İstanbul Üniversitesi Sosyoloji Dergisi 43(2): 259-274

DOI: https://doi.org/10.26650/SJ.2023.43.2.0043-1
http://iusd.istanbul.edu.tr

İstanbul Üniversitesi Sosyoloji Dergisi

Submitted: 17 August 2023
Revision Requested: 29 September 2023
Last Revision Received: 13 October 2023
Accepted: 18 October 2023
Online Published: 27 October 2023

RESEARCH ARTICLE

Military Spending and Employment in Eastern European Countries: New Evidence from Panel Data Analysis

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Abstract
This study used the Keynesian theory of employment to discover the relationship between military expenditure and employment in Eastern European countries (Czechia, Estonia, Latvia, Slovenia, Hungary, Slovakia, and Poland) during the post-communist period. To ensure robust estimates, we considered other economic indicators such as gross domestic product, wages, investments, and government expenditure. To fulfill the main purpose of our research, we used several types of panel autoregressive distributed lag (ARDL) techniques, as well as the panel cointegration and panel Granger-causality tests. The results suggested that there is a cointegrating relationship between employment and other explanatory variables. We found a Granger causality from the explanatory variables of interest (military expenditure, gross domestic product, wage, investment, and government expenditure) to employment. Panel ARDL results suggested that an increase in military expenditure results in an immediate increase in employment, but over a longer period of time the opposite is true. Additionally, over time the gross domestic product and investments had a positive effect on employment, whereas wages and government expenditure harmed employment. Our findings provide useful insights into understanding the employment dynamics of Eastern European countries during the post-Cold War period and present valuable policy implications.

Anahtar Kelimeler: Employment • Panel ARDL model • Military expenditures • Eastern European countries • Cointegration • Causality
JEL Classification: E12, E22, E24, P24

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To cite this article: Sağın, A., & Kocaarslan, B. (2023). Military spending and employment in Eastern European countries: New evidence from panel data analysis. *İstanbul Üniversitesi Sosyoloji Dergisi, 43,* 259-274. https://doi.org/10.26650/SJ.2023.43.2.0043-1

Russia's invasion of Ukraine in 2022increased security concerns, especially in European countries. Many international security discussions are currently focused on concerns over Russian aggression and expansionism. The political ramifications caused by the invasion polarized countries in matters relating to the war. This caused heightened instability all over the world, making it more challenging for countries to collaborate and tackle shared issues. In particular, the invasion of Ukraine caused tensions to rise again between Russia and neighboring countries. The perceived Russian threat to the region has prompted Eastern European countries to adopt new policies on defense expenditures. To prevent aggression from Russia, many nearby nations have raised their defense expenditure and implemented measures to enhance their defense capabilities. NATO has also responded by increasing its presence in Eastern Europe, including the deployment of additional troops and resources. The war on Ukraine has resulted in significant economic consequences, disrupting investment and trade mechanisms, leading to widespread difficulties for many people across the globe. Therefore, it is likely to see economic repercussions of this disruption such as changes in unemployment rates in Eastern Europe countries. Considering these recent developments in Eastern European countries, we investigated how military spending affects employment in these countries, as knowledge on this effect enables policymakers in Eastern European countries to implement informed, sound economic and defense policies.

The rate of employment is an important macroeconomic indicator for economies. There are different views in the economics literature on how to increase the employment rate. Classical economic theory claims that employment rates depend on real wages (Barro 1997; Dornbusch et al., 2011). According to this theory, the point where the labor supply and demand functions intersect indicates the equilibrium point in the labor market. The equilibrium point indicates the equilibrium wage level and full employment equilibrium in the economy. The equilibrium point is expressed as the point where the marginal productivity and marginal cost of labor are equal. Unemployment is defined as the unwillingness of workers to work at the equilibrium wage level in the labor market (Eltis 2000). Classical economists state that, with the help of a flexible wage mechanism, there is a possibility of frictional unemployment, and that this type of unemployment will disappear over time; that is, economies always move towards full employment. However, Keynes did not agree with this explanation. He argued that, since workers take nominal wages into account, they will continue to work in an environment where nominal wages do not change, but real wages fall due to the increase in the general level of prices. Therefore, according to Keynes, for a worker to become unemployed voluntarily, they must refuse to work because prices are rising and, thus, real wages are falling. The worker's opposition to a reduction in monetary wages should not be seen as a reason that prevents employment growth (Kurihara, 1959). This is because, according to Keynes, it is often not possible to

