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Article

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The Determinants of Unemployment: CSEE Countries Panel Data Analysis

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Abstract

This paper deals with the analysis of the determinants of unemployment for the Central-Eastern and South-Eastern (CSEE) European countries: Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria and Croatia. The comprehensive analysis for the observed period from 2012 to 2020 provides important insights into the homogeneity of the determinants of unemployment and the efficiency of the CSEE labour markets. A panel analysis has been conducted by OLS-PCSE method for CSEE countries and an additional analysis for two CEE and SEE subsamples. Gross fixed capital formation, interest rate and active labour market policies had a statistically significant impact on CSEE panel level, which was confirmed by the analysis conducted on subsamples. Active labour market policies expenditures had a stronger impact on reducing unemployment compared to gross fixed capital formation. Only the interest rate had a positive statistical effect on unemployment. Macroeconomic and institutional variables had almost identical effects on unemployment and their labour markets reacted very similarly. ALMP had the strongest impact on unemployment trends of the observed groups of countries. Further increased expenditures in ALPM policies and their complementary with PLMP are needed in a manner to further enhance labour market efficiency.

Keywords

Labour market, Unemployment, Panel data analysis, CSEE, CEE, SEE

JEL Classification

E02, J01, J11

Introduction

Unemployment is one of the key indicators of the situation in the labour market, which is often taken as an indicator of the economic situation in the economy and the labour market efficiency. Nevertheless, despite other important factors in the labour market, the research still produced some restricted and quite imperfect conclusions. Yet, one indicator failed to depict realistically the status of labour force in the labour market (Wadsworth, 2002; Tasci and Zenker, 2011; Filho, 2012) because the market is peculiar in many ways. These specifics arise primarily from demographic, socio-psychological, ethnic, migration and other factors (Dražković et al., 2021). Unemployment is an extremely complex notion and therefore it is not at all easy to find an unambiguous explanation for its cause. However, in order to find solutions to suppress the unemployment, it is necessary to explore its determinants (Tomić, 2013).

The paper deals with the determinants of unemployment of the former planned economies of CSEE countries: Poland, the Czech Republic, Slovakia and Hungary, Romania, Bulgaria and Croatia. The observed countries began their process of transitioning economies from socialist to capitalist management in the 1990s, facing almost identical problems such as a significant drop in production, high unemployment and inflation. Rollnik-Sadowska and Jarocka (2021) stated that the observed groups of countries underwent a different institutional transformation and had different paths of economic development during the transition period. Now they are all EU member countries. Poland, the Czech Republic, Slovakia and Hungary joined the EU in 2004 while Romania and Bulgaria joined in 2007 and Croatia in 2013. By joining the EU, countries harmonise their labour market institutions and policies, and increase their labour market flexibility. Countries also have the opportunity to use EU funds, which affects economic activity and better convergence with developed countries.

First, a panel analysis was conducted for all observed CSEE countries, while an additional analysis was performed on a sample of CEE and SEE countries to discern whether there differ or resemble in any way. The analysed CEE countries are Poland, the Czech Republic, Slovakia and Hungary, while the SEE countries are Romania, Bulgaria and Croatia. CEE countries have previously joined the EU, unlike SEE countries, which has proven to be an extremely important factor. CEE countries are more economically developed with lower unemployment rates and

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have more flexible labour markets. For the above reasons, the observed groups of countries are suitable for comparing mutual determinants of unemployment and establish their potential differences.

The paper provides a better understanding of the phenomenon of unemployment and the efficiency of the labour markets of the CSEE, CEE and SEE group of countries. The aim of this paper is to determine the significance of unemployment determinants for CSEE, CEE and SEE group of countries in the period from 2012-2020. We decided to conduct an analysis for this period due to the unavailability of all data on determinants of unemployment. In our panel models we used a wide range of macroeconomic and institutional variables that were available for the observed period. By analysing the homogeneous determinants of unemployment over a long period, we can gain important insights into the efficiency of the labour market and its policies at the level of CSEE, CEE and SEE group of countries. The observed period is relatively new (2012-2020) and covers the period in which all concerned countries were EU member states (except Croatia, which became a member in 2013). The observed period also covers the time after economies emerged from the great global economic crisis of 2008 until the emergence of a new crisis caused by the COVID-19 virus.

