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Unequal Partners? Rethinking Burden Sharing in a Future European Defence Union

DR GEORGIOS PAPAGIANNIS[1]

Abstract

This study examines burden sharing among European Union member states within the hypothetical framework of a European Defence Union (EDU). The analysis is grounded in economic theory of alliances, which conceptualizes collective defense as a public good creating conditions for free-riding behavior. This theoretical lens emphasizes the need for equitable burden sharing to sustain the effectiveness and cohesion of the alliance. A cost-benefit methodology is applied, evaluating each member state's contribution and benefits based on geographic, demographic, economic, trade, and security threat dimensions.

Covering the period from 2014 to 2023 and drawing on reliable, comparable datasets, the findings reveal a persistent asymmetry: 21 of 27 EU member states contribute less than the security and economic benefits they receive, while six—most notably France, Germany, and Italy—bear a disproportionately high share of the collective defense burden. The analysis also considers the impact of Brexit, highlighting the United Kingdom's role as a stabilizing factor in the equilibrium of defense burden distribution. Its withdrawal exacerbated existing disparities, increasing the relative burden on major contributors.

The results underscore the urgent need for compensatory mechanisms, flexible contribution schemes, and differentiated responsibilities to ensure the long-term viability, fairness, and institutional legitimacy of any future European defense arrangement.

Keywords EU; Burden Sharing; Economic Theory of Alliances; Free-Rider Problem

[1] Adjunct Lecturer, Athens University of Economics and Business

Introduction

The notion of fair or balanced burden sharing in defense obligations has gained particular importance in recent years, as political and institutional debates on strengthening the EU's strategic autonomy and forming a unified European defense pillar have re-emerged. Despite increasing demands, the EU does not currently possess a common armed force, while the military defense of its member states remains under national sovereignty. For 23 out of the 27 EU member states, defense is reinforced through their participation in NATO, which provides collective security and military support in the event of an attack. However, this reliance on external defense mechanisms has repeatedly been highlighted as a structural weakness in discussions surrounding European strategic autonomy.

Within this framework, institutional actors and experts argue that the EU must acquire common armed forces to ensure the security of its citizens and the territorial integrity of the Union, without relying on third parties. The strengthening of European defence is considered critical not only for security but also for competitiveness, as emphasized in the Draghi Report.[2] Two main factors have recently driven a renewed focus on reinforcing the EU's role in defense:

- External threats to the EU, such as Russia's war in Ukraine, pose serious risks to the security of European citizens. Conflicts, geopolitical rivalry, increasing militarization, and hybrid threats are placing mounting pressure on global security.[3] Preparing for such shocks is a prerequisite for the preservation of peace.[4]
- Defence is a public good,[5] a domain where EU-level coordination could prove beneficial to all. The net benefits of public spending in defence are greater at

[2] Mario Draghi, 'The future of European competitiveness – Part B: In-depth analysis and recommendations' (2024) *European Commission*.
[3] Elena Lazarou and Branislav Stanicek, 'Mapping threats to peace and democracy worldwide' (2024) *European Parliamentary Research Service*.
[4] Sauli Niinistö, 'Safer together: Strengthening Europe's civilian and military preparedness and readiness' (2024) *European Council*.
[5] Gabriel Felbermayr and Atanas Pekanov, 'Pan-European public goods: Rationale, financing and governance' (2024) *European Commission*; Buti, M., and Papakonstantinou, G., 'European public

the European level than at the national level, owing to the more efficient use of resources and capabilities.

In this context, the President of the European Commission, Ursula von der Leyen, has encapsulated the direction the Union should take in defence policy with the phrase: "spend more, spend better, spend European".[6] Her statement underscores the need to transition from fragmented national approaches to a more coordinated, collective, and strategically focused European defence policy — treating defense not only as a condition for security but also as a shared economic interest. From this perspective, the pursuit of greater efficiency in European defence expenditures represents a first step toward building a functional European Defence Union. At the same time, such an approach may support a strategic shift away from setting quantitative spending targets (e.g., percentage of GDP) toward achieving specific operational capabilities and common assets. This need aligns with alliance theory, according to which defense constitutes a public good from which all members benefit, regardless of their individual contributions. In this light, a collectively coordinated and strategically targeted allocation of resources acts as a counterbalance to the phenomenon of 'free riding' and reinforces the principle of equitable burden sharing among participants.

This study focuses on analyzing how defence burdens are distributed among EU member states. It aims to produce results based on the most recent available data covering the period 2014–2023, concerning all 27 EU member states. The study's novelty lies in the introduction of a new variable for measuring benefits: the level of threat to national security. Under this lens, the research seeks to answer three key questions:

1. Which member states bear a heavier burden — and which bear less — in relation to their contribution to the provision of common defence and security, compared to the benefits they derive from it? In other words, are there states that 'over-contribute', providing more resources than the benefits they receive,

goods: How can we supply more?' (2022) *LEAP Policy Brief*, Luiss School of European Political Economy.

[6] Ursula von der Leyen, 'Europe's choice: Political guidelines for the next European Commission 2024–2029' (2024) *European Commission*.

and conversely, states that 'under-contribute', offering less than their fair share while benefiting from the collective security umbrella?

2. How does the burden distribution among member states shift under the assumption of a collective EU army, when the level of security threat is introduced as a variable for estimating defense benefits?

3. How did the burden-sharing arrangement among EU member states change following the United Kingdom's exit from the Union?

1. Past Studies of Burden Sharing: A Brief Review

In a seminal study for the international academic community, Olson and Zeckhauser[7] argued that NATO allies shared the pure public good of defence, as expressed through the deterrent power of the doctrine of Mutual Assured Destruction. According to this doctrine, any action by the Warsaw Pact against the territorial integrity of NATO's European allies would trigger the rapid launch of nuclear ballistic missiles, causing catastrophic damage to the attacker. The threat embedded in the U.S. nuclear arsenal provided non-rival and non-excludable benefits to all alliance members. The researchers posited that under such a collective deterrence system, overall defense spending among NATO members would be suboptimal, as each state would lack sufficient incentives to invest proportionately in defense. Furthermore, they hypothesized that smaller and poorer allies would disproportionately rely on larger and wealthier allies—especially the U.S., the UK, and France, which possessed strategic nuclear weapons. At the same time, West Germany, despite lacking nuclear capabilities, had strong incentives to protect its eastern borders against potential Soviet aggression, thereby indirectly contributing to the protection of other Western allies. This context led Olson and Zeckhauser[8] to formulate the hypothesis of the 'exploitation of the rich by the poor' within NATO. To test this hypothesis, they used Spearman's rank correlation to measure the relationship between the military expenditure-to-GDP ratio and GDP size for the year 1964. They found a positive and statistically significant

[7] Mancur Olson and Richard Zeckhauser, 'An economic theory of alliances' (1966) *The Review of Economics and Statistics*, Vol. 48 (3), 266–279.
[8] Olson and Zeckhauser (no 7) 270

correlation, confirming their theory that the economically stronger allies bore a disproportionately greater defense burden relative to their economic capacity.