reduce real wages by reducing monetary wages. Keynes argued that a fall in the monetary wage and general level of prices could have a positive effect on employment only in extraordinary circumstances (Keynes, 1937; Romer, 2012).

In the Keynesian model, labor demand and employment depend on the effective demand that emerges according to the expectations formed in real markets and the changes in these expectations. In other words, Keynes stated that unemployment in economies arise due to insufficient effective demand (Pigou, 1936). According to Keynes, the level of activity in economies is determined by aggregate demand and aggregate supply. This level of activity does not have to be realized at the point of full employment; rather, according to Keynes, economies are in equilibrium at the point of underemployment. To bring economies to the full employment equilibrium point, aggregate demand should be supported by implemented policies. Expansionary fiscal policies implemented by governments will increase aggregate demand and support economic growth and employment (Keynes, 1937). Therefore, in Keynesian thought, an increase in public expenditures is expected to have positive effects on employment.

Eastern European nations have notable disparities in industrial relations, jobs, and labor when compared to other countries in Europe (Delteil & Kirov, 2016). There has been no rigorous research examining the factors influencing employment dynamics for Eastern European countries such as Czechia, Estonia, Latvia, Slovenia, Hungary, Slovakia, and Poland. In this study, we examined the effects of military expenditures, a type of public expenditure, on employment in these countries' economies during the post-communist period, while considering other economic indicators such as gross domestic product (GDP), wage, investment, and government expenditure, using the Keynesian theory of employment. Our research differs from existing studies in many ways. Firstly, there is a lack of thorough research on the link between military expenditure and employment in Eastern European countries during the post-communist era. To address this issue, this study investigated the relationship between the variables of interest in Eastern European economies using panel data. Secondly, panel data allowed us to capture both individual and collective characteristics, which was more advantageous than using cross-sectional or time series data. Furthermore, panel data reduced the chance of incorrect estimations that could occur when relying on a single time series. Thirdly, we utilized panel cointegration methods, several types of panel autoregressive distributed lag techniques, and the panel Granger-causality test for robust results.

The remaining sections of this study are organized as follows. In Section two we examined theoretical arguments regarding the effect of military expenditures on employment. Section three provides a concise overview of existing empirical research in the area. Section four outlines the data characteristics. Section five delves into the

empirical procedures and presents the empirical outcomes. Section 6 examines the implications of the baseline results and concludes the study.

Theoretical Framework

The study of the effects of military expenditures on employment began with Benoit's (1978) study on the role of these expenditures in economic growth. Since then, an area of literature on this topic emerged, expressing different views regarding the impact of military expenditures on employment. The first argument is that military expenditures increase productivity. Accordingly, military technology developed through defense expenditures is also used in civilian production areas, increasing the productivity of firms (Tang et al., 2009). Additionally, technology-based production in civilian production areas can lead to a decrease in prices and an increase in demand as it reduces costs. Based on this economic mechanism, firms create more employment opportunities to meet the increasing demand, thus decreasing the unemployment rate in economies (Piva & Vivarelli, 2017).

The view that analyses military expenditures with a Keynesian approach considers these expenditures as a type of public expenditure. According to the Keynesian view, all types of public expenditures in economies stimulate demand through effective demand. In this way, increased demand and expenditures lead to an increase in production in economies, allowing firms to employ more people (Huang & Kao, 2005; Smith, 1978; Smith & Georgiou, 1983). In our study, we examined the effects of military expenditures on employment within the Keynesian framework. We used the Keynesian approach to analyze data in the post-Cold War period (2000-2021) for Czechia, Estonia, Latvia, Poland, Slovenia, Hungary, and Slovakia. With the Keynesian approach, we expected that increased military expenditure will show increased employment.

