THE ROLE OF INSTITUTIONS IN DETERMINING MILITARY EXPENDITURE: EVIDENCE FROM EASTERN EUROPE

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Abstract. The *purpose* of the present paper is to analyse the impact of institutional factors on the level of military expenditure of post-socialist countries of Eastern Europe. The dramatic shift in the European security architecture has compelled these nations to substantially increase their defence budgets. Whilst the extant academic literature thoroughly covers traditional determinants such as external threats and economic development, the specific role of the institutional environment is often addressed in simplistic terms. The present study aims to investigate the causal relationship between institutional determinants and the share of national income allocated to defence, thus filling a significant gap in the existing literature. *Methodology.* The analysis is based on a quantitative assessment of a panel dataset covering 19 post-socialist countries from 2002 to 2023. To account for unobserved country-specific characteristics and common time shocks, a two-way fixed effects model was employed. To ensure valid and robust statistical inference, the estimations utilise Driscoll–Kraay standard errors. The *results* of the study showed that different aspects of the institutional environment have opposing effects on defence spending. The study demonstrated a statistically significant positive correlation between controlling corruption and military expenditure. This finding lends weight to the hypothesis that less corrupt states have stronger fiscal capabilities, enabling them to mobilise resources effectively and fund core state functions, including national security. Conversely, the study identified a statistically significant negative correlation between the strength of the rule of law and defence spending. This finding supports the hypothesis that robust legal institutions with inherent checks and balances, as well as greater public oversight, act as a restraint on executive power. This limits the growth of defence budgets in favour of other public priorities. Furthermore, the model confirmed that countries with larger populations tend to allocate a smaller proportion of their GDP to defence. *Practical implications.* The findings suggest that, since different institutional changes produce opposing outcomes, policymakers should adopt a more considered approach. For example, policies aimed at reducing corruption may increase a state's fiscal capacity to fund defence, whereas strengthening the rule of law may introduce accountability mechanisms that limit such spending. *Value / Originality.* The research aims to provide a detailed analysis of the institutional determinants of defence expenditure, offering robust empirical evidence of the dual and contradictory roles played by different institutions in this area.

Keywords: military expenditure, institutional environment, institutions, corruption, rule of law, Eastern Europe, post-socialist countries.

JEL Classification: H56, F52, O17, P26

1. Introduction

Shifts in Europe's security architecture, prompted by Russian aggression against Ukraine in 2014 and 2022, have compelled Eastern European countries to reconsider their economic policies and increase their defence spending. However, merely increasing funding does not guarantee the effective utilisation of resources, as this largely depends on the quality and efficacy of the institutional environment. While the existing academic literature extensively scrutinises traditional determinants of military expenditure, such as external threats and the level of economic development, the

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role of the institutional environment and its impact remain under-explored. In light of the growing security threats in Eastern Europe, analysing the institutional factors influencing its nations' defence spending is highly significant for understanding contemporary international security, both practically and theoretically.

The objective of this study is to analyse the influence of institutions on the level of military expenditure in Eastern European countries. The academic contribution of this work lies in its identification and quantification of the impact of institutional factors on the shaping of defence budgets in the post-socialist nations of Eastern Europe. In order to achieve this aim, the study will provide a theoretical justification for the role of institutions in the formation of public budgets and construct a panel dataset for 19 post-socialist Eastern European countries covering the period from 2002 to 2023. Subsequently, an econometric analysis will be conducted to evaluate the impact of various institutional factors. The findings of this analysis will be interpreted in order to formulate policy recommendations for institutional reform within the defence sector of transition economies.

The conceptual and methodological framework of this study is grounded in the principles of new institutional economics and the field of economic transitology. In order to analyse the institutional determinants of military expenditure, the study employs a quantitative panel data analysis. The primary analytical instrument employed is a two-way fixed-effects regression model. This specification allows for the control of both country-specific, time-invariant characteristics (e.g., geographical location or historical legacy) and region-wide, time-varying shocks (e.g., global economic crises or changes in the security environment). The results of the Hausman test validated the selection of a fixed-effects model over a random-effects specification. To ensure robustness against potential heteroscedasticity and spatial dependence, standard errors were calculated using the Driscoll–Kraay method. All econometric modelling was performed using the Gretl software package.