This paper is structured in the following way: the second chapter provides theoretical and empirical literature overview of important determinants of unemployment and provides a better understanding of the phenomenon of unemployment, which is extremely complex given its dependence on many factors and relations in the economy. The third chapter "Data and methodology" describes the data and methodology used to obtain the results of panel regression analysis. The fourth chapter "Results" presents the obtained results of empirical analysis which are discussed in the fifth chapter "Discussion". The last sixth chapter "Conclusion" presents the most important conclusions.

The determinants of unemployment literature review

An analysis of the available literature shows that there is a large amount of research on the determinants of unemployment. The authors have covered various countries that differ in their development, economic structure, labour market flexibility, analysed in different time periods. It is worth noting that in the literature dealing with regression analysis of unemployment determinants, authors such as Logarušić and Raguž-Krištić (2019), Bayrak and Tatli (2018), Maqbool et al. (2013), Alrayes and Wadi (2018), Folawewo and Adeboje (2017) use only macroeconomic variables in their analysis, while authors such as Pesliakaite (2016), Bassanini and Duval (2006), Baccaro and Rei (2006), Flaig and Rottmann (2011), Avdagić and Salardi (2013) use only institutional variables. We also have authors who used a mixed approach in their models using macroeconomic and institutional variables such as Stockhammer et al. (2014), Orlandi (2012), Ductor and Daryna (2020), Aktugan and Dogan (2021) who reviewed the issue of unemployment comprehensively.

The macroeconomic variables used in the analysis of unemployment trends are, for example, the GDP growth rate, inflation, investment and long-term interest rates. In the middle of the last century, A. Okun was among the first to notice a negative link between the unemployment rate and GDP. According to theoretical assumptions, an increase in economic activity will lead to a decrease in unemployment, as found out by authors such as Soyulu et al. (2018) and Siddiqi (2021) while for example Folawewo and Adeboje (2017) and Purnama Trimurti and Komalasari (2014) failed to obtain a statistically significant impact of GDP growth rate on unemployment. Theoretical assumptions about the impact of individual variables in practice do not presume a statistically significant impact and may even have the opposite sign. Investments that imply investing in fixed capital are extremely important for sustainable economic growth and development. According to theoretical assumptions, investments have a negative impact on unemployment because the increase of gross fixed capital formation leads to the need to increase employment. In their empirical research, authors such as Logarušić and Raguž Krištić (2019), Alrayes and Waldi (2018), Heimberger et al. (2017) confirm theoretical assumptions about the negative impact of investment on unemployment. Apart from the demand for products and services, investments are also affected by the interest rate, which is also studied in the literature as a determinant of unemployment. Rising interest rates increase citizens' savings while reducing demand for products and services. Lower aggregate demand leads to a decline in economic activity. This shows a positive impact of interest rates on unemployment as stated by authors such as Stockhammer et al. (2014) and Sturn (2011). Furthermore, the theoretical link between inflation and the unemployment rate is positive. Inflation reduces the real money supply, increases interest rates and thus negatively affects production, which increases unemployment. However, authors such as Maqbool et al. (2013), Arslan and Zaman (2014) and Bayrak and Tatli (2018) in their research conclude that increasing inflation can also lead to lower unemployment.

Institutional variables that are most often used in the analysis of unemployment trends are employment protection legislation, active and passive labour market policies, tax wedge, minimum wage and others. The theoretical assumption is that increasing institutional variables will increase unemployment except for active labour market policies that should reduce unemployment. Employment protection legislation includes a vast number of legal norms concerning procedures related to employment and dismissal of workers. By reducing the stringency of employment protection regulation, countries increase employment and consequently reduce unemployment (Aleksynska and Eberlein, 2016; Muller and Berger, 2013; Heimberger, 2020). Brandt et al. (2005) state that active

labour market policies help people acquire new knowledge, experience and skills, thus increasing labour market efficiency and reducing unemployment. Active labour market policies consist of expenditure on training, employment incentives, direct job creation and start-up incentives. Authors such as Pesliakaite (2016), Bassanini and Duval (2006), Aktugan and Dogan (2021) have found that ALMP have a statistically significant negative impact on unemployment. Passive labour market policies are introduced primarily for material assistance to the unemployed in the form of unemployment benefits, but also include incomes that facilitate early retirement. Obadić (2003) stated that over time, expenditures for passive labour market policies are declining in order to encourage the unemployed to search for work. If passive labour market policies increase unemployment, then they are not effective, and it is necessary to establish such activation strategies that would encourage the unemployed to actively look for work. Unemployed people should be provided with greater benefits from work than from receiving social benefits (Južnik Rotar, 2018). Authors such as Guzman (2014) and Bušelić and Bosna (2019) conclude that passive labour market policies have a significant impact on increasing unemployment because generous expenditure on unemployment benefits affects passivity in job search.