Empirical Evidence

There was not an extensive body of empirical literature on the effects of military expenditures on employment. In the related literature, most studies focused on the link between military expenditures and economic growth. Research analyzing the effects of military expenditures on employment found varying results. In this section, we present different empirical findings from the previous literature regarding the relationship between military expenditures and employment.

Szymanski (1973) evaluated the effects of military expenditures on employment and growth within the framework of Baran and Sweezy's (1966) analysis and demonstrated that military expenditures were effective on employment. Using data from different countries, Smith (1977) concluded that military expenditures were

positively associated with unemployment. Barker, Dunne, and Smith (1991) conducted a similar study for the UK and showed that unemployment decreased with the reduction in military expenditures. Wing (1991) conducted an analysis for Indonesia and found that military expenditures increased employment. Additionally, Payne and Ross (1992) studied the link between the variables of military spending and employment growth and pointed out that there was no causal relationship between the two variables. Hooker and Knetter (1997), however, demonstrated that there was a nonlinear connection between military procurement spending and employment growth in their research using U.S. data.

Subsequent studies broadened the discussion on the relationship between military spending and employment, using data from countries with distinct characteristics. Dunne and Watson (2000) documented a negative relationship between military spending and manufacturing employment overall in South Africa. Huang and Kao (2005) discovered a positive impact of military spending on employment over time, but not in the short run, in a study on Taiwan. Using global panel data, Tang et al. (2009) revealed a Granger causality from military spending to unemployment. There were also several studies indicating that military expenditures negatively affected employment in some countries, such as Turkey, France, and China (Malizard, 2014; Qiong & Junhua, 2015; Yildirim & Sezgin, 2003).

Data

In this research, we considered the dynamic link between military spending and employment in Eastern European countries (Czechia, Estonia, Latvia, Slovenia, Hungary, Slovakia, and Poland) during the post-communist period. The countries were selected based on available data. We evaluated military expenditure per capita (MILEX) as a proxy for military spending, with data collected from the Stockholm International Peace Research Institute (SIPRI) military expenditure database. Employment (EMP) data was obtained from the OECD (Organization for Economic Co-operation and Development) database. To ensure robust estimates, we included some economic indicators as control factors in our model. The first one we considered was gross domestic product (GDP) per capita so that the relationship between unemployment and economic growth based on Okun's Law could be examined. According to the classical theory of unemployment, there is a negative relationship between wages and employment, and if real wages increase beyond what is offered in the market, there will be a decrease in the number of employed people, and more people searching for jobs. Taking this argument into account, we should also take into consideration the average wages (WAGE) as there is a close connection between wages and employment dynamics. Conventional wisdom states that investing is a highly effective way to stimulate economic growth and create more jobs. Therefore, we take the gross fixed

capital formation, also called "investment" as another macroeconomic figure since investment (INV) could be a potential factor influencing the fluctuations in employment. Additionally, we included government expenditure (as a percentage of the GDP) in our investigation to assess the impact of government expenditure (GOVEX) on employment. Data on all control variables (GDP, WAGE, INV, and GOVEX) were sourced from the OECD database. We used yearly data ranging from 2000 to 2021 for our examination. The chosen period was determined by the availability of data for all countries.

We used the logarithms of the variables in the analysis to avoid any potential heteroscedasticity. LEMP, LGDP, LWAGE, LINV, LGOVEX, and LMILEX refer to the logarithms of EMP, GDP, WAGE, INV, GOVEX, and MILEX, respectively. Table 1 reports the descriptive statistics of all variables used in our investigation. The statistics indicate that LINV and LMILEX display the highest volatility and LGDP, LINV, and LMILEX were not normally distributed.