The article presents a theoretical framework and a literature review analysing how institutional factors can influence defence expenditure. The methodology for the econometric analysis is outlined, including the model specification, variables, and sample characteristics. It presents the results of the econometric analysis, outlines the limitations of the study and proposes avenues for future academic inquiry.

2. Theoretical Background and Literature Review

The transition from a command-and-control to a market-based economy in Eastern European countries has attracted considerable academic interest.

Of particular note is the institutional environment formed during this period of transition and its subsequent influence on economic policy, particularly in relation to the formulation of defence budgets. This analysis is based on the principles of New Institutional Economics, particularly the theoretical contributions of Douglass North. His definition of institutions as human-devised constraints that structure political, economic, and social interactions, and his methodological distinction between institutions ("the rules of the game") and organisations ("the players"), form the basis of contemporary institutional research (North, 1990). The institutional environment can be defined as the totality of the political, social, and legal rules that underpin production, exchange, distribution, and consumption within a society (North, 1990). Formal and informal rules determine how organisations function, and these organisations shape the incentive structure, thereby influencing the efficacy of economic policy.

It is crucial to consider path dependence, as this makes the defence apparatus particularly resistant to change. In states with an inefficient institutional environment, the defence sector becomes a hotspot for rent-seeking, whereby state policy is manipulated to acquire wealth. This makes the sector vulnerable to institutional dysfunction (Grazhevska et al., 2021), where formal rules are replaced by informal ones. This may occur in the defence sector due to a combination of factors, including a high level of secrecy, complex procurement processes and limited competition. However, it is important to note that existing patterns may be altered under conditions of extreme external shocks, such as a full-scale war.

External aggression has become the dominant factor, leading to an unprecedented increase in defence expenditure as a proportion of GDP. The growth in military spending and substantial international aid has reinforced public demand for accountability (Petlenko et al., 2025). This situation underscores the necessity for research into specific mechanisms for ensuring transparency within the defence sector. In the context of a full-scale war and substantial international financial support, it is imperative to enhance oversight of the budgetary process within the defence sector (Lyutiy et al., 2022). Moreover, Russia's full-scale invasion has precipitated a fundamental shift in the perception of defence throughout Europe (Fiott, 2024). The efficacy of transparency is considerably bolstered by the existence of robust accountability mechanisms, such as the rule of law and democratic elections (Chen & Ganapati, 2021).

The direction of corruption's influence on the volume of military expenditure is a subject of active debate in the academic literature. It has been posited that corruption engenders incentives for elites to augment opaque defence budgets for the purpose of

rent-seeking (Ali & Solarin, 2020). Conversely, an argument can be made that corruption has the effect of reducing defence expenditure by undermining the economy as a whole and, consequently, the fiscal capacity of the state. A synthesis of these approaches suggests that the impact of corruption depends on a country's income level: it increases budgets in affluent countries while decreasing them in poorer ones (Arif et al., 2018). This ambiguity highlights the need for further research using more homogeneous samples, such as post-socialist countries.

However, corruption is not the only factor to consider; other institutional factors also play a significant role. For example, the institutional features of democratic regimes influence the level of defence expenditure; presidential democracies tend to spend more than parliamentary ones, which is linked to a greater propensity for conflict and a more prominent military role in political affairs (Bel & Elias-Moreno, 2009). However, this area is not without its complexities, as dominant approaches to security sector reform that focus on the rule of law are often ineffective in post-conflict societies (Donais & Barbak, 2021). Furthermore, the relationship between military expenditure and economic development is still being debated, although recent studies increasingly find evidence of a negative long-term impact (d'Agostino et al., 2017).

Furthermore, any empirical analysis of institutions faces significant methodological challenges, particularly with regard to measurement. There is no academic consensus on which indicators to use to assess institutional quality (Samadi & Alipourian, 2021). The feasibility of empirically testing any hypothesis depends on the ability to accurately measure institutions. This task is extremely complex, as commonly used indicators are often criticised for being subjective and overly aggregated (Voigt, 2013). Furthermore, institutional influence may be non-linear and contingent on the current level of public expenditure, necessitating robust and flexible econometric methods (Barra & Ruggiero, 2023).

