



ACADEMIA MILITAR

National Defense Expenditures and the Role of the European Defense Agency

Aspirante de Administração Militar Leonel Ferreira Guedes

Dissertação de Mestrado

Ciências Militares na Especialidade de Administração Militar

Orientador: Tenente-Coronel de Infantaria João Carlos Gonçalves dos Reis

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RESUMO

Esta dissertação de mestrado seguiu uma estrutura integrada de dois artigos, posteriormente submetidos para publicação e que oferecem contributos essenciais quando abordamos o tema das despesas com a defesa nacional e o papel desempenhado pela Agência Europeia de Defesa. O contexto europeu atual é marcado por desafios geopolíticos e constantes evoluções na área tecnológica, o que reforça a importância da cooperação entre Estados-Membros e da otimização dos investimentos militares. Neste âmbito, o objetivo geral da investigação consiste em compreender de que forma é que a EDA contribui eficazmente para otimizar os orçamentos de defesa dos países membros da União Europeia. A abordagem metodológica por artigos que foi adotada, combina uma revisão sistemática da literatura com um estudo misto, que integra análise quantitativa da despesa com a defesa dos estados-membros, complementada por entrevistas semiestruturadas a especialistas na área.

Os resultados evidenciam a relevância dos mecanismos europeus, como a EDA, Cooperação Estruturada Permanente (PESCO) e o Fundo Europeu de Defesa e o seu papel em mitigar as limitações orçamentais dos países, através da interoperabilidade e cooperação. Portugal apresenta casos de sucesso na participação estratégica em programas europeus. No entanto, é imperativo recorrer à cooperação mais frequentemente, de modo a aumentar a sua capacidade de defesa. Adicionalmente, a análise quantitativa confirma uma correlação significativa entre as prioridades orçamentais internas e a despesa na defesa nacional, surgindo como destaque o papel central das decisões políticas na promoção de uma defesa europeia integrada.

Esta dissertação propõe a existência de um modelo teórico-conceitual com o objetivo de alinhar as estratégias nacionais de defesa com as iniciativas da EDA e reforçar a autonomia estratégica no setor da defesa. Ao integrar as especificidades de Portugal com as tendências de defesa europeias, este trabalho oferece um contributo fulcral, tanto para a comunidade científica como para a formulação de políticas na área da segurança e defesa.

Palavras-chave: Agência Europeia de Defesa; Orçamentos de defesa; União Europeia; Cooperação europeia; Defesa Nacional.

ABSTRACT

This master's dissertation followed an integrated structure of two articles, which were later submitted for publication. These articles offer essential contributions into the issue of national defense spending and the role played by the European Defense Agency (EDA). The current European context is characterized by geopolitical challenges and continuous technological advancements, emphasizing the importance of collaboration among member states and the optimization of military investments. In the light of this background, the goal of this study is to explore ways in which the EDA effectively contributes to optimize the defense budgets of European Union member states. The adopted methodological approach combines a systematic literature review with a mixed-methods study, including a quantitative analysis of member states defense spending and semi-structured interviews with experts in the field.

The findings highlight the importance of European mechanisms such as the EDA, Permanent Structured Cooperation (PESCO) and the European Defense Fund, and demonstrate how they can help countries to overcome budgetary limitations by promoting interoperability and cooperation. Portugal has experienced success through its strategic participation in European programs. However, it is crucial that it cooperates more frequently in order to increase its defense capacity. Additionally, the quantitative analysis confirms a significant correlation between internal budgetary priorities and national defense spending, emphasizing the pivotal role of political decisions in fostering an integrated European defense.

This dissertation proposes a theoretical-conceptual model that aims to align national defense strategies with EDA recommendations and strengthen strategic autonomy in the defense sector. By integrating Portugal's specific objectives with European defense initiatives, this work brings a significant contribution to both the scientific community and the development of security and defense policies.

Keywords: European Defense Agency; Defense budgets; European Union; European cooperation; National defense.