The increase of the labour taxation costs increases the cost of labour, which reduces the demand for labour. Tax wedge is the difference between the gross and net salary that a worker receives and its increase results in an increase in unemployment as found out by authors such as Kovtun et al. (2014), Orlandi (2012), Bassanini and Duval (2006) and many others. The minimum wage is the minimum amount of compensation a worker receives for work performed in order to meet his or her basic needs. An increase in the minimum wage causes an increase in the number of unemployed persons according to Greer et al. (2014) or Blanchard and Wolfers, (2000).

The results of recent research on unemployment determinants are presented below, which primarily refers to European countries with an emphasis on CEE and SEE countries. Matuzevičiute et al. (2017) analysed unemployment determinants in 25 EU countries through a panel regression for the period from 2000 to 2012 and found a significant impact of economic growth, foreign direct investment, government spending, and inflation on unemployment, while technological innovation, taxes and trade union organisations did not constitute significant variables in explaining the unemployment trend. Logarušić and Raguž Kristić (2019) dealt with (only) macroeconomic determinants of unemployment of all EU-28 member states by conducting a GMM dynamic panel analysis for the period from 1995 to 2016. The investments, real long-term interest rates and inflation have proven to be significant in explaining the unemployment rate at the EU level. The authors also conducted an additional panel analysis on the EU-13 sample, and only the interest rate had a statistically significant negative impact on unemployment. Hristov and Roeger (2020) also investigated the determinants of unemployment for the EU-28 countries for the period from 1985 to 2018, using only institutional variables. The main determinants of unemployment trends are labour tax wedge, unemployment benefit replacement rate and spending on active labour market policies.

Soylu (2018) analysed the impact of GDP on the trend in the unemployment rate of Eastern European countries in the period from 1992 to 2014 through a panel analysis and found that there was a significant impact of economic growth on reducing unemployment. Miyamoto and Suphaphiphat (2021) researched unemployment determinants for 25 European countries for the period from 2000 to 2018 using panel analysis. The research concluded that the GDP growth rate has a statistically significant impact as well as individual components of active labour market policies. It is worth noting that investment in training and incentives to start businesses had a stronger impact on unemployment as opposed to the GDP growth rate. Unemployment rates in Europe are linked to a growing discrepancy between labour supply and demand for labour market skills, despite growing labour market flexibility. A similar result was reached by the authors Aktugan and Dogan (2021) who observed the determinants of unemployment of nine OECD countries for the period from 1991 to 2016. Active labour market policies have been institutional variables that have a significant impact on reducing unemployment in the context of increasing labour market deregulation.

Data and methodology

In order to examine the impact of selected factors on the unemployment of CSEE countries, a balanced panel analysis for the period from 2012 to 2020 was conducted, using annual data. Gujarati (2004) states that by combining time series for a set of different observed units, panel regression provides better quality results, greater variability, less collinearity between variables, more degrees of freedom and greater efficiency. In contrast to individual time series, regression panel better observes and measures the effects and enriches the empirical analysis.

The dependent variable is the unemployment rate (UNE) while the macroeconomic independent variables are: GDP growth rate (GR), gross fixed capital formation as % of GDP (GFCF) which is an indicator of investment, inflation measured by annual change in consumer price index (INF), real long term interest rate (IR), and labour market institutional variables are: expenditures for active labour market policies as % of GDP (ALMP), and expenditures for passive labour market policies as

% of GDP (PLMP), which indicate their effectiveness in suppression of unemployment. The independent

variables were selected pursuant to basic theoretical and empirical rationales used in the regression analysis literature.

Therefore, our empirical model is estimated by the following equation (1) in which i represents the country, t year, α_i is the spatially specific effect, u_t is the time-specific effect, and ε_{it} represents the error of the relation.

$$UNE_{it} = \alpha_i + \beta_1 GR_{it} + \beta_2 GFCF_{it} + \beta_3 INF_{it} + \beta_4 I_{it} + \beta_5 ALMP_{it} + \beta_6 PLMP_{it} + u_t + \varepsilon_{it} \quad (1)$$

Data on unemployment rate, GDP growth rate, gross fixed capital formation, inflation and real long-term interest rate were collected by the World Bank and data on ALMP and PLMP were retrieved from Eurostat database. We have conducted the analysis for the period from 2012 to 2020 because before 2012 we could not find data for active and passive labour market policies expenditures as % of GDP, which primarily refers to SEE countries. Also, we were unable to find data for other institutional variables for all observed countries from 2012 to 2020, so they were not included in the comparative analysis. Data on institutional variables are often very scant, especially for the developing countries. If we included additionally any of the independent variables, then it would be necessary to shorten the time series, creating a situation with a larger number of independent variables than time series length, which violates the basic premise of regression analysis.

