
**Linkages Between Unemployment, FDI, Remittances, and Economic Growth:
Panel Evidence From Southeast and Eastern Europe (2012–2022)**

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Abstract

This study examines the relationship between unemployment, FDI, remittances, inflation, and GDP in 10 Southeastern and Eastern European countries Kosovo, Albania, Montenegro, Greece, Romania, Croatia, Serbia, Bulgaria, Bosnia and Herzegovina, and North Macedonia over the period from 2012 to 2022. The study uses different techniques such as pooled OLS, fixed and random effects and Hausman Taylor IV. The analysis shows that GDP is positively impacted by foreign direct investment (FDI), remittances, and moderate inflation, while an inverse relationship is observed between unemployment and GDP. Integrated strategies should be implemented to reduce unemployment, attract foreign investments, optimize remittance utilization, and maintain price stability to promote sustainable economic growth. Further research should be conducted to include detailed country-level analyses, providing deeper insights into the unique economic challenges and opportunities in Southeast and Eastern Europe. This study provides a novel contribution by examining the relationship between unemployment, remittances and GDP, offering valuable insights for the Southeast Eastern Europe Countries.

Keywords: GDP, FDI, unemployment, remittances, Southeast and Eastern Europe

1. Introduction

The relationship between unemployment, foreign direct investment (FDI), remittances, and GDP has been widely studied by policymakers and researchers due to its critical role in fostering economic stability and growth. In Southeast and Eastern Europe, a region undergoing a transition from centrally planned to market-oriented economies, these dynamics are particularly significant. Economic transformations in this region have been accompanied by fluctuations in unemployment, varying levels of FDI inflows, and a substantial reliance on remittances as a primary source of both household and national income. This paper is particularly relevant for Southeast European countries, as these economies continue to navigate the challenges associated with their transitional phase. The region faces structural issues such as persistent unemployment, reliance on external financial flows, and uneven economic growth patterns. By examining the interactions between unemployment, FDI, remittances, and GDP, this paper provides insights that can inform policymakers in addressing these challenges. Understanding these dynamics is

essential for designing policies aimed at reducing unemployment, enhancing the productive use of remittances, and attracting sustainable FDI that contributes to long-term economic development. A thorough understanding of these interactions is considered essential for the development of policies aimed at promoting sustainable growth. Over the years, numerous studies have emphasized the positive impact of remittances on economic growth (Bajra, 2021; Rausser et al., 2018; Topxhiu & Krasniqi, 2017). For instance, the reduction of unemployment through job creation facilitated by FDI has been analyzed by Blanton and Blanton (2015), while the stabilizing effects of remittances on developing economies have been highlighted by Chami et al. (2005). Additionally, Okun's Law has been extensively tested to assess the relationship between unemployment and GDP growth, with findings differing across regions and economic structures (Ball et al., 2013).

The researcher aims to address the following research questions:

- How do unemployment, foreign direct investment (FDI), remittances, and inflation impact GDP in Southeast and Eastern European countries between 2012 and 2022?

The contribution of this study is twofold. First, it provides empirical evidence on the interplay between unemployment, FDI, and remittances and their collective influence on GDP within the context of Southeast and Eastern Europe. Second, it identifies policy implications that can guide decision-makers in fostering sustainable economic growth through targeted interventions in these areas. The data sourced for this study are from the World Bank, providing a basis of comparison among ten Southeast and Eastern Europe countries among 2012-2022. Taking econometric challenges into consideration, this study employs various techniques, including pooled OLS, fixed and random effects models, as well as the Hausman–Taylor model with instrumental variables (IVs). The analysis shows that GDP is positively impacted by foreign direct investment (FDI), remittances, and moderate inflation, while an inverse relationship is observed between unemployment and GDP. The structure of this paper is as follows: Section 2 presents the literature review, Section 3 outlines the research methodology and data, Section 4 reports the results, and Section 5 concludes the study.

2. Literature review

In this section, the empirical evidence regarding the relationship between unemployment, Foreign Direct Investment (FDI), remittances, inflation, and Gross Domestic Product (GDP) is examined. Unemployment, a key macroeconomic indicator, has a significant impact on economic growth and is extensively discussed in the literature (Nielsen et al., 2015; Mügge, 2016; Wang & Le, 2018). Most studies suggest a unidirectional causal relationship, with GDP influencing unemployment (Shukur & Ghazi, 2024). However, some research indicates that high unemployment can negatively affect GDP by decreasing consumer spending, lowering productivity, and reducing overall economic output (Okun, 1962). Moreover, some researchers argue that in economies experiencing slow or negative growth, high unemployment may exacerbate GDP declines, creating a vicious cycle in which increased unemployment leads to lower demand and further economic stagnation (Blanchard & Summers, 1986). GDP is

recognized as a critical factor in regional development and economic performance (Vigliarolo, 2020), and its relationship with unemployment remains a central issue in macroeconomic analysis.