Table 1
Summary Statistics of Variables

	LEMP	LGDP	LWAGE	LINV	LGOVEX	LMILEX
Mean	4.1439	10.0439	10.0759	10.2872	3.7591	5.272347
Median	4.1526	10.1077	10.0543	10.3187	3.7682	5.337014
Maximum	4.3241	10.6964	10.6895	12.4026	4.0993	6.357096
Minimum	3.8754	8.9921	9.3903	8.1639	3.5086	3.379582
Std. Dev.	0.0995	0.3839	0.2756	1.0803	0.1135	0.52022
Skewness	-0.2674	-0.5574	-0.1043	0.2029	-0.1651	-0.69186
Kurtosis	2.4679	2.6178	2.9867	1.9404	2.6654	3.787347
Jarque-Bera	3.6524	8.9102	0.2801	8.2609	1.4179	16.26367
Probability	0.161025	0.011619	0.869319	0.016075	0.49215	0.000294

Note. EMP, GDP, WAGE, INV, GOVEX, and MILEX represent employment, gross domestic product, wage, investment, government expenditure, and military expenditure, respectively. LEMP, LGDP, LWAGE, LINV, LGOVEX, and LMILEX refer to the logarithms of EMP, GDP, WAGE, INV, GOVEX, and MILEX, respectively.

Empirical Procedures and Findings

Unit Root Tests

Pesaran (2006) and Breitung and Pesaran (2008) argued that panel unit root tests were more powerful than those based on single time series, which was why we conducted various panel unit root tests to assess the stationarity properties of variables. We used Im et al.'s (2003) test (IPS), Levin et al.'s (2002) test (LLC), and Fisher-type tests that incorporated ADF and PP tests (Choi, 2001; Maddala & Wu, 1999). The

results of the unit root test are given in Table 2 which show that some of the series are stationary at the first difference I(1) and others at the level I(0). When the first differences of all series are taken, they become stationary, thus allowing us to proceed with our analysis using cointegration tests and the panel ARDL techniques.

Table 2
Panel Unit Root Test Results

	Level	P value	First difference	P value
LEMP				
Levin, Lin & Chu t*	0.3436	0.6344	-4.1365	0.0000
Im, Pesaran and Shin W-stat	1.4816	0.9308	-3.5451	0.0002
ADF - Fisher Chi-square	7.8604	0.8965	37.7431	0.0006
PP - Fisher Chi-square	4.7699	0.9888	34.2837	0.0019
LGDP				
Levin, Lin & Chu t*	-2.9791	0.0014	-5.3827	0.0000
Im, Pesaran and Shin W-stat	0.3835	0.6493	-4.1370	0.0000
ADF - Fisher Chi-square	10.2034	0.7472	42.9487	0.0001
PP - Fisher Chi-square	18.9950	0.1651	59.7009	0.0000
LWAGE				
Levin, Lin & Chu t*	-1.0300	0.1515	-2.1649	0.0152
Im, Pesaran and Shin W-stat	1.7757	0.9621	-2.1163	0.0172
ADF - Fisher Chi-square	5.4260	0.9790	24.0423	0.0453
PP - Fisher Chi-square	7.5364	0.9121	39.1225	0.0003
LINV				
Levin, Lin & Chu t*	-0.7830	0.2168	-8.0014	0.0000
Im, Pesaran and Shin W-stat	0.7944	0.7865	-6.2205	0.0000
ADF - Fisher Chi-square	9.5977	0.7910	63.5839	0.0000
PP - Fisher Chi-square	13.3143	0.5019	61.1675	0.0000
LGOVEX				
Levin, Lin & Chu t*	-0.8156	0.2074	-5.4553	0.0000
Im, Pesaran and Shin W-stat	-2.0729	0.0191	-5.2162	0.0000
ADF - Fisher Chi-square	23.3559	0.0547	53.0669	0.0000
PP - Fisher Chi-square	32.3610	0.0036	110.1180	0.0000
LMILEX				
Levin, Lin & Chu t*	-2.8027	0.0025	-3.4787	0.0003
Im, Pesaran and Shin W-stat	-1.2945	0.0977	-2.9375	0.0017
ADF - Fisher Chi-square	17.5829	0.2264	32.9168	0.0030
PP - Fisher Chi-square	35.9010	0.0011	38.4751	0.0004