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LIST OF INITIALS AND ACRONYMS

A

AI	Artificial Intelligence
AMIDA	Automated Modelling, Identification and Damage Assessment
ASAP	Act in Support of Ammunition Production

C

CAIH	Cyber Academia and Innovation Hub
CAP	Capability, Armament & Planning Directorate
CapTechs.	Capability Technology Areas
CARD	Coordinated Annual Review on Defense
CDP	Capability Development Plan
CEDN	Conceito Estratégico de Defesa Nacional
CSDP	Common Security and Defense Policy

E

EDA	European Defense Agency
EDF	European Defense Fund
EDI	European Defense Industry
EDITB	European Defense Industrial Technological Base
EEAS	European External Action Service
EPF	European Peace Facility
EU	European Union
EUGS	European Union Global Strategy
EUMAM	EU Military Assistance Mission
EUMS	European Union Military Staff

G

GDP	Gross Domestic Product
-----	------------------------

M

MHTC	Multinational Helicopter Training Centre
MPLs	Military Programming Laws
MS	Member States
MUSAS	Maritime Unmanned Anti-Submarine System

N

NATO North Atlantic Treaty Organization

P

PESCO Permanent Structured Cooperation

PRISMA Preferred Reporting Items for Systematic reviews and Meta-Analyses

R

R&D Research and Development

RQ Research Question

S

SLR Systematic Literature Review

U

UAS Unmanned Aircraft System

INTRODUCTION

This thesis explores how the European Defense Agency manages to contribute to the national defense expenditures, by promoting coordination among Member States.

This research represents an original contribution to an emerging and critically important field of inquiry, by examining the correlation between national defense spending, the existing coordination mechanisms and strategic autonomy in the context of the European Union. Despite its growing relevance in the context of EU integration, there are no specific studies that comprehensively study the EDA's impact on national expenditures decisions, making this research both appropriate and necessary.

In recent years, the defense dynamics have suffered significant transformations that lead to a renewed attention to the structure, allocation and effectiveness of national defense expenditures. As the EU fronts complex geopolitical realities, including the resurgence of security threats and the emergence of challenges such as hybrid warfare and energy insecurity, there is a constant need for coordinated defense strategies (Mustonen-Ollila et al., 2020). Regarding this changing strategic environment, the EDA has become a crucial organization that is responsible for improving interoperability and to promote capabilities development and joint military initiatives (Chang, 2011). Consequently, the role of this mechanism is not an easy task as it also depends on the will of the MS (Chappell & Petrov, 2012). Furthermore, the agency aspires to mitigate the expenditures of the MS. Initiatives like joint procurement, armament development and research and technology (R&T) expansion are essential subjects that require a growing attention, with the aim of improving the European Defense Industry (EDI) (Kolín, 2010).

Considering the above, this thesis equally focuses on the relationship between EDA and other EU institutional frameworks, such as Permanent Structured Cooperation (PESCO), Coordinated Annual Review on Defense (CARD) and the European Defense Fund (EDF). It is vital to understand how these defense mechanisms interact and complement each other in order to expand the strategic output of the EDI.

Morover, understanding the importance of national defense expenditures in the context of the EU is essential for evaluating the strategic priorities of MS. Defense spending is not only a reflection of national security concerns but also an indicator of political will, economic capability and institutional alignment. Analyzing these expenditures over time allows for the identification of trends, disparities and evolving strategic priorities across the

EU (Kollias et al., 2007). In this regard, the EDA plays a pivotal role, not as a direct actor in national budgeting, but as a facilitator of cooperation, efficiency and strategic coherence. Accordingly, this thesis dedicates a chapter to analyse how defense budgets vary across the EU and how institutional mechanisms, particularly those led by the EDA, can support a more integrated and rational approach to the defense industry.

These considerations naturally lead to the core objective of this research: how national defense expenditures across EU Member States are structured, influenced and optimized through the EDA and their mechanisms. With the aim of investigating this relationship between institutional coordination and national spending decision making, this research is guided by three research questions: *RQ1*: What is the role of the EDA in national defense expenditures?; *RQ2*: To what extent do defense expenditures differ across EU member states when measured as a percentage of GDP?; *RQ3*: How does the European Defense Agency contribute to enhancing defense spending efficiency within the EU?. These research questions provide the structural foundation for this thesis, allowing for a comprehensive exploration of defense policy and expenditure patterns in the EU.