The role of FDI in driving economic growth, particularly through technology diffusion, is well-established. (Borensztein et al. 1998) concluded that FDI positively influences growth, although the magnitude of this effect depends on the human capital available in the host country. (Choe, 2003) explores the bidirectional causality between economic growth and FDI, finding that while economic growth tends to drive FDI inflows, evidence suggesting that FDI directly causes growth in the host country is limited. (Mohd and Muse, 2021) conducted a study on Ethiopia and found that foreign direct investment has a significant and positive impact on economic growth in both the short and long term. Similarly, (Makiela and Ouattara, 2018), in a study based on a sample of developed and developing countries, found that foreign direct investment contributes positively to the economic growth of host countries. However, empirical findings indicate that foreign direct investment (FDI) has a negative and statistically significant impact on economic growth in the SEE6 region (Vesna Bucevska, 2022).

Remittances have also been shown to positively impact economic growth, though the effect varies across countries (Tabit & Charaf, 2017). (Bangake et al. 2019) provided empirical evidence that remittances have a positive and significant impact on economic growth in developing countries, while aid and foreign direct investment have an insignificant impact. (Batu, 2017), in an analysis of 81 countries over the 1970–2012 period, concluded that temporary inflows of workers' remittances positively affect GDP per capita, while a permanent increase in remittances does not. For instance, remittance inflows in Romania remain stable throughout the business cycle but do not contribute to stimulating economic growth. Some studies present empirical evidence supporting a positive impact of remittances on economic growth, while others suggest that remittances have a negative influence. Additionally, several empirical studies have found no significant relationship between remittances and economic growth.

Some studies have identified a negative correlation between inflation and GDP growth. For instance, research indicates that a 1% increase in inflation can lead to a decrease in GDP growth by approximately 0.5% (Barro, 2013). Similarly, an analysis suggests that a 1% rise in inflation may result in a 0.08 percentage point reduction in GDP (Arai, Thoursie, & Kinnwall, 2004).

Conversely, other studies have found a positive relationship between inflation and economic growth. Research focusing on four South Asian countries provides evidence of a long-run positive association between GDP growth rates and inflation, indicating that moderate inflation may be conducive to economic growth (Mallik & Chowdhury, 2001).

2. Research Methodology and data

In this section, an empirical econometric model is presented to examine the relationship between unemployment, FDI, remittances, inflation, and GDP in countries across Southeast and Eastern

Europe over the period 2012–2022. Pooled OLS, fixed and random effects models, and the Hausman–Taylor IV approach (Baltagi, 2013) are employed for this purpose. This model is considered to be more consistent and efficient than the fixed and random effects.

2.1 Empirical model

A panel data regression analysis is conducted on 10 selected Southeast and Eastern European countries using annual data from 2012 to 2022. The relationship between unemployment, FDI, remittances, inflation, and GDP is examined, employing Fixed Effects (FE), Random Effects (RE), and the Hausman Taylor approach to determine the most appropriate model specification. $GDP_{it} = \alpha + \beta_1 GDP_LAG_{t-1} + \beta_2 Unemployment_{it} + \beta_3 FDI_{it} + \beta_4 Remittances_{it} + \beta_5 Inflation_{it} + \mu_i + v_{it}$

In this model, GDP_{et} serves as the dependent variable, representing the gross domestic product of country i at time t , and reflects the overall economic output. The lagged value GDP_{et-1} captures the persistence of economic growth, indicating the influence of past performance on current GDP levels. $Unemployment_{et}$ denotes the unemployment rate, serving as an indicator of labor market conditions. FDI_{et} represents foreign direct investment inflows, highlighting external investments in the economy. $Remittances_{et}$ refer to the inflows of funds sent by emigrants, often crucial for household incomes and consumption. $Inflation_{et}$ measures the rate of price changes, reflecting macroeconomic stability. Also μ_e captures country-specific unobserved effects that are time-invariant, such as institutional quality or geographic characteristics, while v_{et} represents the idiosyncratic error term that varies across countries and time periods, capturing random shocks or unexplained factors affecting GDP.

2.2 Descriptive statistics

The study utilizes panel data for 10 Southeastern and Eastern European countries: Kosovo, Albania, Montenegro, Greece, Romania, Croatia, Serbia, Bulgaria, Bosnia, and Moldova, covering the period from 2012 to 2022. The selection of this timeframe is based on the availability of complete time series data for all variables included in the model. The dataset was sourced from the World Bank (WB). To analyze the research question, disaggregated data on gdp, unemployment, fdi, remittances and inflation are also utilized. Table 1 provides a summary of the key descriptive statistics.

Table 1. Summary statistics

Variable	Obs	Mean	Std. dev.	Min	Max
GDP	110	2.40	4.06	-15.31	13.04
UNE	110	16.21	7.83	3.91	35.26
FDI	110	4.77	3.19	0.06	17.26
REM	110	7.20	4.84	0.20	18.61
INF	110	2.37	3.60	-1.74	15.33

Source: Authors calculations

3. Empirical results

In this section, the results from the pooled OLS, fixed effects, random effects, and Hausman-Taylor IV estimators are reported. Bias in the coefficient from the pooled OLS estimator is attributed to unobserved individual-specific heterogeneity. Consequently, fixed and random effects models are estimated, and the findings are presented in Table II.

