3 | 3.1 |
| 4/2022 | 304.8 | 6.1 | 187.6 | 4.1 | 837.5 | 5.0 | 75.2 | 2.9 |
| 1/2023 | 312.9 | 6.5 | 179.5 | 4.0 | 954.8 | 5.7 | 71.2 | 2.8 |
| 2/2023 | 315.0 | 6.5 | 176.8 | 3.9 | 932.7 | 5.6 | 78.1 | 3.1 |
| 3/2023 | 330.5 | 6.8 | 168.0 | 3.7 | 882.0 | 5.3 | 86.6 | 3.4 |
| 4/2023 | 344.9 | 7.1 | 191.7 | 4.2 | 933.1 | 5.6 | 98.6 | 3.8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/2024 | 366.9 | 7.3 | 188.0 | 4.1 | 921.1 | 5.5 | 97.1 | 3.8 |
| 2/2024 | 367.4 | 7.4 | 189.2 | 4.2 | 939.4 | 5.6 | 99.8 | 3.9 |
| 3/2024 | 376.1 | 7.6 | 188.4 | 4.1 | 947.5 | 5.7 | 100.1 | 3.9 |
| 4/2024 | 379.5 | 7.6 | 191.2 | 4.2 | 843.3 | 5.1 | 94.6 | 3.7 |

Source: Eurostat database: Labour market, Employment and activity, Part-time employment and temporary contracts (age from 20 to 64 years).

**Table 5.**

*Self-employed - number (thousands) and percentage share in total employment*

| Quarter/ Year | Czechia | | Hungary | | Poland | | Slovakia | |
|---|---|---|---|---|---|---|---|---|
| | Employ. | % | Employ. | % | Employ. | % | Employ. | % |
| 1/2019 | 816.4 | 15.9 | 435.2 | 9.9 | 2834.9 | 17.4 | 365.4 | 14.4 |
| 2/2019 | 812.7 | 15.9 | 435.4 | 9.9 | 2899.5 | 17.6 | 384.3 | 15.2 |
| 3/2019 | 814.3 | 15.9 | 439.7 | 10.0 | 2908.6 | 17.5 | 383.2 | 15.1 |
| 4/2019 | 798.2 | 15.6 | 462.7 | 10.5 | 2854.7 | 17.3 | 373.7 | 14.7 |
| 1/2020 | 804.8 | 15.7 | 471.3 | 10.9 | 2909.8 | 17.7 | 368.9 | 14.7 |
| 2/2020 | 800.6 | 15.8 | 482.3 | 11.3 | 2900.0 | 17.8 | 366.0 | 14.9 |
| 3/2020 | 803.1 | 15.9 | 484.5 | 11.2 | 2976.0 | 18.0 | 361.9 | 14.6 |
| 4/2020 | 798.0 | 15.8 | 507.1 | 11.7 | 2998.8 | 18.1 | 368.3 | 14.8 |
| 1/2021 | 761.4 | 15.2 | 509.1 | 11.5 | 2956.8 | 17.9 | 350.1 | 14.2 |
| 2/2021 | 750.6 | 15.0 | 523.5 | 11.7 | 2949.3 | 17.7 | 369.1 | 14.8 |
| 3/2021 | 768.8 | 15.1 | 533.8 | 11.8 | 3061.8 | 18.2 | 375.7 | 14.8 |
| 4/2021 | 773.9 | 15.2 | 536.3 | 11.8 | 3029.6 | 18.1 | 377.7 | 14.7 |
| 1/2022 | 743.0 | 14.9 | 534.5 | 11.8 | 3042.8 | 18.2 | 380.2 | 15.0 |
| 2/2022 | 756.5 | 15.2 | 531.2 | 11.7 | 3099.4 | 18.5 | 377.8 | 14.8 |
| 3/2022 | 766.0 | 15.3 | 537.6 | 11.8 | 3029.5 | 18.2 | 363.5 | 14.2 |
| 4/2022 | 769.1 | 15.3 | 535.4 | 11.8 | 3049.5 | 18.2 | 371.7 | 14.5 |
| 1/2023 | 752.2 | 15.6 | 521.2 | 11.5 | 3073.4 | 18.3 | 377.5 | 14.9 |
| 2/2023 | 776.6 | 15.9 | 515.3 | 11.3 | 3157.9 | 18.8 | 370.6 | 14.5 |
| 3/2023 | 778.2 | 16.0 | 525.5 | 11.5 | 3174.8 | 18.9 | 381.7 | 15.0 |
| 4/2023 | 779.0 | 16.0 | 507.3 | 11.1 | 3124.0 | 18.6 | 389.5 | 15.1 |
| 1/2024 | 784.0 | 15.7 | 487.3 | 10.7 | 3021.7 | 18.1 | 379.0 | 14.9 |
| 2/2024 | 745.1 | 15.0 | 500.8 | 11.0 | 2987.9 | 17.9 | 366.1 | 14.3 |
| 3/2024 | 739.6 | 14.9 | 498.8 | 10.9 | 2980.7 | 17.8 | 370.6 | 14.6 |
| 4/2024 | 740.3 | 14.8 | 497.8 | 11.0 | 2947.3 | 17.7 | 373.9 | 14.5 |

Source: Eurostat database: Labour market, Employment and activity, Self employed (age from 20 to 64 years).