An alternative to the pure public good model is the Joint Product Model (JPM). The foundation of this approach was presented by van Ypersele de Strihou,[9] who noted that some military expenditures may yield private benefits to a particular ally's population while offering little or no benefit to others. For example, Portugal's increased defense spending due to its military involvement in Angola had the characteristics of a private good: it provided substantial benefits to Portugal but negligible benefits to its allies. In this context, Sandler[10] developed the JPM, asserting that defense expenditures can produce pure public benefits for the alliance, private benefits for individual countries, and impure public benefits related to damage limitation for specific members. The latter may arise, for instance, from troop deployments on national borders, which offer greater protection to the deploying country than to distant allies.[11]This model is based on a cost-benefit analysis framework in which member states contribute according to the benefits they receive. To that end, a burden-sharing measure was developed to express each country's share of total military expenditures. To evaluate this balance, Sandler and Forbes[12] created a benefit index that encapsulates the total assets protected by defense spending for each member state. They argued that NATO's defence protected each ally's economic base, population, and exposed borders (and later, territorial size), primarily through deterrence capacity. The economic base was equated with GDP, while the other two factors were directly measurable. Since the actual utility function of each state is unknown, the researchers assigned equal weights to each factor, calculating the average of the three indices as representative of the overall benefit. As geopolitical conditions

[9] Jacques van Ypersele de Strihou, 'Sharing the defence burden among Western allies' (1967) *Review of Economics and Statistics*, Vol. 49, 527–536.
[10] Todd Sandler, 'Impurity of defense: An application to the economics of alliances' (1977) *Kyklos*, Vol. 30(3), 443–460.
[11] Martin McGuire and Carl Groth, 'A method for identifying the public good allocation process within a group' (1985) *Quarterly Journal of Economics*, Vol. 99 (4), 915–934;
Todd Sandler and James C. Murdoch, 'Nash–Cournot or Lindahl behavior? An empirical test for the NATO allies' (1990) *Quarterly Journal of Economics*, Vol. 105 (4), 875–894.
[12] Todd Sandler and John F. Forbes, 'Burden sharing, strategy, and the design of NATO' (1980) *Economic Inquiry*, Vol. 18(3), 425–444.

changed, new indicators emerged to capture the benefits of alliance participation, such as import/export volume[13] and exposure to terrorism.[14]

The NATO doctrine of flexible response enabled the alliance to address Warsaw Pact challenges in a differentiated manner. Under this doctrine, NATO developed strategic, tactical, and conventional forces intended to function in a coordinated and complementary way.[15] The combined use of these three categories of weapons meant that NATO's defense activities produced joint security products. As private or impure public benefits increased, the incentive to free ride declined. This was because, to benefit from the alliance's activities, members needed to express their preferences through active participation and contribution.

Studies examined the exploitation hypothesis within NATO before and after 1967—the year marking the formal adoption of the flexible response doctrine. Sandler and Forbes[16] found a significant correlation only for the years 1960–1966; thereafter, except for 1973, the correlation was not statistically significant. Murdoch and Sandler[17] concluded that NATO's flexible response doctrine reduced the potential for free-rider behavior by inducing complementarity among defense outcomes jointly produced by the allies. Using a different methodological approach, Oneal and Elrod[18] analyzed the share of variance in the military expenditure-to-GDP ratio that could be explained by GDP alone over the 1953–1984 period. Their findings showed that after 1968, the explanatory power of GDP was negligible, aligning with previous studies. Hansen, Murdoch, and Sandler[19] concluded that free riding within NATO was only possible in the domain of strategic nuclear forces provided by the nuclear allies. Khanna and

[13] Christos Kollias, 'A preliminary investigation of the burden sharing aspects of a European Union common defence policy' (2008) *Defence and Peace Economics*, Vol. 19 (4), 253–263.
[14] Todd Sandler and Hirofumi Shimizu, H., 'NATO burden sharing 1999–2010: An altered alliance' (2014) *Foreign Policy Analysis*, Vol. 10 (1), 43–60.
[15] James C. Murdoch and Todd Sandler, 'Complementarity, free riding and the military expenditures of NATO allies' (1984) *Journal of Public Economics*, Vol. 25(1), 83–101.
[16] Todd Sandler and John F. Forbes, 'Burden sharing, strategy, and the design of NATO' (1980) *Economic Inquiry Vol.*18(3),425-444
[17] Murdoch and Sandler (no 15) 94.
[18] John R. Oneal and Mark Elrod, 'NATO burden sharing and the forces of change' (1989) *International Studies Quarterly*, Vol. 33 (4), 435–456.
[19] Laurna Hansen, James C. Murdoch and Todd Sandler, 'On distinguishing the behavior of nuclear and non-nuclear allies in NATO' (1990) *Defence Economics*, Vol. 1(1), 37–56.

Sandler,[20] analyzing the 1960–1992 period, found no significant correlation after 1966. In their follow-up study,[21] they found no statistically significant evidence of systematic under-contribution by NATO member states between the mid-1970s and 1994. Sandler and Murdoch[22] extended the analysis to cover each year of the 1990s and found no evidence to reject the null hypothesis of a match between defense burdens and benefit shares. These findings strengthened the view that NATO defense delivered sufficient private and impure public benefits to limit free-rider behavior through 1999, as allies appeared to bear defense burdens proportionate to their expected gains. Overall, empirical data clearly indicates that following the adoption of flexible response, no systematic exploitation of wealthier allies by poorer ones was observed within NATO.

After the Cold War, NATO's primary threat shifted from the East to new forms of conflict. The alliance responded with crisis management operations in Bosnia and Kosovo, aimed at protecting European interests and preventing conflict spillovers. The concept of "burden" gradually shifted from input-based indicators, such as defense expenditures, to output-based indicators, including military deployments and operational commitments, as well as risk-sharing metrics such as personnel casualties and national restrictions on missions.[23]

[20] Jyoti Khanna and Todd Sandler, 'NATO burden sharing: 1960–1992' (1996) *Defence and Peace Economics*, Vol. 7, 115–133.
[21] Jyoti Khanna and Todd Sandler, 'Conscription, peacekeeping and foreign assistance: NATO burden sharing in the post-Cold War era' (1997) *Defence and Peace Economics*, Vol. 8, 101–121.
[22] Todd Sandler and James C. Murdoch, 'On sharing NATO defence burdens in the 1990s and beyond' (2000) *Fiscal Studies*, Vol. 21 (3), 297–327.
[23] Marion Bogers and Robert Beeres, 'Mission Afghanistan: Who bears the heaviest burden' (2013) *Peace Economics, Peace Science and Public Policy*, Vol. 19 (3), 349–367 ;
Keith Hartley and Todd Sandler, 'NATO burden sharing: Past and future' (1999) *Journal of Peace Research*, Vol. 36 (6), 665–680 ;
Jyoti Khanna, Todd Sandler and Hirofumi Shimizu, 'Sharing the financial burden for UN and NATO peacekeeping, 1976–1996' (1998) *Journal of Conflict Resolution*, Vol. 42 (2), 176–195;
Jens Ringsmose, 'NATO burden sharing redux: Continuity and change after the Cold War' (2010) *Contemporary Security Policy*, Vol. 31(2), 319–338;
Rebecca Robison, 'NATO burden-sharing: A comprehensive framework for member evaluation' (2020) *Comparative Strategy*, Vol. 39 (3), 299–315;
Hirofumi Shimizu and Todd Sandler, 'Peacekeeping and burden sharing, 1994–2000' (2002) *Journal of Peace Research*, Vol. 39 (6), 651–668;
James Sperling and Mark Webber, 'NATO: From Kosovo to Kabul' (2009) *International Affairs*, Vol. 85(3), 491–511;
Benjamin Zyla, 'Who is free riding in NATO's peace operations in the 1990s?' (2016) *International Peacekeeping*, Vol. 23 (3), 416–441.