Thus, despite a substantial body of research, the academic literature has yet to reach a consensus on the precise manner in which institutions influence military expenditure. Findings on the impact of corruption are contradictory, and the effects of different aspects of governance, particularly in the context of post-socialist transformations, are under-explored.

3. Methodology and Data

A panel data analysis methodology was employed to analyse the institutional factors determining the level of military expenditure in Eastern European countries. This approach allows variations between countries (the cross-sectional dimension) and the dynamics of indicators over time (the time-series dimension) to be analysed simultaneously.

The sample comprises 19 post-socialist countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine. The selection of these countries is methodologically justified by their shared historical legacy: all of them operated under a command-and-control economic system in the early 1990s. This common starting point enables an examination of how their divergent institutional development trajectories have subsequently influenced state policy, particularly within the defence sector. Since 1991, these nations have pursued different paths of institutional reform, ranging from successful integration into the European Union and NATO, to the continued presence of authoritarian practices and ongoing state-building challenges. This divergence, driven by differences in their institutional environments, provides the variation necessary for robust regression analysis.

The research period was determined by data availability and key historical events. By the early 2000s, the initial phase of post-socialist transformation had been completed in most countries in the region. This allowed for the analysis of more stable and well-established institutional and economic systems. The selected period, extending to 2023 inclusive, encompasses the responses of these countries to the Russo-Georgian War of 2008, the annexation of Crimea and the onset of the war in Donbas in 2014 and Russia's full-scale invasion of Ukraine in 2022. The incorporation of these events into the analysis enables the model to assess how institutional differences influenced the capacity and readiness of states to respond to escalating external threats.

In light of the anticipated heterogeneity amongst the selected countries, a two-way fixed-effects model was selected for the analysis, as it offers several distinct advantages. Firstly, it incorporates country-specific fixed effects (α_i), which control for the influence of unique, time-invariant characteristics of each nation, such as geographical location, historical legacy, culture and other unobservable factors. This mitigates the risk of omitted variable bias arising from deep-seated, time-variant differences between the units of analysis.

Secondly, the model incorporates time-fixed effects (γ_t), represented by dummy variables for each year of observation. This facilitates control for region-wide temporal shocks, including the global financial crisis of 2008, shifts in the international security architecture post-2014, the pandemic of 2020 and fluctuations in global energy prices. The model estimates the net effect of the independent variables, having accounted for the influence of both individual country characteristics and common temporal trends.

The general model is specified as follows:

$Y_{it}=\beta_0+\beta_1 X_{1,it}+\beta_2 X_{2,it}+\beta_3 X_{3,it}+\alpha_i+\gamma_t+\epsilon_{it}$

Where Y_{it} is the dependent variable, $X_{k,it}$ represents the independent variables, α_i denotes the country-specific fixed effects, γ_t denotes the time-fixed effects, and ϵ_{it} is the error term.

The selection of a fixed-effects model over a random-effects specification was supported by the Hausman test, which indicated a correlation between the individual effects and the regressors. This finding renders the random-effects model both biased and inconsistent for this particular analysis. In order to obtain robust standard errors, the Driscoll-Kraay estimation method was employed. This approach is especially robust for panel data exhibiting cross-sectional dependence, thereby ensuring the validity of the statistical inferences.

The dependent variable in this study was military expenditure as a percentage of GDP. This is the primary indicator reflecting the priority afforded to the defence sector within a state's fiscal policy. This indicator is intended to measure the proportion of national income that a government deliberately allocates to military requirements. The data were sourced from the Stockholm International Peace Research Institute (SIPRI) database. As illustrated in Figure 1, there has been an aggregate upward trend in military expenditure (mean value) for the sample of 19 Eastern European countries over the period 2002-2023.