In order to be able to decide on the most appropriate method of regression analysis, we first tested the stationarity of the variables. Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) panel unit root tests were applied to test the stationarity of the data as an important prerequisite for conducting the analysis (Pesaran, 2012). LLC and IPS tests have been used to test individual and common unit root process in which null hypotheses are "series have unit root process". If the time series are not stationary, the results obtained may be false. All observed variables are stationary at level and are integrated of order zero $I(0)$ as shown in table 1 (in appendix). Therefore, estimation can be made by using the least square panel method (Bayrak and Tatli, 2018, Folawewo and Adeboje, 2017).

Intending to determine whether the fixed effect model (FEM) or random effect model (REM) is correct, we conducted the Hausman (1978) test whose null hypothesis is "REM model is appropriate". The obtained results indicate the justification of using the FEM model since the p-value is less than 5%.

Frequent feature of time-series cross-sectional data is heteroscedasticity and autocorrelation in the residuals, so we tested our initial model for these usual problems. The results can be biased if a model is pervaded with these problems. Wald test was performed to detect possible cross section heteroscedasticity which suggests its existence since the test is statistically significant (p-value less than 0.05). In addition to heteroscedasticity, autocorrelation was also tested using the Wooldridge test (Wooldridge, 2002), which indicates the presence of autocorrelation in the residuals of the evaluated model. Since P-value is less than 5% we have concluded that our model has a problem with autocorrelation. The results of the diagnostic tests are presented in table 2.

Table 2. Diagnostic tests.

Diagnostic tests	Statistic tests
Wald test	54,896*** (0,000)
Wooldridge test	16,512*** (0,000)
Hausman test	92.815*** (0,000)

Source: made by author (2022)

Given that our model has a problem with heteroscedasticity and autocorrelation, it is necessary to conduct an ordinary least squares (OLS) model with panel-corrected standard errors (PCSE) to ensure robustness of the results. Heteroscedasticity-robust controls both cross-sectional dependence and autocorrelation of residuals (Hristov and Roeger, 2020). This procedure gives confidential results especially for those models that do not have much more observations (years) than the number of cross-sections (Beck and Katz, 1995), which is exactly the case with our panel. According to Bailey and Katz (2011) PCSE procedure gives reliable results and was used by authors such as Bacaro and Rey (2005), Avdagić and Salardi (2013) and Heimberger et al. (2017). After we conducted country fixed effect OLS-PCSE model for CSEE countries, we additionally conducted fixed effect OLS-PCSE models for the CEE and SEE countries as sub-groups to determine if there is any difference between CEE and SEE countries.

Results

The results of the research are shown in Table 3. The statistically significant variables in our CSEE group (1) model were GFCF, IR and ALMP while GR, INF, PLMP did not appear to be statistically significant. The only variable that had a positive statistically significant impact on unemployment at the CSEE panel level is IR. If the IR increases by

one percentage point, then unemployment will increase by 0.43 percentage points. Inflation also increased unemployment in the observed period, except that its impact was not statistically significant. Variables which increase significantly affected the reduction of unemployment are GFCF and ALMP. ALMP had the strongest impact on reducing unemployment. If ALMP expenditures increase by 1 percentage point, then unemployment will decrease by 2.11 percentage points. GFCF had a much smaller impact on reducing unemployment. Increasing the GFCF by one percentage point reduces the unemployment for 0,16 percentage point.

Table 3. Results of the OLS-PCSE models.

Variable	CSEE group (1)	CEE group (2)	SEE group (3)
GR	-0,0747 (-0,4963)	-0,0633 (-0,8086)	-0,1447 (-1,0812)
GFCF	-0,1668* (-1,7958)	-0,1768*** (-3,5016)	-0,8474*** (-4,7818)
INF	0,2077 (0,8229)	0,3902** (2,1883)	-0,3601 (-1,3343)
IR	0,4362*** (3,3145)	0,5375*** (5,8653)	1,1522*** (7,8082)
ALMP	-2,1184** (-2,2123)	-0,9488* (-1,9340)	-5,5998* (-1,9365)
PLMP	0,0236 (0,0159)	0,1251 (0,5151)	0,0620 (0,4255)
R2	0,9611	0,9903	0,9861
F-statistics	52,0140***	108,2739***	44,3413***