Note. EMP, GDP, WAGE, INV, GOVEX, and MILEX represent employment, gross domestic product, wage, investment, government expenditure, and military expenditure, respectively. LEMP, LGDP, LWAGE, LINV, LGOVEX, and LMILEX refer to the logarithms of EMP, GDP, WAGE, INV, GOVEX, and MILEX, respectively.

Panel Cointegration Tests

This research used two methods to check for cointegration among the variables of interest. The findings, shown in Table 3, revealed that Kao's (1999) cointegration test established the existence of a cointegrating link between the variables. Johansen's (1995) error correction panel cointegration test also confirmed the strong cointegrating connection between them. The outcomes of the cointegration tests indicate that employment for countries in Eastern Europe are connected to the gross domestic product, wages, investment, government expenditure, and military spending on a long-term basis. Thus, there is a strong long-run equilibrium relationship between employment and the related variables in Eastern European countries examined during the post-communist era.

Table 3
Panel Cointegration Test Results

Kao Test				
	t-Statistic	**Prob.**		
ADF	-3.0253	0.0012		
Johansen Fisher panel cointegration test				
Hypothesized	**Fisher Stat.***		**Fisher Stat.***	
No. of CE(s)	**(from trace test)**	**Prob.**	**(from max-eigen test)**	**Prob.**
None	418.5000	0.0000	215.8000	0.0000
At most 1	251.1000	0.0000	143.6000	0.0000
At most 2	141.2000	0.0000	77.2200	0.0000
At most 3	78.2200	0.0000	45.6000	0.0000
At most 4	49.4200	0.0000	35.0200	0.0015
At most 5	41.6100	0.0001	41.6100	0.0001

Panel ARDL Tests

No matter what kinds of regressors are present (I(1), I(0), or a combination of both), the autoregressive distributed lag (ARDL) method presented by Pesaran and Shin (1998) is a reliable tool to make macro panel data applicable. We used the ARDL model developed by Pesaran and Smith (1995) to explore the long-run equilibrium relationship between the variables empirically. The following is the ARDL model used as a reference:

$$y_{it} = \phi_i + \sum_{l=1}^{p} \theta_0 \, y_{i,t-l} + \sum_{l=0}^{p} \theta_1 \, x_{i,t-l} + \varepsilon_{it} \qquad (1)$$

The equation above can be rearranged in terms of the parameters below:

$$\Delta y_{it} = \phi_i + \alpha_i\left(y_{i,t-1} - \beta_i x_{i,t-l}\right) + \sum_{l=1}^{p-1} \delta_{il}\, \Delta y_{i,t-l} + \sum_{l=0}^{q-1} \omega_{il}\, \Delta X_{i,t-l} + \varepsilon_{it} \quad (2)$$

We can express the above statement as follows: *t* and *i* stand for time and country, respectively, *y* refers to employment and X is a group of factors, including the gross domestic product, wages, investments, government expenditure, and military spending. Notation δ and ω are short-term coefficients of the lagged dependent variable and independent variables, respectively. β is the long-term coefficient of the independent variables. Lastly, α and ε represent the speed of adjustment and error term, respectively.

This study assessed the long-term connection between employment, gross domestic product, wages, investments, government expenditure, and military spending using the mean group (MG), pooled mean group (PMG), and dynamic fixed effect (DFE) estimators (Pesaran & Smith, 1995; Pesaran et al., 1999). The MG method considers the heterogeneity in short- and long-run connections and is suitable for a large number of countries; however, it is susceptible to outliers and minor alterations in the case of a smaller group of countries (Favara, 2003). The PMG estimator is used as it provides flexibility in the short term and allows for uniformity in the long-term parameters for different countries. This approach considers the diversity of country-specific responses, such as varying reactions to stabilization policies, economic crises, or outside influences in the short term. The PMG is also resistant to lag order selection and outliers. Lastly, we utilized the DFE estimator, which assumes that all countries have the same short-term and long-term responses.