The data reveal a downward trend during the first decade of the analysed period, with mean military expenditure as a share of GDP decreasing from over 2% to a historic low of 1.3% in 2013. A marked trend reversal occurred after 2014, following the onset of Russian aggression against Ukraine. Consequently, the downward trend in defence allocations gave way to a period of gradual growth, reaching 1.78% by 2020. A structural break is evident in 2022, after which mean expenditure increased sharply to a peak of 3.77% in 2023.

The independent variables are defined as follows:
– The Control of Corruption Index measures the extent to which public power is perceived to be exercised for private gain (source: the World Bank's Worldwide Governance Indicators (WGI). Higher values correspond to lower perceived levels of corruption. Figure 2 presents a scatter plot illustrating the relationship between mean military expenditure (% of GDP) and the Control of Corruption Index for Eastern European countries in the sample (2002–2023).

A thorough examination of the scatter plot discloses a modestly positive trend, thereby suggesting that nations characterised by elevated levels of corruption control (positioned further to the right on the graph) tend to demonstrate marginally higher levels of military expenditure. Consequently, the research hypothesis posits that low corruption serves as an indicator of high
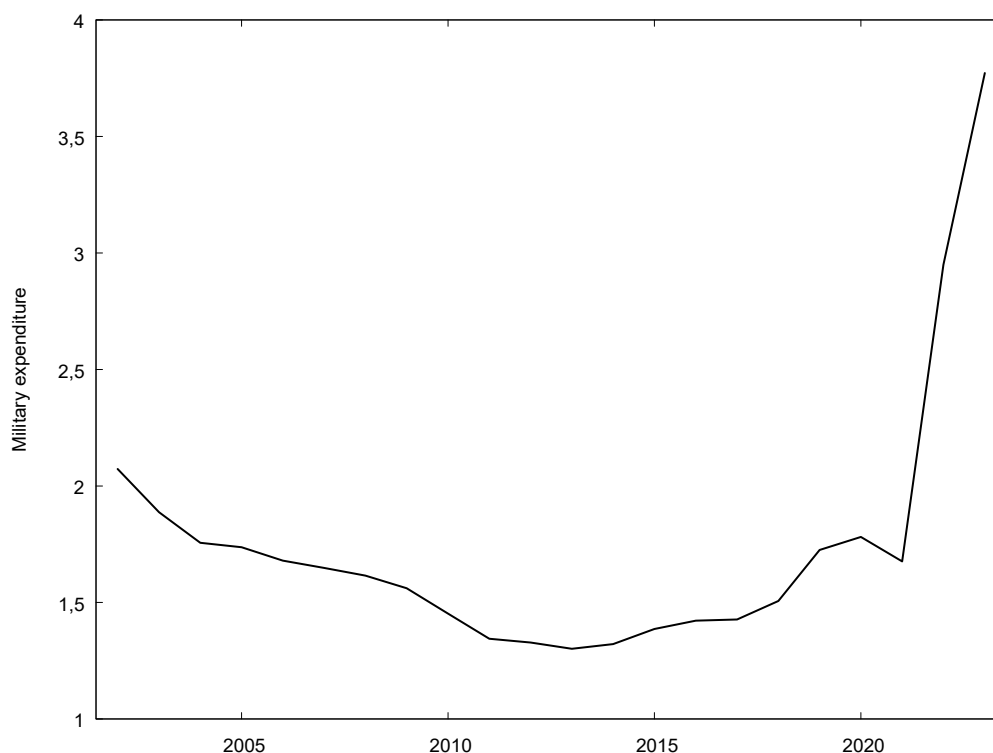

Figure 1. Mean military expenditure in the analysed Eastern European countries, 2002-2023, % of GDP