Table 2. Summary results of econometric models

Variables	OLS	Fixed Effect	Random Effects	Hausman Taylor IV
	GDP	GDP	GDP	GDP
UNE	-0.0833	-0.137	-0.0833	-0.132*
s.e.	(-1.44)	(-1.38)	(-1.44)	(-1.67)
FDI	0.00381	0.405	0.00381	0.107
s.e.	(0.03)	(1.48)	(0.03)	(0.51)
REM	0.179*	-0.304*	0.179	0.0145
s.e.	(1.73)	(-0.58)	(1.73)	(0.06)
INF	0.189*	0.11*	0.189	0.336***
s.e.	(1.67)	(0.89)	(1.67)	(2.88)
GDP_Lag				-0.427***
s.e.				(-4.46)
_cons	1.991	4.622	1.991	6.157
s.e.	(1.73)	(1.09)	(1.73)	(1.41)
N	110	110	110	109
R ²	0.0942	0.1084	0.6013	
F	2.73	2.48		
Chi ²			10.92	30.83

4. Note: t statistics in parentheses

5. Note: * p<0.1, ** p<0.05, *** p<0.01

Source: Authors calculations

As per the analysis of the unemployment impact, the coefficient of (-0.132*) indicates an inverse relationship between unemployment and GDP. The negative sign suggests that as unemployment increases, GDP tends to decrease. Specifically, for a one-unit increase in the unemployment rate, GDP decreases by 0.132 units, holding other variables constant. This finding aligns with economic theories such as Okun's Law, which posits a negative relationship between unemployment and economic output. A higher unemployment rate implies lower labor utilization, which can hinder production and GDP growth.

The coefficient of 0.107 indicates a positive relationship between foreign direct investment (FDI) and GDP. This suggests that a one-unit increase in FDI is associated with a 0.107-unit increase in GDP, holding other factors constant. This finding supports the study by (Fetai, Mustafi, and Fetai, 2017), which concludes that foreign direct investment positively impacts per capita GDP

growth in Western Balkan countries. Additionally, research by (Shkodra, Ahmeti, and Krasniqi, 2024), focusing on Southeast European countries, revealed a positive and significant relationship between FDI and economic growth in several nations. However, this positive effect was not observed in Kosovo and Bosnia and Herzegovina, indicating that the impact of FDI can vary depending on the specific country context, opening the door for more country-specific analyses. The results suggest that remittances have a positive impact on economic growth in Southeast and Eastern European countries during the period from 2012 to 2022. The coefficient of 0.0145 highlights a positive relationship between remittances and GDP. (Bucevska, 2022) provides empirical evidence supporting this positive effect, demonstrating that remittance inflows contribute to economic growth in Southeast European countries. In contrast, (Cismaş et al., 2020) present evidence indicating that remittances do not stimulate economic growth in the case of Romania.

The findings reveal a positive and statistically significant relationship between inflation and GDP, suggesting that, from 2012 to 2022, inflation may have contributed to driving economic growth in Southeast and Eastern European countries. In contrast, the study by Pappas and Boukas (2025), which examines EU economies, found no strong evidence that inflation negatively affects economic growth. This implies that, within certain limits, inflation may not harm economic performance.

4. Conclusions

The analysis of the impact of unemployment, foreign direct investment (FDI), remittances, and inflation on GDP in Southeast and Eastern European countries between 2012 and 2022 provides valuable insights into the region's economic dynamics. The findings reveal an inverse relationship between unemployment and GDP, indicating that higher unemployment levels are associated with lower economic output. This underscores the critical importance of reducing unemployment to foster economic growth and enhance productivity. Policies aimed at labor market development and job creation are essential for promoting economic stability and growth in the region. A positive relationship between FDI and GDP was identified, highlighting the significance of attracting foreign investments. FDI contributes to economic development through technology transfer, capital inflow, and job creation, making it a crucial driver of growth. Enhancing the investment climate and ensuring political and economic stability are key to fully realizing FDI's potential. The analysis also confirms that remittances positively influence economic growth. Remittances play a vital role in supplementing household incomes, boosting consumption, and supporting local economies. Policymakers should continue leveraging remittance inflows by fostering financial inclusion and investing in productive sectors to sustain long-term growth. Finally, the study demonstrates a positive and statistically significant relationship between inflation and GDP, suggesting that moderate inflation may signal healthy economic activity. However, this relationship calls for a balanced approach to monetary policy to ensure inflation remains within manageable levels, avoiding adverse effects on purchasing power and economic stability. In conclusion, unemployment, FDI, remittances, and inflation significantly impact GDP in Southeast and Eastern European countries. Policymakers should focus on integrated strategies to reduce unemployment, attract foreign investments, optimize

remittance use, and maintain price stability to ensure sustainable economic growth in the region. Future research in this area could extend the sample to include a more detailed country-level analysis, offering deeper insights into the unique economic challenges and opportunities faced by individual nations in Southeast and Eastern Europe.

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