To address these questions comprehensively, this thesis adopts a structured format based on the compilation of two scientific articles. This approach offers a methodologically diverse examination of the topic. The first article, presented as Chapter 1, is a Systematic Literature Review (SLR) that establishes the theoretical foundations and synthesizes existing research on EU defense governance and the role of the EDA. The second article, Chapter 2, employs a mixed-methods study that combines a statistical analysis of GDP and defense expenditure relationships across the EU MS, and qualitative findings from expert interviews, to evaluate actual spending behavior among MS and the institutional dynamics that precede it. Together, these chapters provide a coherent and complementary analysis, offering both conceptual clarity and empirical evidence to support the findings and recommendations of the study. To further clarify the alignment between the research questions and the structure of the thesis, Table 1 below illustrates how each scientific article addresses the central research questions outlined earlier.

Table 1 - Research Questions Summary

Chapter	Research Question (RQ)
Chapter 1 - National Defense Expenditures and the Role of EDA: A Systematic Literature Review	<i>RQ1</i> : What is the role of the EDA in national defense expenditures?
Chapter 2 - Understanding National Defense Spending and Efficiency in the European Union: A Mixed Methods Study	<i>RQ2</i> : To what extent do defense expenditures differ across EU member states when measured as a percentage of GDP? <i>RQ3</i> : How does the European Defense Agency contribute to enhancing defense spending efficiency within the EU?

This work brings together two under-review articles: one systematic literature review and one mixed-methods empirical study, under a unified thesis structure. The organization of the dissertation reflects a logical progression from theoretical exploration to data-driven analysis, framed by a comprehensive introduction and a conclusive chapter. To provide transparency regarding the strategy of this research, Table 2 outlines the alignment of each article with the overall thesis structure and indicates the status of submission or publication. This information reflects the author's commitment to contribute to an academic publication in the field of defense studies through pending-review journal publication.

Table 2 - Strategy of Research and Publication

Chapter	Article Title	Type	Journal	Submission Status
Chapter 1	National Defense Expenditures and the Role of EDA: A Systematic Literature Review	Article: Systematic Literature Review	<i>Kyklos</i> (Scopus Q1)	Under Review
Chapter 2	Understanding National Defense Spending and Efficiency in the European Union: A Mixed Methods Study	Article: Mixed-Methods Empirical Study	<i>MICRADS</i>	Intention to submit in the next edition (2026)

In brief, this thesis examines a timely and pertinent interaction between national defense expenditures and the EDA. Furthermore, investigating this paradigm, enhances both academic knowledge and policy formulation in EDI. This dual methodological approach provides the necessary breadth and depth to explore the research questions in a coherent and structured manner. The findings aim to explore topics on strategic autonomy, institutional effectiveness, and the MS budgetary efficiency.

With this contextual foundation established, we now turn to Chapter 1, which presents a systematic review of the literature surrounding EU defense expenditures and the evolving role of the EDA.

CHAPTER 1 - NATIONAL DEFENSE EXPENDITURES AND THE ROLE OF EDA: A SYSTEMATIC LITERATURE REVIEW

Executive Summary¹

This first article creates a central component of this dissertation, due to its theoretical nature. The Russia-Ukraine conflict has shifted the geopolitical environment, leading to strategic debates on defense spending and cooperation in the context of the European Union. This study examines the role of the European Defense Agency and its influence in determining national defense expenditure patterns among member states. By conducting a systematic literature review, this article delves into recent academic contributions into European defense collaboration and procurement strategies. This study focuses on evolving defense dynamics, with a particular reference to Portugal.

Defense investment has expanded its recognition as a strategic instrument, beyond military concerns, that contributes to economic stability. The findings demonstrate that the EDA takes part in a critical role, by enabling joint capability development and supporting the implementation of initiatives such as PESCO and the European Defense Fund, facilitating the alignment between national and EU-level defense objectives. Through these mechanisms, the EDA acts as a central coordinating mechanism, promoting interoperability, and supporting more rationalized military investment.