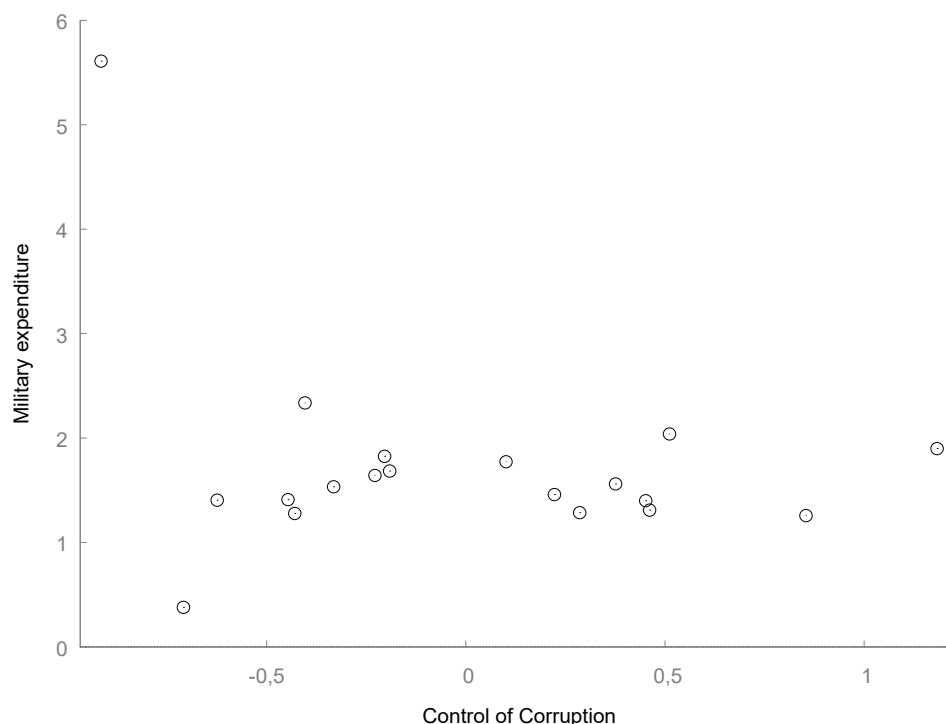*Source: compiled by the authors based on (SIPRI, 2024)*

Figure 2. Mean military expenditure and the Control of Corruption Index in Eastern European countries

Source: compiled by the authors based on (SIPRI, 2024; World Bank Data, 2025)

state capacity, which in turn enables a more effective mobilisation of resources to fulfil core state functions, including national defence.

The Rule of Law Index is a variable that measures the quality of contract enforcement, the police and the courts, as well as the likelihood of crime and violence (source: WGI). Higher values are indicative of a more robust rule of law. Figure 3 presents a scatter plot that illustrates the relationship between mean military expenditure (% of GDP) and the Rule of Law index for the Eastern European countries in the sample (2002-2023).

The scatter plot analysis reveals a negative relationship between the two variables. Countries that have a higher Rule of Law Index (positioned further to the right on the graph) tend to allocate a smaller share of their GDP to defence spending on average. Consequently, a subsequent research hypothesis is that these institutions function as a mechanism for accountability and a constraint on executive power, thereby reinforcing public and parliamentary oversight of the budgetary process.

Population (total) is a control variable reflecting the scale of the country, sourced from World Bank data. This variable will be used to test the scale-effect hypothesis, which suggests that larger countries can achieve the same level of security while spending a smaller proportion of their GDP.

4. Modelling Results

The analysis covers a sample of 19 Eastern European countries and comprises 415 observations. The dependent variable is the share of military expenditure in GDP. The time series for each country ranges in length from 19 to 22 years. Robust estimates that account for heteroscedasticity, autocorrelation and spatial dependence were obtained using Driscoll-Kraay standard errors with a bandwidth parameter of 2. The analysis indicates that all the variables included in the model have a statistically significant impact on the level of military expenditure at the 5% confidence level or better. Diagnostic tests confirmed the presence of heteroscedasticity (modified Wald test), autocorrelation, and spatial dependence (Pesaran's CD test: $z = 2.24$, $p < 0.05$).

The estimation results for the model are presented in Table 1.