These issues of distribution of burden and fair contribution among NATO members are likely to emerge in the context of a potential European Defence Union (EDU). For analytical purposes, this study adopts a hypothetical scenario of an EDU—an official, institutionalized military alliance providing a framework of collective defense and security for all participating EU member states. Fontanel and Smith[24] were among the first to argue that an EDU could achieve significant economies of scale through the creation of joint armed forces, as opposed to the mere aggregation of national armies. The economic dimensions of European defense integration have since been explored by Guyot and Vranceanu,[25] Wolf and Zycher,[26] and Foucault.[27] Nevertheless, the development of an EDU must contend with key challenges, such as fair cost distribution and the risk of free-rider behavior.[28]

Within the EU, the issue of burden sharing has been examined by Kollias,[29] who analyzed the behavior of the EU-15 states regarding their contribution to collective military power, using 2001 data. He concluded that France, Greece, Italy, and the UK would contribute more than the benefits they would receive, while the remaining member states would contribute less relative to their expected gains. To update these findings, Beeres and Bollen[30] analyzed the period from 2006 to 2013 across an enlarged EU comprising 26 member states. Despite the temporal and geographic expansion, and the inclusion of additional benefit indicators, the key findings of Kollias were confirmed. France, Italy, the UK, and now Germany was shown to bear a disproportionately large share of the common defense burden. Conversely, the

[24] Jacques Fontanel and Ron Smith, 'A European defence union?' (1991) *Economic Policy*, Vol. 13 (3), 393–425.
[25] Marc Guyot and Radu Vranceanu, 'European defence: The cost of partial integration' (2001) *Defence and Peace Economics*, Vol. 12 (2), 157–174.
[26] Charles Wolf and Benjamin Zycher, 'European Military Prospects, Economic Constraints, and Rapid Reaction Force' (2001) *RAND Publications*.
[27] Martial Foucault, 'Does the European defence burden sharing matter?' (2008) in *War, Peace and Security*, pp. 297–314, Emerald Group Publishing.
[28] Keith Hartley, 'The future of European defence policy: An economic perspective' (2003) *Defence and Peace Economics*, Vol. 14 (2), 107–115.
[29] Christos Kollias, 'A preliminary investigation of the burden sharing aspects of a European Union common defence policy' *Defence and Peace Economics*, Vol. 19 (4), 253-263.
[30] Robert Beeres and Myriame Bollen, 'Towards a European Defence Union? Military burden sharing in the European Union 2006–2013' (2017) *Athens Journal of Social Sciences*, Vol. 4 (2), 147–160.

remaining member states—including Greece—continued to contribute less than the benefits they would likely derive from the EU's collective military strength.

2. Methodology

The analysis is grounded in the theoretical framework of public goods. The central hypothesis is that common European defense bears the characteristics of public good, governed by the principles of non-excludability and non-rivalry in consumption. Specifically, the security provided by a joint military force covers all alliance members, regardless of their individual contributions, and no member state can be excluded from its benefits, even if it does not contribute equally to its provision. This condition gives rise to the potential emergence of the 'free rider' phenomenon, where a state may avoid fair participation in the costs, expecting that others will shoulder the related obligations.

The analysis focuses on the period from 2014 to 2023. This period was selected due to historical, political, and institutional developments that influenced the level and distribution of defense spending in the EU.

- Post-2014, EU countries faced significant fiscal challenges due to the consequences of the financial crisis and subsequent fiscal consolidation,[31] which impacted member states' ability to finance defense and led to a reevaluation of burden-sharing mechanisms.
- Major geopolitical events such as the annexation of Crimea in 2014 and the subsequent revision of European security policy accelerated the need for redistribution of defense burdens.
- By 2014, all member states, including Croatia, had joined the EU's common defense architecture, enhancing collective response capacity.
- The United Kingdom's exit from the EU, completed in 2020, introduced new challenges to the balance of defense cost distribution among member states. The selected time frame allows analysis of both the pre- and post-Brexit periods.

[31] European Commission, 'Economic and Financial Affairs Annual Report' (2014) *European Commission*, Brussels.

- Russia's invasion of Ukraine in 2022 served as the most recent and significant catalyst for changes in defense burden distribution, as it led to sharp increases in defense spending and a redefinition of collective strategies.[32]
- Institutional developments such as the establishment of PESCO in 2017 strengthened defense cooperation.[33]
- The period spans two EU Multiannual Financial Frameworks (2014–2020 and 2021–2027), within which key defense funding tools were developed.[34]
- Finland and Sweden's accession to NATO in 2023 and 2024, respectively, has reshaped Europe's security environment and is expected to impact intra-EU burden-sharing dynamics.[35]

The study is methodologically grounded in the burden-sharing model initially developed by Sandler and Forbes[36] and subsequently employed by scholars such as Kollias,[37] and Beeres and Bollen.[38] This model compares each ally's share of total defense expenditures with the benefits it derives from alliance membership. For the purposes of the present quantitative analysis, geopolitical and social variables that influence alliance formation are treated as constant. The study does not aim to explain the international or political processes that led to renewed debates on European defence integration but rather focuses on the distribution of costs and benefits among EU member states, conditional upon the existence of a collective European defence arrangement. This assumption allows the analysis to isolate patterns of burden sharing within a hypothetical European Defence Union.

At the initial stage of the analysis, a burden-sharing measure is applied, whereby each member state's contribution to collective defense is calculated as its share of the total aggregated defense budget of the Union. This leads to the construction of a Burden Sharing Index (BSI), in which each country's defense expenditure is expressed as the

[32] European Defence Agency, 'Annual report on defence spending' (2023) *EDA*, Brussels.
[33] European External Action Service, 'Permanent Structured Cooperation (PESCO): Deepening defence cooperation among member states' (2024).
[34] European Parliament, 'Multiannual financial framework 2021–2027 and defence funding' (2021) *European Parliament*, Brussels.
[35] NATO, 'The Secretary General's annual report' (2024).
[36] Sandler and Forbes, (no 16) 430
[37] Kollias (no 29) 258
[38] Beeres and Bollen (no 30) 152

ratio of its national defense spending to the sum of all EU member states' defense budgets—considered the total cost of Europe's common defense capabilities. Clearly, the military strength and operational capacity of a potential EDU are understood as the aggregate of the national military forces and capabilities of the participating member states. However, it should be noted that the creation of such a Union would likely generate significant economies of scale through the harmonization and standardization of armaments, the pooling of resources, and specialization among allies. This framework enables meaningful comparisons of defense expenditure across member states.

Subsequently, the share of each EU member state in the total cost of common European defence spending is compared to the corresponding benefits derived from participation in a hypothetical European Defence Union. To quantify these benefits, it is necessary to identify the core variables that represent the value generated by the existence and operation of a collective defense alliance. The main benefits a member state receives from such participation include the protection of its territory, population, and economic wealth. These benefits are quantified using three indicators: (a) the country's share of total EU GDP, (b) its share of the EU's total land area, and (c) its share of the EU's total population. Since it is not known which security dimensions (land area, population, or GDP) are considered more important by each country, the assumption is made that all three dimensions carry equal weight. This equal-weight assumption follows established practice in the empirical literature on alliance burden sharing. As originally argued by Sandler and Forbes and subsequently adopted by Kollias as well as Beeres and Bollen, the absence of observable national utility functions necessitates the use of a simple arithmetic mean across benefit dimensions. While alternative weighting schemes could be employed, the selected approach ensures transparency, comparability across countries, and consistency with prior empirical studies. Therefore, the three percentage shares are added and divided by three to produce a simple arithmetic mean, which is defined as the Average Benefit Share (ABS). The ABS reflects the proportion of benefits each member state derives from its participation in the European Defence Union. Accordingly, the function representing the ABS is formulated as: ABS = f (Area, Population, GDP).