This study emphasizes the intersection between defense policy and technological innovation, taking into account the importance of emerging technologies such as AI, cyberdefense, and autonomous systems, in redefining the operational scope of European defense. In this regard, the EDA is reasonably positioned not only as a facilitator of procurement efficiency but as a strategic enabler of innovation. Portugal serves as a relevant case within this framework, offering an example of how national defense strategies are shaped through institutional membership among the EU and NATO. The study finds that Portugal's alignment with EU defense patterns contributes broadly to its goals of defense collaboration and technological advancement. Although this research offers valuable

¹ This executive summary serves as an expanded version of the initial abstract, providing a understanding of the alignment among the two thesis articles. For citation guidance, refer to the APA standards. For chapter citation: Guedes, L., Simões, P., Reis, J. (2025). National Defense Expenditures and the Role of EDA: A Systematic Literature Review [Manuscript Under Review]. *Kyklos*. For thesis citation: Guedes, L. (2025). National Defense Expenditures and the Role of the European Defense Agency [Master's Dissertation]. Portuguese Military Academy.

contributions to theory and practice, it is not without limitations. Its reliance on secondary sources and the dynamic nature of defense policy limit its capacity for predictive analysis. Future research should focus on evaluating the economic impact of EU-level military investment, conducting case studies of specific EDA-backed or PESCO projects and seek to explore the integration of technological advancements into defense cooperation frameworks.

Finally, this study supports the EDA's essential role, positioning it as a key institution in the EU's response to current and emerging security challenges.

1.1. Introduction

Because of the Ukrainian crisis, geopolitical risks have increased dramatically and its influence on governments will be an ongoing time, not a complete one (Gao & Xu, 2024). Therefore, it becomes essential to understand not only how different countries, specifically Portugal, allocate resources to national defense but also how these decisions manifest within the dynamics of security, especially regarding cooperation among EU countries. Defense spending in Europe continues to rise, yet most European governments remain reluctant to invest more in defense research and development (R&D) (Fiott, 2019). Developing a defense policy that secures adequate funding for the armed forces presents substantial challenges when public awareness of the military's importance is insufficiently established, and societal trust in the capacity to ensure national security or meet international obligation such as those of the EU and NATO is lacking (Gómez-Trueba Santamaría et al., 2021). The concept of national defense serves as a guide for citizens to perceive it as a means of achieving national goals and interests, playing a fundamental role in a country's ability to protect its interests and its citizens' interests (Anissa Rehardiningtyas & Zakky Almubaroq, 2021).

As a full Member of institutions such as the EU, NATO and the international community, Portugal is in a privileged position to serve as a guarantor of Europe's energy security through the utilization and advancement of one of the liquefied natural gas entry points to the European continent. On the other hand, Portugal possesses a distinctive geostrategic position within the international arena, as it borders the Atlantic Ocean (EMPP, 2023). However, Portugal faces specific challenges whose understanding is crucial for the effectiveness of its defense strategies. Simultaneously, the European Union relies on the interconnection of its Member States and assumes the function of ensuring a collective approach to emerging threats since international collaboration can promote closer relations between countries (Wadjdi et al., 2023). In truth, no EU country should be isolated from the others, as there are connections that cannot be severed due to the EU's competitive strategies

(Minica & Sivulca, 2020). Furthermore, shifts in the global balance of power and the evolution of traditional and non-traditional threats highlight the importance of a cohesive and effective EU response to national defense issues. Collaboration is a constant feature of modern society and developing and implementing common defense strategies and policies are crucial to strengthening the EU's capacity to respond promptly and effectively to emerging threats (Berzina, 2020).

To ensure cooperation among its Member States and address challenges systematically and collectively, the EU operates through various organizations working together to achieve convincing results. In the realm of national defense, the European Defense Agency (EDA) supports and implements joint initiatives. The EDA emerges as a key entity in this dynamic, fostering cooperation and synergy among EU Member States in the field of defense. Consequently, the following sections of this article will address the relevance of national defense expenditures among EU Member States and explain EDA's role to contribute to a more integrated and efficient European approach.