The main finding of this study is the identification of the complex, multidirectional role played by institutions in the formation of defence budgets. Firstly, the modelling results revealed a statistically significant positive relationship between the Control of Corruption Index and military expenditure. This variable demonstrates a strong positive relationship with the dependent variable ($p < 0.001$). The coefficient shows that, all other things being equal, a one-point improvement in the Control of Corruption Index is
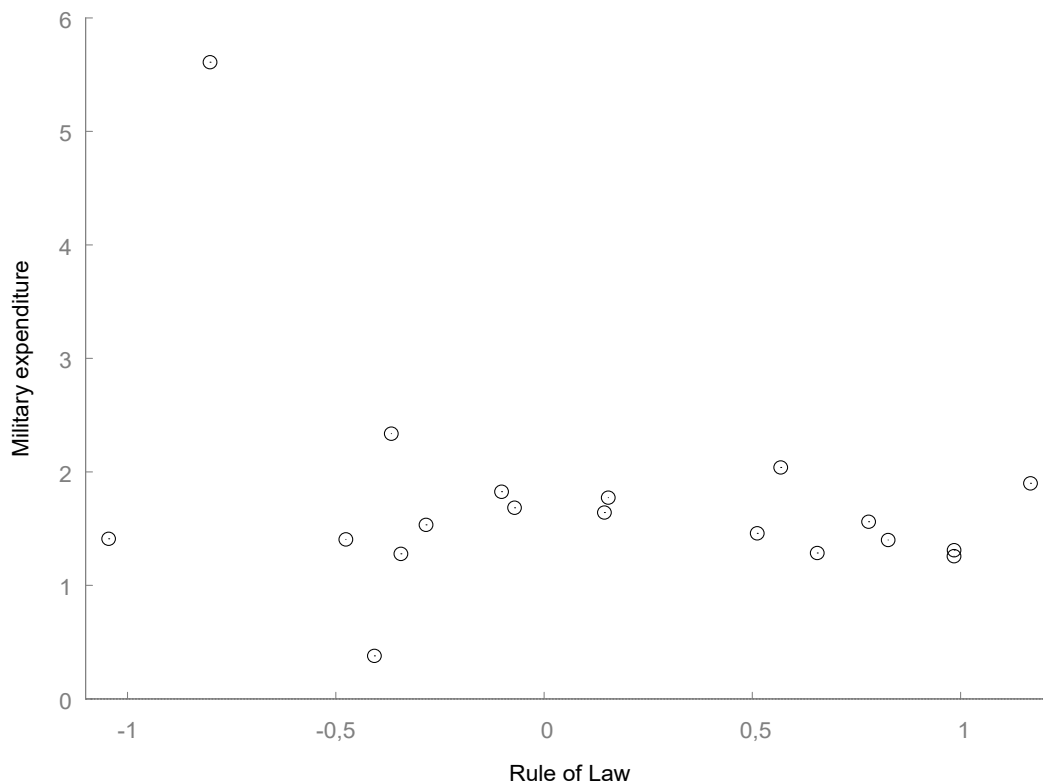
Figure 3. Mean military expenditure and the Rule of Law Index in Eastern European countries

Source: compiled by the authors based on (SIPRI, 2024; World Bank Data, 2025)

associated with an average increase of 1,915 percentage points in the share of military expenditure in GDP. This corroborates the hypothesis that low corruption indicates high state capacity, enabling more effective mobilisation of resources for national security. This finding supports the idea that effective control over corruption is a sign of a robust state that can mobilise and reallocate resources in favour of national security. This finding challenges the simplistic thesis that corruption invariably leads to inflated budgets. Instead, it suggests that corruption is more likely to undermine the state's fundamental capacity to finance its core functions.

Secondly, the modelling shows that there is a statistically significant negative relationship between the Rule of Law Index and military expenditure. This variable is also significant ($p < 0.001$), with a coefficient showing that an improvement of one point in the Rule of Law Index is, on average, associated with a decrease of 1.67 percentage points in the proportion of military expenditure to GDP. This finding lends further support to the hypothesis that the rule of law functions as a mechanism of accountability, thereby constraining the government's capacity to increase defence budgets. This finding, which at first glance appears to be in direct opposition to the commonly held view, lends further support to the hypothesis that the establishment of a robust rule of law serves to establish a system of checks and balances, thereby rendering it more difficult for

the executive to increase defence allocations without proper justification and public support. Indeed, such increases are often redirected towards social needs.

Consequently, these findings collectively confirm that while combating corruption expands a state's fiscal capacity, the rule of law establishes the mechanisms by which the use of this capacity is controlled.