The comparison between the BSI and the ABS allows for the estimation of each state's net gains or losses from participating in the alliance. When a state's ABS exceeds its corresponding BSI, a positive Net Benefit (NB > 0) arises, potentially indicating free-rider behavior within the context of collective action. Conversely, when a state's ABS is lower than its BSI, the country appears to be bearing a disproportionate burden relative to the benefits it receives, resulting in a negative Net Benefit (NB < 0) and classifying it as an over-contributor.

However, it should be emphasized that comparisons between ABS and BSI assume that the alliance operates as a pure public good. In practice, though, each member state may also receive non-quantifiable private benefits from its participation. For example, in the hypothetical case of an EDU, Finland might derive particularly high geostrategic benefits due to its proximity to Russia and the heightened threat it faces—especially following the 2022 invasion of Ukraine. A European framework for collective deterrence and military support would significantly strengthen Finland's position against the Russian threat, effectively acting as a force multiplier. Although all members benefit from collective defense, Finland would likely gain more in strategic terms than countries such as Portugal or Luxembourg.

To expand the analysis further, an additional dimension related to the international economy is incorporated into the variables determining the benefits of the alliance's collective military capabilities. This approach assumes that globalization has intensified interdependence among national economies and that the external sector is a key driver of economic growth at the national level. In particular, the military capabilities of the alliance are not limited to protecting national resources and wealth within borders but also play a crucial role in safeguarding the flow of trade revenues and material resources entering and exiting the EU. Thus, military presence and operations at the international level constitute a core mechanism for protecting the alliance's external economic interests. To quantify this dimension, the variables of imports and exports for each country are added to the analytical framework. Accordingly, the ABS function is redefined as follows: ABS=f (Area, Population, GDP, Imports, Exports). For each member state, the ABS is recalculated as the arithmetic mean of its percentage share across the five selected variables.

Next, to further broaden the analysis and integrate the dimension of security threats affecting national interests, it becomes necessary to assess the level of protection against exposure to various types of threats. This more holistic approach includes, among others, terrorism—an aspect which, according to Beeres and Bollen,[39] constitutes a significant additional benefit of participating in a common defense effort, as it may reduce exposure to terrorist activity. Terrorism was first incorporated as a variable in the cost-benefit analysis of alliances by Sandler and Shimizu.[40] Modern security threats also encompass a broad range of internal challenges that can undermine the stability and functionality of the state. In this context, Armed Forces do not serve solely in national defense but also play a vital role in maintaining social cohesion and public order, acting as pillars of institutional security during periods of crisis or hybrid threats. Especially during times of intense migration pressure or increased cross-border criminal activity, the Armed Forces play a critical role in enhancing national security, contributing to the deterrence of external threats and the protection of territorial sovereignty. It should be noted that member states with external EU borders or proximity to geopolitically fragile regions face structurally higher security risks, generating positive security externalities for the rest of the Union. Countries such as Greece, Poland, and the Baltic states bear a disproportionate share of frontline security responsibilities, while the stabilizing effects extend beyond their national borders. This asymmetry is partly internalized in the present framework through the inclusion of the Security Apparatus Index in the ABS calculation, allowing higher threat exposure to translate into higher estimated benefits.

In this context, the 'Security Apparatus' indicator from the Fund for Peace[41] — a component of the Fragile States Index (FSI) — is utilized. This index reflects each state's level of exposure to security threats, considering factors such as bombings, armed attacks, conflict-related fatalities, as well as activities related to organized crime and terrorism, thus capturing the overall pressure exerted on national security. The index operates on a scale from 0 to 10, where 0 denotes the absence of security threats, and 10 indicates the highest possible level of threat. This evaluation allows national

[39] Beeres and Bollen (30) 154
[40] Todd Sandler and Hirofumi Shimizu, 'NATO burden sharing 1999–2010: An altered alliance'.
[41] Fund for Peace, 'Fragile States Index' (2025)

security conditions to be quantified as a comparable numerical value. Given that the EU functions as a system of interdependent states, the sum of all member states' security scores is considered indicative of the Union's aggregate exposure to security threats. By normalizing each country's score as a percentage of the total, this security dimension can be incorporated into the ABS framework as a comparable proportional benefit variable, representing each state's relative exposure to the overall level of security threats within the EU. Accordingly, the ABS function is further expanded as follows: ABS=f (Area, Population, GDP, Imports, Exports, Security Threats). The ABS value for each member state is recalculated using the same methodology—by taking the arithmetic mean of the country's share across the six variables and dividing by six.

Finally, the same calculation is performed for all 28 EU member states (EU-28), i.e., as the Union existed prior to the United Kingdom's withdrawal. The purpose is to compare results between EU-27 and EU-28, to assess how Brexit affected the respective indicators. This allows for a clearer view of the UK's contribution to the overall metrics and provides a more complete picture of the consequences of its departure.

The study utilizes reliable, comparable, and longitudinal datasets covering the military, economic, demographic, and institutional dimensions of EU member states' security. The sources were selected for their transparency, international credibility, and temporal comparability. Military expenditure data was obtained from the SIPRI Military Expenditure Database,[42] in constant 2023 USD. Data on land area, population, GDP, and foreign trade was drawn from the World Bank's World Development Indicators,[43] adjusted to constant 2015 USD to eliminate inflationary distortions. For security analysis, the Security Apparatus indicator from the Fragile States Index by the Fund for Peace was used, which assesses each state's exposure to security threats, considering factors such as the presence of armed non-state actors, organized crime, and the state's capacity to exercise control over its territory.

3. Comparative Economic and Security Data in the EU

[42] SIPRI, 'Military expenditure database' (2025) *Stockholm International Peace Research Institute*.
[43] World Bank, 'World development indicators' (2025).

The quantitative representation of key indicators for EU member states during the 2014–2023 period, as shown in Table 1, highlights disparities and inequalities within the European framework. The variables examined—geographical area, population, GDP, imports, and exports—are critical indicators of national power and the degree of integration into the EU's single market. These disparities are not merely statistical. They reflect political and institutional differences, varying levels of development, degrees of economic openness, and unequal capacities to leverage EU policies.

The 27 EU member states collectively span a geographical area of approximately 4.254 million square kilometers and host an average population of 446.5 million citizens. Germany, as the most populous country (over 82.7 million people), plays a decisive role in shaping the EU's demographic profile, while smaller states such as Malta and Luxembourg have fewer than 700,000 inhabitants—indicating the coexistence of significantly unequal states within the same institutional architecture. Similarly, geographical distribution varies widely, with countries like France, Spain, and Sweden each occupying over 500,000 square kilometers, while Luxembourg and Malta occupy minimal space on the European geopolitical map.

In terms of macroeconomic performance, the average GDP of the EU member states for the years 2014 to 2023 (in constant 2015 prices) shows even greater concentration. Germany accounts for nearly one-quarter of the average total GDP of the EU-27 (€3.57 trillion), followed by France (€2.53 trillion) and Italy (€1.89 trillion), revealing a 'core-periphery' structure within the Union, where a few large countries generate most of the total economic value. This picture becomes even more pronounced when per capita figures are considered, with small countries such as Ireland and Luxembourg recording exceptionally high GDP levels—an outcome of attracting significant foreign investment, focusing on financial and technological services, and benefiting from favorable regulatory and tax frameworks. Conversely, Southeast European countries such as Bulgaria and Croatia, despite their relatively large geographical size, exhibit extremely low GDP, indicating the existence of significant developmental gaps and structural barriers to endogenous accumulation.