Table four displays the links between employment, gross domestic product, wages, investments, government expenditure, and military spending in the short and long term, according to the results of the MG-ARDL, PMG-ARDL, and DFE model tests. The estimates of the error correction term (ECTs) is found to be between 0 and -1, implying that the systems are returning to equilibrium and the ARDL models are trustworthy. The Hausman Test (Hausman, 1978), a diagnostic test that evaluates the accuracy and proficiency of the estimators, is also used. We compared the efficacy of the estimators to each other based on the Hausman test findings. The findings of the Hausman test suggested that the DFE model was more effective and robust than the MG and PMG approaches. Thus, we only interpreted the DFE model estimates.

We used the Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC) to identify the most suitable lag length for the models, in line with the research of Pesaran and Shin (1998). The same lag length was determined according to both criteria. Our conclusions regarding the dynamic links between the variables of interest are the same. The baseline results suggested a positive effect of gross domestic product and investment on employment in the long term, as well as a negative impact of wage

and government expenditure on employment rates overall. Lastly, employment appeared to increase in response to an increase in military spending in the short term, but it responded negatively to rising military spending in the long term.

Table 4
Panel ARDL Estimation Results

Variable	MG	PMG	DFE
Long-run estimates			
LGDP	0.0016	0.5635***	0.3623***
LWAGE	0.3977**	-0.2169**	-0.3126***
LINV	0.0477	0.0353	0.1180**
LGOVEX	-0.7598*	-0.4604***	-0.2513**
LMILEX	0.0402	-0.1720***	-0.0458*
Short-run estimates			
ECT	-0.5063***	-0.2067***	-0.2696***
D(LGDP)	-0.0077	0.0584	0.0289
D(LWAGE)	-0.0025	0.0744	0.0479
D(LINV)	-0.0084	0.0305	0.0196
D(LGOVEX)	0.0470	0.0413	-0.0027
D(LMILEX)	0.0294**	0.0368***	0.0582***
C	1.1466	0.6104***	0.9756***
Hausman		11.68 (p-value=0.0394)	0.00 (p-value=1.0000)

Note. EMP, GDP, WAGE, INV, GOVEX, and MILEX represent employment, gross domestic product, wage, investment, government expenditure, and military expenditure, respectively. LEMP, LGDP, LWAGE, LINV, LGOVEX, and LMILEX refer to the logarithms of EMP, GDP, WAGE, INV, GOVEX, and MILEX, respectively. ECT represents the error correction term. MG, PMG, and DFE represent the mean group (MG), pooled mean group (PMG), and dynamic fixed effect (DFE) estimators. D represents the first-difference operator. Hausman refers to the Hausman test results. *** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

Panel Granger-Causality Tests

To ensure accuracy, we used a panel data-specific causality test, known as a "stacked test". This approach combines data from all panel units (countries) into one large dataset, assuming that the parameters are the same across all units, meaning that the coefficients are all the same. The model treats panel data as one large set and then the Granger Causality test can be conducted in a regular way, taking into account that the coefficients are the same for each cross-section. The maximum number of lags was limited to five. Table five shows that the results from the causality test are consistent with the long-term estimates of the DFE model, with all variables found to Granger cause employment. In the following section, we review the economic and policy implications of our analysis in detail.