Concurrently, the model confirmed the presence of a scale effect, as evidenced by the negative and statistically significant ($p < 0.01$) coefficient for the Population variable. This finding suggests that for every increase of one million people in the population, the proportion of GDP allocated to defence decreases, on average, by 2.79 percentage points. This suggests that more populous countries may be able to achieve a desired level of defence capability whilst spending a proportionally smaller share of their national income.

5. Conclusions

The objective of the present study was to ascertain the nature of the influence of institutional factors on military expenditure in 19 post-socialist Eastern European countries over the period 2002-2023. Utilising a two-way fixed-effects panel regression model with robust standard errors, the study identified evidence that the institutional environment assumes an ambiguous role in the shaping of defence budgets.

Table 1

Regression results for the determinants of military expenditure

	Coefficient	Std. error	t-statistic	p-value
const	29,8526	6,80153	4,389	0,0003
Population	−2,79215e-06	6,85340e-07	−4,074	0,0005
Rule of Law	−1,67143	0,414124	−4,036	0,0006
Control of Corruption	1,91550	0,355538	5,388	<0,0001
dt_2003	−0,508942	0,0655843	−7,760	<0,0001
dt_2004	−0,641693	0,0818322	−7,842	<0,0001
dt_2005	−0,941976	0,140079	−6,725	<0,0001
dt_2006	−1,08303	0,163838	−6,610	<0,0001
dt_2007	−1,11070	0,179141	−6,200	<0,0001
dt_2008	−1,20117	0,205688	−5,840	<0,0001
dt_2009	−1,28356	0,221919	−5,784	<0,0001
dt_2010	−1,49104	0,246947	−6,038	<0,0001
dt_2011	−1,65791	0,265884	−6,235	<0,0001
dt_2012	−1,71381	0,279999	−6,121	<0,0001
dt_2013	−1,80977	0,299085	−6,051	<0,0001
dt_2014	−1,86512	0,328446	−5,679	<0,0001
dt_2015	−1,93926	0,346758	−5,593	<0,0001
dt_2016	−2,00734	0,372413	−5,390	<0,0001
dt_2017	−2,09998	0,394114	−5,328	<0,0001
dt_2018	−2,12044	0,417166	−5,083	<0,0001
dt_2019	−2,02257	0,445925	−4,536	0,0002
dt_2020	−2,19441	0,493826	−4,444	0,0002
dt_2021	−2,47211	0,546770	−4,521	0,0002
dt_2022	−1,80642	0,687644	−2,627	0,0158
dt_2023	−1,48432	0,814294	−1,823	0,0826

Mean dependent variable	1,742008	S.D. dependent variable	2,189752
Sum squared residuals	433,7434	S.E. of regression	1,079804
LSDV R-squared	0,781504	Within R-squared	0,724601
Log-likelihood	−598,0257	Akaike criterion	1282,051
Schwarz criterion	1455,267	Hannan-Quinn criterion	1350,547
rho	0,703282	Durbin-Watson statistic	0,458533

Source: compiled by the authors

The findings are threefold. Firstly, a robust and statistically significant positive relationship was identified between the level of corruption control and the share of military expenditure in GDP. Secondly, a negative impact of the rule of law on defence allocations was established. Thirdly, the presence of a scale effect was confirmed, whereby more populous countries tend to allocate a proportionally smaller share of their national income to defence.

It is acknowledged that this study has several limitations. Firstly, the analysis relies on aggregated, perception-based indices of institutional factors. Secondly, the findings are specific to Eastern Europe and require further investigation to establish their applicability to other parts of the world.

Future research could use a combination of quantitative and qualitative methods to examine the budgetary decision-making processes in specific countries in more depth. Additionally, analysing how the identified patterns change in response to a sharp increase in external threats would be valuable.

These findings have significant practical implications for the formulation of public policy and international aid programmes. They suggest that policies must consider non-linear effects. For example, successful anti-corruption reforms could increase a state's fiscal capacity to fund defence, whereas strengthening the rule of law could lead to public pressure to reduce such spending. It is crucial to understand this balance between capacity and accountability in order to build resilient and effective institutions.

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