Table 1: The EU in Figures (2014-2023)							
M-S	Area (in '000 km^2)	Population (in million)	GDP (in biilion $,constant 2015)	Imports (in biilion $,constant 2015)	Exports (in biilion $,constant 2015)	Security Threats	MilEx (million $, constant 2023)
Austria	83,9	8,8	400,1	211,9	226,1	1,42	3.944
Belgiun	30,7	11,5	485,0	405,5	409,0	2,37	5.901
Bulgaria	111,0	6,9	55,9	38,6	37,6	4,28	1.408
Croatia	88,0	4,0	56,5	29,0	27,9	3,17	1.206
Cyprus	9,2	1,3	24,2	19,8	20,1	3,95	462
Czechia	78,9	10,6	205,4	156,5	168,2	2,57	3.902
Denmark	42,9	5,8	328,4	170,5	191,6	1,49	5.028
Estonia	45,3	1,3	26,0	20,8	20,9	2,64	834
Finland	338,4	5,5	246,8	95,4	95,0	2,00	4.300
France	549,0	67,3	2.531,3	836,9	817,8	3,13	55.148
Germany	357,6	82,7	3.577,1	1.340,8	1.547,7	2,19	53.920
Greece	132,0	10,7	201,4	76,3	70,2	4,11	6.475
Hungary	93,0	9,8	140,0	120,8	127,4	2,47	2.542
Ireland	70,3	4,9	381,3	392,8	510,9	2,31	1.224
Italy	302,1	59,9	1.894,4	534,4	578,6	4,75	32.103
Latvia	64,5	1,9	28,6	20,6	19,0	2,85	783
Lithuania	65,3	2,8	47,3	36,4	38,5	2,82	1.331
Luxembourg	2,5	0,6	65,6	108,1	129,8	1,31	405
Malta	0,3	0,5	14,1	15,3	17,3	2,93	80
Netherlands	41,5	17,3	836,3	644,5	730,1	1,95	13.084
Poland	312,7	37,6	553,1	275,4	291,5	2,22	15.867
Portugal	92,2	10,3	213,0	93,1	91,9	1,01	3.518
Romania	238,4	19,4	205,9	105,8	94,5	2,73	4.926
Slovakia	49,0	5,4	96,2	87,3	90,1	1,76	1.876
Slovenia	20,4	2,0	48,1	36,9	40,5	1,22	656
Spain	528,9	47,1	1.270,6	367,9	434,4	3,22	19.186
Sweden	506,0	10,1	534,9	232,3	251,1	2,37	6.452
TOTAL	**4.254,0**	**446,5**	**14.468,3**	**6.504,2**	**7.078,7**	**69,24**	**246.561**

Source: World Bank (Area, Population, GDP,Imports,Exports), SIPRI (MilEx), Fund for Peace (Security Threats)

The trade dimension reinforces the broader picture of inequalities within the EU. Germany leads by a wide margin in both exports and imports, highlighting the export-oriented nature of the German economy, which is based on a highly developed and globalized industrial complex. The case of Ireland is particularly noteworthy: despite its small population size, it reports exports exceeding €510 billion—an amount far surpassing even Italy's exports. In contrast, countries such as Greece, Bulgaria, and Cyprus show low levels of trade openness, a feature linked to limited production scale,

small domestic markets, and relatively low technological intensity in their production structures.

The 'Security Apparatus Index' combines factors such as geopolitical stability, military risks, terrorism, energy security, and migration pressures, offering a more comprehensive picture of risk. The highest scores are recorded in countries that are either located in geopolitically unstable regions or face enduring threats at their external borders, such as Italy (4.75), Bulgaria (4.28), Greece (4.11), and Cyprus (3.95). In contrast, Central and Northern European countries such as Luxembourg (1.31), Austria (1.42), and Denmark (1.49) show low threat levels, reflecting their stable geopolitical environments and limited exposure to instability.

The total average military expenditure of the 27 EU member states during the period reaches $246.5 billion—a significant amount, albeit unevenly distributed. The absence of a unified European army, differing national strategic priorities, and disparities in resources and threats have resulted in a fragmented defense landscape. France ($55.1 billion) and Germany ($53.9 billion) consistently top the list of military expenditures within the EU-27. These two countries bear the largest defense burden, not only due to their demographic and economic weight but also because of the international roles they pursue. France invests heavily in defense due to its nuclear deterrent and global military presence. Italy ($32.1 billion) and Spain ($19.2 billion) follow, assuming a relatively significant defense role in the Mediterranean periphery. Poland ($15.8 billion), especially over the past decade, has recorded a remarkable increase in military spending—directly linked to developments in Eastern Europe and the perceived threat from Russia following the annexation of Crimea and the invasion of Ukraine. Notably, countries such as Greece ($6.5 billion) and Cyprus ($462 million), despite their comparatively small) size, exhibit proportionally high military expenditures relative to their GDP and population. Greece has consistently maintained high defense spending due to its geopolitical rivalry with Turkey, unresolved issues in the Aegean, and intensifying pressure at its borders. On the other hand, countries like Luxembourg ($405 million) and Ireland ($1.2 billion) deliberately maintain a limited defense footprint.

In summary, the analysis of the data presented in Table 1 confirms the heterogeneous nature of the European Union—not only in terms of the size and economic weight of its member states but also in the way they perceive and address geostrategic challenges. These structural differences are critical in understanding the (non-)uniformity of member state approaches to economic policy, foreign policy, and security.

4. Burden Sharing in the EU-27

The hypothetical establishment of the EDU creates the need to assess the balance between the benefits each member state enjoys and the financial burden it is required to bear. In this context, Table 2 presents the ABS and the BSI, with the aim of calculating the NB, that is, the difference between the two. Each column displays the percentage share of each country relative to the EU total for the corresponding variable. For example, Italy's share in the EU's total land area amounts to 7.10%, in total population to 13.42%, and in total GDP to 13.09%. The ABS, which is the average of these three variables, stands at 11.21%. Meanwhile, the BSI—reflecting the country's relative contribution to the cost of common European defense through its military expenditures—is 13.02%.

Comparison of the two indices reveals significant discrepancies in the symmetry between benefit and burden. Specifically, 20 countries show a positive NB, indicating that they benefit from collective defense to a greater extent than their proportional contribution. Typical examples include Sweden (3.34), Spain (2.80), Finland (1.89), Romania (1.80), and Ireland (1.30). These countries would receive considerable benefits in terms of territorial and population security without assuming a corresponding economic burden.

In contrast, seven EU member states record a negative NB. In particular, the countries exhibiting this condition of over-contribution are Belgium (-0.18), Denmark (-0.51), France (-7.21), Germany (-4.65), Greece (-0.33), Italy (-1.81), and the Netherlands (-1.76). These negative values indicate that these states would bear a disproportionate burden relative to the expected benefits from a collective defense system. This suggests that such countries would be more heavily impacted by the

implementation of a joint European defense mechanism, given their current economic, demographic, and geographic characteristics. France and Germany, with BSIs exceeding 21%, shoulder the most disproportionate share of the cost due to their high levels of military spending. This situation creates conditions of unequal burden, calling into question the sustainability of a collective defense policy without accompanying balancing mechanisms.