Note: ***, ** and * refer to 1%, 5% and 10% of the levels of statistical significance. Below the coefficients in parentheses is the t-statistics. **Source:** made by author (2022)

In the CEE group (2) model, statistically significant variables are GFCF, INF, IR and ALMP, while GR and PLMP are not statistically significant. The variables INF and IR had a statistically significant positive impact on unemployment. The strongest positive impact was exerted by the INF, which rise by 1 percentage point increased unemployment by 0.53 percentage points. Inflation had a slightly weaker impact on unemployment, which rise by one percentage point increased unemployment by 0.39 percentage points. The variables GFCF and ALMP had a statistically significant negative impact on unemployment, of which ALMP had the strongest impact. An increase in ALMP by one percentage point reduced unemployment by 0.94 percentage points, while an increase in GFCF by one percentage point reduced unemployment by 0.17 percentage points.

When we observe the results of the SEE group (3) model, we distinguish that the variables GFCF, IR and ALMP had a statistically significant impact on unemployment as opposed to GR, INF and PLMP. The strongest negative impact on unemployment had ALMP, which increase by one percentage point reduced unemployment by as much as 5.59 percentage points. In addition to ALMP, GFCF also had a significant negative impact on unemployment. Increasing the GFCF by one percentage point reduced unemployment by 0.84 percentage points. IR had a positive statistically significant impact on unemployment which rise by one percentage point increased unemployment by 1.15 percentage points, which is a rather strong positive impact.

Discussion

When we take into account the results of the CSEE panel and compare them with the results of the sub-group of CEE and SEE models, we perceive that the results are quite similar. In all models GR, PLMP and INF did not have a statistically significant impact except for CEE panel where INF is statistically significant. All other variables such as GFCF, IR, and ALMP had a statistically significant impact.

GR had an expected negative impact on all panels, which confirms the existence of Okun's law. However, GR did not have a statistically significant impact, which indicates that the increase in economic activity has limited employment opportunities. Although there is a link between increasing economic activity and reducing unemployment, it is very weak, and we have growth in the economy without significant employment opportunities (Herman, 2012). In order for economic growth to have a significant impact on reducing unemployment, much higher economic growth rates are needed that could ensure an increase in the number of jobs. Only when labour is fully utilized can output grow faster than the rate of labour productivity, and firms then begin to hire additional workers (Levine, 2013).

Authors such as Bieszk-Stolorz and Dmytrów (2020), Scutariu (2015) and Hulényi (2016) state that significant

economic progress of the CEE group after EU accession is evident. Ambroziak (2020) asserts that CEE countries are today sixth largest economic force in Europe with an increasingly important industrial sector. However, Paweta (2018) point out that the GDP growth rate of the observed countries was higher in the pre-crisis period than in the post-crisis period, which indicates a slowdown in economies. Szabo (2020) state that future economic progress will require the transformation of production using automation, robotics and digitisation in general, which suggests that employees in the future need to master advanced digital skills they do not possess sufficiently. Kádár (2017) states that educational institutions should provide not only theoretical knowledge but also practical knowledge that will enable stronger economic growth and development, increase the competitiveness and employability of the workforce.

Radosavljević et al. (2020) state that the accession of SEE countries to the EU also significantly affected their economic development. However, despite economic progress, SEE countries are today the least developed region in the EU and their convergence process towards developed countries is slow and inadequate. Grela et al. (2017) states that it should be borne in mind that the post-transition growth model based on large inflow of foreign capital has reached its limit thus allowing the beneficial effects on economic growth to disappear. In the future, economic growth and convergence with developed European countries will be driven mainly by factors affecting structural competitiveness, especially innovation activity, institutional environment and demographic policies. Authors such as Kurečić (2014), Zielinski (2020) and Bosna (2018) state that SEE countries have benefited much less from joining the EU than CEE countries that have more flexible labour markets, average lower unemployment rates and are economically stronger.