Table 5
Panel Granger-Causality Test Results

Panel A. Causality from LGDP to LEMP		
Stacked test		
Lag	**F-Statistic**	**Prob.**
1	3.00225	0.0853
2	5.24533	0.0064
3	11.186	0.0000
4	8.32307	0.0000
5	6.41859	0.0000
Panel B. Causality from LWAGE to LEMP		
Stacked test		
Lag	**F-Statistic**	**Prob.**
1	1.18356	0.2784
2	0.05025	0.951
3	19.2279	0.0000
4	12.4069	0.0000
5	13.7122	0.0000
Panel C. Causality from LINV to LEMP		
Stacked test		
Lag	**F-Statistic**	**Prob.**
1	0.00042	0.9838
2	6.433	0.0021
3	8.04049	0.0000
4	4.76597	0.0013
5	3.70765	0.0039
Panel D. Causality from LGOVEX to LEMP		
Stacked test		
Lag	**F-Statistic**	**Prob.**
1	2.68159	0.1037
2	5.45356	0.0053
3	3.19438	0.0259
4	2.1927	0.074
5	2.71561	0.0237
Panel E. Causality from LMILEX to LEMP		
Stacked test		
Lag	**F-Statistic**	**Prob.**
1	5.01229	0.0267
2	4.09225	0.0188
3	6.70511	0.0003
4	5.02243	0.0009
5	4.46862	0.001

Note. EMP, GDP, WAGE, INV, GOVEX, and MILEX represent the employment, gross domestic product, wage, investment, government expenditure, and military expenditure, respectively. LEMP, LGDP, LWAGE, LINV, LGOVEX, and LMILEX refer to the logarithms of EMP, GDP, WAGE, INV, GOVEX, and MILEX, respectively.

Discussion and Conclusion

Both low and high levels of employment have significant impacts on the health and well-being of large segments of the population. Additionally, employment has significant negative effects on the environment. Public policies, including employment, must prioritize the assurance of socio-economic reproduction for the maintenance of human life, health, and survival, over maximizing output, and employment without considering genuine individual and social needs. Achieving genuine full employment is an enduring goal and remains a significant challenge for both developed and developing nations. The concept of employment is essential in society, given its crucial social and economic implications. It enables individuals to access resources that enhance their well-being and maintain their presence in social environments. This aspect is particularly critical since unemployment can result in psychological and social exhaustion. Working, producing, and earning an income is associated with happiness. Employment is a vital component in preventing poverty. Public policy guidelines must be grounded in social and environmental indicators as well as substantive norms, which are based on minimum requirements and social objectives. While social support and assistance are important for daily needs, a stable income from employment is more effective. Therefore, research in this field should focus on the increasing employment as a crucial factor.

Existing studies pointed to the varying role of military spending in influencing labor market dynamics. These studies concluded that the response of employment to economic dynamics and macroeconomic fluctuations differed depending on the fundamental characteristics of the chosen countries. However, no study has modeled the short- and long-run dynamics between military spending and employment in a panel data analysis framework for Eastern European countries during the post-Cold War period. The use of panel data analyses, which consider both individual and collective characteristics, potentially enables a better understanding of the critical role of military spending in influencing employment dynamics compared to a single time series or cross-section analysis. To more accurately explain the behavior of labor markets in Eastern European countries, we used panel cointegration techniques, different kinds of panel ARDL models, and a panel Granger Causality tests to investigate the impact of military spending on employment rates during the post-communist period, while controlling for other macroeconomic figures, such as gross domestic product, wages, investments, and government expenditure, in this study. Our findings suggest a strong connection between the variables of interest. The implications of these findings are significant and are discussed below.