Table 2: Contribution to Burden and Benefits from an EDU (Variables: Area,Population, GDP)

M-S	Area (Percentage Share)	Population (Percentage Share)	GDP (Percentage Share)	ABS	BSI	NB
Austria	1,97	1,98	2,77	2,24	1,60	0,64
Belgiun	0,72	2,57	3,35	2,21	2,39	-0,18
Bulgaria	2,61	1,56	0,39	1,52	0,57	0,95
Croatia	2,07	0,89	0,39	1,12	0,49	0,63
Cyprus	0,22	0,29	0,17	0,22	0,19	0,04
Czechia	1,85	2,38	1,42	1,88	1,58	0,30
Denmark	1,01	1,30	2,27	1,53	2,04	-0,51
Estonia	1,07	0,30	0,18	0,51	0,34	0,18
Finland	7,96	1,24	1,71	3,63	1,74	1,89
France	12,91	15,07	17,50	15,16	22,37	-7,21
Germany	8,41	18,52	24,72	17,22	21,87	-4,65
Greece	3,10	2,39	1,39	2,30	2,63	-0,33
Hungary	2,19	2,18	0,97	1,78	1,03	0,75
Ireland	1,65	1,10	2,64	1,80	0,50	1,30
Italy	7,10	13,42	13,09	11,21	13,02	-1,81
Latvia	1,52	0,43	0,20	0,72	0,32	0,40
Lithuania	1,53	0,64	0,33	0,83	0,54	0,29
Luxembourg	0,06	0,14	0,45	0,22	0,16	0,05
Malta	0,01	0,11	0,10	0,07	0,03	0,04
Netherlands	0,98	3,88	5,78	3,54	5,31	-1,76
Poland	7,35	8,43	3,82	6,53	6,44	0,10
Portugal	2,17	2,32	1,47	1,99	1,43	0,56
Romania	5,60	4,35	1,42	3,79	2,00	1,80
Slovakia	1,15	1,22	0,67	1,01	0,76	0,25
Slovenia	0,48	0,47	0,33	0,43	0,27	0,16
Spain	12,43	10,54	8,78	10,59	7,78	2,80
Sweden	11,89	2,28	3,70	5,96	2,62	3,34

Advancing the analysis to the next stage, the dimension of protecting each member state's international economic interests is incorporated into the benefit calculation, by adding international trade figures—namely, imports and exports.

The evaluation of the findings in Table 3 reveals that six member states display a negative NB, indicating over-contribution to the collective European defense system. These countries are required to bear a greater burden than is proportional to their relative size and role in the European economy. France, with an NB of -8.39, emerges as the most burdened country, having an exceptionally high BSI (22.37). Germany, despite being the Union's largest economy, also exhibits a notable imbalance (NB -3.04), as does Italy (NB -3.02), despite its large trade volume and population factor. This negative net contribution is not limited to large economies; it also extends to countries such as Poland (NB -0.84) and Greece (NB -0.82). Although Poland records high shares in population (8.43%) and land area (7.35%), it does not receive a proportional benefit, as its GDP and trade volume lag their respective EU averages. Denmark, with a marginally negative NB (-0.06), sits at the threshold between benefit and burden. Its high trade activity (exports 2.71%, imports 2.62%) and strong economy place it among the EU's most active trading nations, yet these are not sufficient to offset its relative contribution based on a BSI of 2.04.

In contrast, 21 member states record a positive NB, reflecting under-contribution, that is, a benefit received greater than the respective share in the collective burden. Particularly notable is the case of Ireland (NB 3.23), which shows the highest positive deviation. This outcome is primarily explained by Ireland's exceptionally high involvement in international trade: its imports and exports amount to 6.04% and 7.22% of the EU-27 total, respectively—figures that far exceed its demographic (1.10%) and geographic (1.65%) weight. The strong outward orientation of the Irish economy, combined with its relatively low weight in other variables, amplifies the country's net gains from European defense integration. Similarly, countries such as Sweden (2.38), Belgium (1.34), Spain (1.02), Austria (1.03), Finland (1.00), and Romania (0.87) show positive NB values, while smaller economies such as Luxembourg (0.67) and Malta (0.11) also benefit.

It is worth noting that compared to the initial benefit calculation—which was based solely on land area, population, and GDP—the expanded analysis incorporating international trade dimensions (imports and exports) results in changes in the relative positions of certain member states. In particular, the Netherlands, due to its highly active external trade (imports 9.91%, exports 10.31% of the EU-27 total), as well as

Belgium, now rank among the countries with positive NB. Conversely, Poland, which in the previous model was among the net beneficiaries, now records a negative NB, placing it among the countries that over-contribute to the European defense system.

Table 3: Contribution to Burden and Benefits from an EDU (Variables: Area,Population, GDP, Imports, Exports)

M-S	Area (Percentage Share)	Population (Percentage Share)	GDP (Percentage Share)	Imports (Percentage Share)	Exports (Percentage Share)	ABS	BSI	NB
Austria	1,97	1,98	2,77	3,26	3,19	2,63	1,60	1,03
Belgiun	0,72	2,57	3,35	6,23	5,78	3,73	2,39	1,34
Bulgaria	2,61	1,56	0,39	0,59	0,53	1,14	0,57	0,56
Croatia	2,07	0,89	0,39	0,45	0,40	0,84	0,49	0,35
Cyprus	0,22	0,29	0,17	0,31	0,28	0,25	0,19	0,06
Czechia	1,85	2,38	1,42	2,41	2,38	2,09	1,58	0,51
Denmark	1,01	1,30	2,27	2,62	2,71	1,98	2,04	-0,06
Estonia	1,07	0,30	0,18	0,32	0,30	0,43	0,34	0,09
Finland	7,96	1,24	1,71	1,47	1,34	2,74	1,74	1,00
France	12,91	15,07	17,50	12,87	11,55	13,98	22,37	-8,39
Germany	8,41	18,52	24,72	20,61	21,86	18,83	21,87	-3,04
Greece	3,10	2,39	1,39	1,17	0,99	1,81	2,63	-0,82
Hungary	2,19	2,18	0,97	1,86	1,80	1,80	1,03	0,77
Ireland	1,65	1,10	2,64	6,04	7,22	3,73	0,50	3,23
Italy	7,10	13,42	13,09	8,22	8,17	10,00	13,02	-3,02
Latvia	1,52	0,43	0,20	0,32	0,27	0,55	0,32	0,23
Lithuania	1,53	0,64	0,33	0,56	0,54	0,72	0,54	0,18
Luxembourg	0,06	0,14	0,45	1,66	1,83	0,83	0,16	0,67
Malta	0,01	0,11	0,10	0,24	0,24	0,14	0,03	0,11
Netherlands	0,98	3,88	5,78	9,91	10,31	6,17	5,31	0,87
Poland	7,35	8,43	3,82	4,24	4,12	5,59	6,44	-0,84
Portugal	2,17	2,32	1,47	1,43	1,30	1,74	1,43	0,31
Romania	5,60	4,35	1,42	1,63	1,34	2,87	2,00	0,87
Slovakia	1,15	1,22	0,67	1,34	1,27	1,13	0,76	0,37
Slovenia	0,48	0,47	0,33	0,57	0,57	0,48	0,27	0,22
Spain	12,43	10,54	8,78	6,12	6,14	8,80	7,78	1,02
Sweden	11,89	2,28	3,70	3,57	3,55	5,00	2,62	2,38

Finally, by further expanding the analysis, the security dimension is incorporated in Table 4, aiming to provide a more multidimensional representation of each member state's contribution and benefits within the European collective defense system. The integration of the security threat level index does not substantially alter the classification of countries as over- or under-contributors. However, it highlights states with limited economic power but under significant geopolitical pressure.