The observed groups of countries statistically significantly reduce unemployment by increasing investments in gross fixed capital. Increasing investment in fixed capital leads to increased production and job creation. The share of investments in GDP should have the largest quota possible for economic growth to be sustainable. Thus, the impact of GDP should have a statistically significant negative impact on unemployment. The GFCF had the strongest influence with the SEE group of countries, which are otherwise less developed countries, and which joined the EU after the CEE countries. For this reason, we can interpret that SEE countries have recorded a greater elasticity of capital accumulation in reducing unemployment in contrast to CEE countries. As reported by Radosavljević et al. (2020), in order to achieve future growth and convergence, it is necessary to strongly encourage innovation and capital accumulation. In addition, the increase in long-term real interest rates is a significant constraint in increasing investment activity and reducing unemployment. The strongest impact of interest rates on rising unemployment is visible in SEE countries. Peša et al (2017) state that CEE countries are economically stronger than SEE countries and much better financially integrated with the rest of Europe and have more favourable and secure lending conditions, which may explain the stronger impact of interest rates on unemployment in SEE countries.

ALMP had an extremely strong impact on reducing unemployment in all countries, which is especially evident in the SEE group of countries. SEE countries have a bigger problem with structural unemployment, their labour market is less flexible and therefore better adjustment of supply and demand in the labour market leads to a reduction in long-term unemployment. Active labour market policies are extremely important in the fight against unemployment and raising efficiency in the labour market. Decision-makers need to work on mobilizing the workforce as much as possible due to labour shortages, with active labour market policies playing an important role (Keese, 2020; Hastings and Heyes, 2016). Hristov and Roeger (2020) state that CEE and SEE countries have significantly increased expenditures for ALMP and reduced levels of unemployment benefits making work income more attractive.

Pignatti and Van Belle (2018) emphasize that the interaction between interventions on ALMP and PLMP is crucial. In the case of developed economies, even spending in passive policies can decrease unemployment if sufficient amounts are spent in active interventions. Our expenditures for PLMP were not statistically significant and had positive sign which suggests that further investment in ALPM policies and their interactions with PLMP is needed.

Olishevych and Lukanenko (2019) state that effective labour market policies are needed to increase the activity of the population in order to develop the labour market, enable effective employment and professional development of human capital in the form of lifelong learning, especially as the working population is declining. As reported by Miyamoto and Suphaphiphat (2021) due to technological advances and digitization, there is a growing need for digital skills that are lacking in the labour market. Of the training programs, it is especially worth mentioning the investment in digital skills.

Conclusion

The research showed that gross fixed capital formation, interest rate and active labour market policies has had a statistically significant impact on unemployment at the level of the SCEE panel group in the period from 2012 to 2020, which is confirmed by the analysis conducted on subsamples. Of all the observed variables, ALMP expenditure stands out with its strong negative effect on unemployment. It is important to note that ALMP had a stronger impact on reducing unemployment as opposed to GFCF. The GDP growth rate did not have a statistically

significant impact on unemployment, which means that we have jobless growth in the observed groups of countries. Only the interest rate had a positive impact on unemployment, so we can assume that the reduction in long-term interest rates has a negative impact on unemployment, given that then they encourage the consumption of this investment. Macroeconomic and institutional variables have almost identical effects on unemployment and their labour markets react very similarly. The latter is an indicator of the increased degree of economic and institutional integration in the form of implementation of recommendations and guidelines defined by the EU. Given that ALMP have had the strongest impact on unemployment trends, we can conclude that countries are effectively implementing their ALMP. However, further investments in ALPM policies and their interactions with PLMP are needed in a manner to enhance labour market efficiency. The paper contributes to the existing economic literature because it provides a better insight into the determinants of unemployment of the observed post-transition EU member group countries in the relatively new observed period (2012-2020) that refers to the period after the economies left the great world crisis of 2008 until the emergence of the new crisis caused by COVID-19 virus. In our best manner, the authors have so far not dealt with the observed panel group of countries, especially taking into account the above macroeconomic and institutional variables of post-transition EU member states for the relatively fresh period of observation. Recommendations for future research are focused on analysing the effectiveness of individual components of the ALMP to distinguish the extent to which individual components contribute to combating unemployment in CSEE group of countries, but also the inclusion of demographic variables given that all these countries and the rest of the European countries are fighting negative demographic trends. Analysis of the effectiveness of the implementation of demographic policies and their impact on unemployment trends should also be investigated in future research.

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Appendix

Table 1. The stationarity - LLC and IPS unit root tests.

Variable	UNE	GR	GFCF	INF	IR	ALMP	PLMP
LLC t-stat statistics (in level)	-6,11***	-2,46***	-1,89**	-6,36***	-3,09***	-4,03**	-5,23***
IPS w-stat statistics (in level)	-4,52***	-1,73***	-0,63*	-3,73***	-1,93*	-7,06***	-1,68***

Note: ***, ** and * refer to 1%, 5% and 10% of the levels of statistical significance.

Source: made by author (2022)