We reached two important results regarding the effect of military spending on employment. We first observed the positive effect of military expenditure on employment rates in the short term, which is consistent with the Keynesian theory of employment

arguing that any public expenditure, such as military expenditure, positively influences employment through its positive impacts on overall demand and labor market dynamics. But we found that there was a negative impact caused by military expenditure on employment overall. The difference between short- and long-term findings can be explained through different channels, such as the spin-off effect, resource mobilization effect, and the crowding-out effect emphasized by Lee (2022). Our results imply that spin-off and resource mobilization effects dominate the crowding-out effect in the short run in Eastern European countries during the post-communist period. The spinoff effect, also known as the multiplier effect, is a valuable factor in economic growth. This is because a single investment or economic activity (such as military spending) can ripple throughout different sectors, leading to the creation of jobs and income along with an increased demand for goods and services. This indicates that the initial investment (investment in the defense industry) will have a much broader reach than initially thought, resulting in higher employment. As for the impact of the resource mobilization effect, the ability to efficiently utilize the potential of a country's resources (such as resources for the defense industry), is an important factor for economic growth, as it allows for investments and development of new products, services, and infrastructure, leading to new job opportunities, innovation, and competitiveness. Overall, the findings indicate that the crowding-out effect has more influence on employment dynamics than the spin-off and resource mobilization effects. Over time the crowding-out effect can occur when government expenditure, such as military spending, is increased or funds are borrowed to finance it. This is because when the government borrows, it competes with private businesses and individuals for the same funds, which can lead to higher interest rates and less funds available for new investment opportunities. As a result, private investment and spending can be reduced, potentially leading to slower economic growth and, consequently, less employment overall.

As for the impact of other economic indicators on employment, we found that gross domestic product and investment had a positive effect on employment overall. This finding confirms Okun's law, which stated that there was a precise, strong, and positive correlation between the gross domestic product (GDP) and employment. Investments are the beginning of a business cycle. When people invest in a business, it stimulates the entire industry, resulting in higher production levels and, consequently, higher GDP. This process creates more work, thus increasing employment rates. This concept is the basis of Okun's law and is consistent with our results. Additionally, the results suggest a negative impact of wages on employment, which is consistent with the classical theory of unemployment. This theory suggests that when real wages rise beyond what is typically offered in the labor market, the number of people employed will drop, and more people will be looking for work. Classical unemployment is a kind of joblessness caused by too high real wages in the economy. When real wages are too high, businesses cannot hire all the available employees, leading to some of

them being out of a job. Our findings support this economic mechanism. Finally, we observed a negative impact from government expenditure on employment, as in the case of military spending. This can lead to the crowding out effect which is the result of military expenditure.

Our findings provide valuable policy implications for increasing employment rates in Eastern European countries. According to the results, even though military expenditures improve employment rates in the short term, they have significantly detrimental effects on employment dynamics in the long term. A similar mechanism works regarding the impact of government expenditure. The adverse impacts of military and government expenditure can be attributed to the crowding-out effect. Increases in the gross domestic product and investment play a crucial role in increasing employment. Therefore, the overall evaluation suggests that policymakers in Eastern European countries should focus their attention on economic growth supported by private investment to boost employment over the long term, rather than concentrating on government and military spending. To reduce the negative effects of crowding out, governments should keep their spending, including military spending and borrowing to finance them, under control, which could have less impact on interest rate dynamics and not harm private investment. Additionally, public-private partnerships (PPPs) should have a strong role in strategic investments, including investments in the defense industry. Furthermore, alternative financial instruments that do not interfere with the economic mechanism behind private-sector borrowing should be developed to finance government and military expenditures.

The limitation of our paper is that we focused on a chosen set of Eastern European countries based on available data. Further investigations could broaden the discussion on the impact of military spending on employment by using other sets of countries, such as BRICS (Brazil, Russia, India, China, and South Africa) or MENA (Middle East/North Africa) countries (Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, and Yemen). Additionally, using disaggregated military expenditure data could prove beneficial in better explaining the relationship between military spending and employment.

Peer-review: Externally peer-reviewed.
Author Contributions: Conception/Design of study: A.S., B.K.; Data Acquisition: A.S., B.K.; Data Analysis/Interpretation: A.S., B.K.; Drafting Manuscript: A.S., B.K.; Critical Revision of Manuscript: A.S., B.K.; Final Approval and Accountability: A.S., B.K.
Conflict of Interest: The author declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
Grant Support: The author received no financial support for the research, authorship, and/or publication of this article.

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