The analysis of the findings in Table 4 reveals that six countries show negative NB values, indicating over-contribution to the European collective system. The most prominent cases are France (-9.96) and Germany (-5.65), which bear a heavy burden. In these cases, the security threat index is relatively low, resulting in minimal additional benefit from including the security variable in the ABS calculation. In short, because these countries do not face a high level of threats, the new variable does not significantly improve their negative standing. Conversely, in the case of Greece (-0.13), which records higher values in the security threat index, the inclusion of this variable notably reduces the negative NB.

In contrast, 21 member states appear as under-contributors, meaning they derive more benefits than their corresponding share of the burden. Among them, countries such as Ireland (NB 3.17), Sweden (NB 2.12), Bulgaria (NB 1.41), and Hungary (NB 1.06) stand out, as their net benefits significantly exceed their proportional contribution. The inclusion of the security index particularly strengthens the position of geopolitically exposed countries such as Cyprus, Croatia, Latvia, and Lithuania, whose NB increases notably due to their proximity to sources of instability and threats.

Table 4: Contribution to Burden and Benefits from an EDU (Variables: Area,Population, GDP, Imports, Exports, Security Threats)

M-S	Area (Percentage Share)	Population (Percentage Share)	GDP (Percentage Share)	Imports (Percentage Share)	Exports (Percentage Share)	Security Threats (Percentage Share)	ABS	BSI	NB
Austria	1,97	1,98	2,77	3,26	3,19	2,05	2,54	1,60	0,94
Belgiun	0,72	2,57	3,35	6,23	5,78	3,42	3,68	2,39	1,29
Bulgaria	2,61	1,56	0,39	0,59	0,53	6,18	1,98	0,57	1,41
Croatia	2,07	0,89	0,39	0,45	0,40	4,58	1,46	0,49	0,97
Cyprus	0,22	0,29	0,17	0,31	0,28	5,70	1,16	0,19	0,97
Czechia	1,85	2,38	1,42	2,41	2,38	3,71	2,36	1,58	0,78
Denmark	1,01	1,30	2,27	2,62	2,71	2,15	2,01	2,04	-0,03
Estonia	1,07	0,30	0,18	0,32	0,30	3,81	1,00	0,34	0,66
Finland	7,96	1,24	1,71	1,47	1,34	2,89	2,77	1,74	1,02
France	12,91	15,07	17,50	12,87	11,55	4,52	12,40	22,37	-9,96
Germany	8,41	18,52	24,72	20,61	21,86	3,16	16,22	21,87	-5,65
Greece	3,10	2,39	1,39	1,17	0,99	5,94	2,50	2,63	-0,13
Hungary	2,19	2,18	0,97	1,86	1,80	3,57	2,09	1,03	1,06
Ireland	1,65	1,10	2,64	6,04	7,22	3,34	3,66	0,50	3,17
Italy	7,10	13,42	13,09	8,22	8,17	6,86	9,48	13,02	-3,54
Latvia	1,52	0,43	0,20	0,32	0,27	4,12	1,14	0,32	0,82
Lithuania	1,53	0,64	0,33	0,56	0,54	4,07	1,28	0,54	0,74
Luxembourg	0,06	0,14	0,45	1,66	1,83	1,89	1,01	0,16	0,84
Malta	0,01	0,11	0,10	0,24	0,24	4,23	0,82	0,03	0,79
Netherlands	0,98	3,88	5,78	9,91	10,31	2,82	5,61	5,31	0,31
Poland	7,35	8,43	3,82	4,24	4,12	3,21	5,19	6,44	-1,24
Portugal	2,17	2,32	1,47	1,43	1,30	1,46	1,69	1,43	0,26
Romania	5,60	4,35	1,42	1,63	1,34	3,94	3,05	2,00	1,05
Slovakia	1,15	1,22	0,67	1,34	1,27	2,54	1,37	0,76	0,60
Slovenia	0,48	0,47	0,33	0,57	0,57	1,76	0,70	0,27	0,43
Spain	12,43	10,54	8,78	6,12	6,14	4,65	8,11	7,78	0,33
Sweden	11,89	2,28	3,70	3,57	3,55	3,42	4,74	2,62	2,12

5. Comparison of Burden Sharing in the EU-27 and EU-28

The following analysis is based on Table 5, which presents the burden-sharing distribution among EU member states, expanding the sample to include 28 countries by incorporating the United Kingdom. The inclusion of the United Kingdom allows for a comparison with the EU-27 (see Table 4) and offers an estimate of its contribution to the overall balance of costs and benefits within the Union.

Table 5: Contribution to Burden and Benefits from an EDU-28 (Variables: Area, Population, GDP, Imports, Exports, Security Threats)

M-S	Area (Percentage Share)	Population (Percentage Share)	GDP (Percentage Share)	Imports (Percentage Share)	Exports (Percentage Share)	Security Threats (Percentage Share)	ABS	BSI	NB
Austria	1,86	1,72	2,28	2,86	2,84	1,96	2,26	1,26	0,99
Belgiun	0,68	2,24	2,77	5,47	5,14	3,28	3,26	1,89	1,38
Bulgaria	2,47	1,35	0,32	0,52	0,47	5,92	1,84	0,45	1,39
Croatia	1,96	0,78	0,32	0,39	0,35	4,39	1,36	0,39	0,98
Cyprus	0,21	0,25	0,14	0,27	0,25	5,46	1,10	0,15	0,95
Czechia	1,75	2,07	1,17	2,11	2,11	3,56	2,13	1,25	0,88
Denmark	0,95	1,13	1,87	2,30	2,41	2,06	1,79	1,61	0,18
Estonia	1,01	0,26	0,15	0,28	0,26	3,65	0,94	0,27	0,67
Finland	7,52	1,08	1,41	1,29	1,19	2,77	2,54	1,38	1,17
France	12,21	13,12	14,45	11,30	10,28	4,33	10,95	17,64	-6,70
Germany	7,95	16,12	20,42	18,10	19,45	3,03	14,18	17,25	-3,07
Greece	2,93	2,08	1,15	1,03	0,88	5,69	2,29	2,07	0,22
Hungary	2,07	1,90	0,80	1,63	1,60	3,42	1,90	0,81	1,09
Ireland	1,56	0,96	2,18	5,30	6,42	3,20	3,27	0,39	2,88
Italy	6,72	11,68	10,82	7,21	7,27	6,57	8,38	10,27	-1,89
Latvia	1,44	0,38	0,16	0,28	0,24	3,94	1,07	0,25	0,82
Lithuania	1,45	0,55	0,27	0,49	0,48	3,90	1,19	0,43	0,77
Luxembourg	0,06	0,12	0,37	1,46	1,63	1,81	0,91	0,13	0,78
Malta	0,01	0,10	0,08	0,21	0,22	4,05	0,78	0,03	0,75
Netherlands	0,92	3,37	4,78	8,70	9,18	2,70	4,94	4,19	0,76
Poland	6,95	7,33	3,16	3,72	3,66	3,07	4,65	5,08	-0,43
Portugal	2,05	2,02	1,22	1,26	1,16	1,40	1,52	1,13	0,39
Romania	5,30	3,79	1,18	1,43	1,19	3,78	2,78	1,58	1,20
Slovakia	1,09	1,06	0,55	1,18	1,13	2,43	1,24	0,60	0,64
Slovenia	0,46	0,41	0,27	0,50	0,51	1,69	0,64	0,21	0,43
Spain	11,76	9,18	7,25	5,37	5,46	4,45	7,25	6,14	1,11
Sweden	11,25	1,98	3,05	3,14	3,16	3,28	4,31	2,06	2,25
UK	5,42	12,96	17,40	12,21	11,05	4,22	10,54	21,12	-10,58

The United Kingdom, although accounting for only 5.42% of the EU's land area, represents 12.96% of its population and 17.40% of its GDP, indicating a strong concentration of demographic and economic resources. At the same time, it accounts for 12.21% of total imports and 11.05% of total exports, confirming its role as a key player in European trade. However, its share of the 'security threats' index is just 4.22%, indicating a relatively limited level of threat in the security domain as defined within the present methodology. The United Kingdom records an ABS of 10.54 and an

exceptionally high BSI (Burden Sharing Index) of 21.12, making it the country bearing the greatest "burden" within the Union. Its NB is negative, amounting to -10.58, clearly highlighting a mismatch between its share of cost and the benefits it receives.

The exit of the United Kingdom from the EU entails both burdens and benefits. This impact is clearly illustrated in Table 6, which compares the relevant indicators of the EU-27, after the UK's withdrawal, with those of the EU-28 during its membership. Specifically, there is a deterioration in the position of most member states, particularly those that were already bearing a disproportionately high economic burden. Germany records a significant deterioration in its NB, which shifts from -3.07 in the EU-28 to -5.65 in the EU-27. France also shows further decline, with its NB increasing from -6.70 to -9.96. A similar negative change is observed in Italy, where the NB drops from -1.89 to -3.54. This downward trend is not limited to traditionally high-contributing states. Poland, which in the EU-28 had a slightly negative NB (-0.43), now records a deterioration to -1.24 in the EU-27. Conversely, very few member states marginally benefit from redistribution and improve their net benefit. Notably, Ireland consistently maintains its position as a net beneficiary, improving its NB from 2.88 to 3.17.

Particularly interesting are the cases of countries that change their participation category. Specifically, Denmark shifts from being a net beneficiary, with an NB of 0.18 in the EU-28, to a marginal net contributor, with an NB of -0.03 in the EU-27. A similar change is observed in Greece, which moves from being a net beneficiary with a score of 0.22 to a slightly net contributing country, with an NB of -0.13.

Table 6: Burden Sharing in EU-27 and EU-28 (Variables: Area,Population, GDP, Imports, Exports, Security Threats)

M-S	ABS EU-27	BSI EU-27	NB EU-27	ABS EU-28	BSI EU-28	NB EU-28
Austria	2,54	1,60	**0,94**	2,26	1,26	**0,99**
Belgiun	3,68	2,39	**1,29**	3,26	1,89	**1,38**
Bulgaria	1,98	0,57	**1,41**	1,84	0,45	**1,39**
Croatia	1,46	0,49	**0,97**	1,36	0,39	**0,98**
Cyprus	1,16	0,19	**0,97**	1,10	0,15	**0,95**
Czechia	2,36	1,58	**0,78**	2,13	1,25	**0,88**
Denmark	2,01	2,04	**-0,03**	1,79	1,61	**0,18**
Estonia	1,00	0,34	**0,66**	0,94	0,27	**0,67**
Finland	2,77	1,74	**1,02**	2,54	1,38	**1,17**
France	12,40	22,37	**-9,96**	10,95	17,64	**-6,70**
Germany	16,22	21,87	**-5,65**	14,18	17,25	**-3,07**
Greece	2,50	2,63	**-0,13**	2,29	2,07	**0,22**
Hungary	2,09	1,03	**1,06**	1,90	0,81	**1,09**
Ireland	3,66	0,50	**3,17**	3,27	0,39	**2,88**
Italy	9,48	13,02	**-3,54**	8,38	10,27	**-1,89**
Latvia	1,14	0,32	**0,82**	1,07	0,25	**0,82**
Lithuania	1,28	0,54	**0,74**	1,19	0,43	**0,77**
Luxembourg	1,01	0,16	**0,84**	0,91	0,13	**0,78**
Malta	0,82	0,03	**0,79**	0,78	0,03	**0,75**
Netherlands	5,61	5,31	**0,31**	4,94	4,19	**0,76**
Poland	5,19	6,44	**-1,24**	4,65	5,08	**-0,43**
Portugal	1,69	1,43	**0,26**	1,52	1,13	**0,39**
Romania	3,05	2,00	**1,05**	2,78	1,58	**1,20**
Slovakia	1,37	0,76	**0,60**	1,24	0,60	**0,64**
Slovenia	0,70	0,27	**0,43**	0,64	0,21	**0,43**
Spain	8,11	7,78	**0,33**	7,25	6,14	**1,11**
Sweden	4,74	2,62	**2,12**	4,31	2,06	**2,25**
UK				10,54	21,12	**-10,58**

6. Conclusions

Assuming the establishment of the EDU in the form of an institutionalized military alliance, this study highlighted the critical issue of the distribution of defense burdens—an issue that is bound to arise due to the nature of collective defense as a public good. In any common defense system, there are disincentives to balanced participation and the emergence of 'free rider' behavior, especially when security is non-rivalrous and non-excludable.

To quantitatively reflect this asymmetry, two key indicators were developed and applied: the BSI (Burden Sharing Index), which captures each state's relative

contribution to the total cost of collective defense, and the ABS (Average Benefit Share), which expresses the comparative benefits each member state derives from the existence of common military power. The ABS was constructed progressively, incorporating not only traditional variables (territory, population, GDP), but also external trade parameters (imports, exports) and the level of security threats (Security Apparatus Index).

The comparison between the two indicators for EU member states over the 2014–2023 period revealed consistent patterns of divergence. Most countries (21 out of 27) were identified as net beneficiaries, receiving more benefits than their relative share of defense costs would imply. Notable examples include Ireland, Sweden, and Bulgaria, which demonstrate under-contribution relative to the gains accrued. In contrast, six countries—France, Germany, Italy, Greece, Poland, and, to a lesser extent, Denmark—were recorded as net contributors, bearing a disproportionate share of the costs without receiving commensurate benefits.

The comparative analysis between the EU-27 and EU-28, with the inclusion of the United Kingdom, demonstrated the destabilizing effect of its departure. The UK's contribution—as one of the EU's most militarily and economically powerful countries—functioned as a 'balancing mechanism' in the overall burden-benefit equation. After Brexit, the financial burden further shifted to countries like Germany and France, exacerbating existing imbalances.

These findings underscore the need for the development of compensatory mechanisms, flexible contribution schemes, and differentiated obligations, in order to avoid discouraging participation by states that shoulder a greater share of the burden. As the EU moves toward greater strategic autonomy and the potential establishment of a permanent joint military capability, it is essential to ensure both the effectiveness and institutional fairness of the collective security system.

Finally, it should be emphasized that any prospective European Defence Union is not merely a technical or economic project but also a profoundly political one. Effective burden sharing presupposes a sufficient degree of alignment in foreign policy orientations, strategic cultures, and national interests among participating states. While the present study focuses on the quantitative distribution of costs and benefits, the

political feasibility of a collective defence arrangement remains a necessary precondition for its implementation.

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