By conducting a Systematic Literature Review (SLR), this article aims to study the role of the EDA in national defense. Therefore, the research question for this research is: "What is the role of the EDA in national defense expenditures?"

The remaining sections of this article are structured as follows: section 2 establishes a contextual foundation for the research, exploring national defense expenditures and the European defense industry. Section 3 outlines the process of methodology, explaining how the systematic review of the literature was conducted, namely the PRISMA and the method of content analysis. The fourth section is the discussion and analysis of the selected articles, highlighting the important findings. Finally, section 5 articulates the study's contributions to theory and practice, discusses the implications of the study, and concludes with recommendations for further research.

1.2. National Defense Expenditure

The comprehensive concept of national defense over time provides evidence of its highly dynamic nature, constantly adapting to evolving security challenges by incorporating new elements essential to national defense (Berzina, 2020). In this context, it is necessary to understand the importance of defense expenditures, study their evolution over time, and address the different components of this critical domain. Being a topic about political, economic, diplomatic, and global security factors, national defense expenditures can generate various socio-economic consequences, such as the misuse of public resources, risks

in international trade, and vulnerabilities to threats (Wang, 2023).

National defense should be viewed as a necessary preventive expenditure and a security policy. Budget-wise, the government decides the monetary allocation essential for each sector of the state, including national defense (Dudzeviciute et al., 2016). The state budget is a government administration document prepared in collaboration with ministries, containing a detailed forecast of state revenues and expenditures, and the concrete steps to be implemented during the coming year in various sectors such as education, health, tourism, and national defense (Parlamento, 2025). The governance area of national defense has the mission of formulating, directing, executing, and evaluating national defense policy within its competencies as defined by the National Defense Law. It also ensures and supervises the administration of the Armed Forces and other services, organizations, entities, and structures integrated within it (Defesa Nacional, 2025). These actions are identified in the National Defense Strategic Concept (CEDN). These measures play a crucial role in preventing potential aggressors, responding to internal crises, promoting global peace, ensuring the democratic normality society, communities, and they aim for legal compliance, economic growth, social balance, and political stability (Chiş-Manolache & Chiş, 2019).

However, national defense faces complex and evolving future challenges. The nature of threats is ever-changing, and defense plans always must adapt. Cyber war, hybrid war, and environmental threats pose new challenges that require new approaches to confronting them. Resource management is also a true challenge in that the modernization needs of the armed forces demand efficient utilization of economic, material, and human resources (Ackerman, 2006). These evolving defense challenges emphasize the greatest importance of economic stability since it has direct relations with the defense strength and resilience of a country. Defense capabilities and economic stability are closely based on making a country strong. The allocation of defense expenditure is depending upon the country's economic activity (GDP), hence the economic prosperity being an influential factor in sustaining and enhancing defense strength (Wibowo et al., 2020).

1.2.1. European Defense Industry

The defense sector is a pivotal mechanism of national sovereignty and international relations (Reis et al., 2022). In recent years, the global environment has become increasingly unstable due to emerging security threats and the intensification of competition among multiple power centers. With the return of war to European territory, the up-to-date environment of existential crisis within the European Union emphasizes on the importance for

better defense cooperation. With that, the EU maintains its fundamental values and common principles, and promotes its interests and main concerns. Expectedly, hard power, attested by modern, competent, well-equipped and ready-to-deploy armed forces, takes the lead over soft power. There were already undertaken preliminary steps to this direction, predominantly after the launch of the European Union Global Security (EUGS) in 2016, which emphasized the necessity of achieving progress in strategic autonomy, through the empowerment and further development of the European Defense Industry (EDI) (Tsagdis et al., 2023).

In response, states have increased defense budgets and adjust their strategic frameworks. However, the limitations of individual effort, particularly for smaller nations, have shifted the focus toward enhancing security, defense collaboration and integration. This approach offers benefits such as shared resources, more efficient procurement processes, collective resilience, and improved alignment of national strategies (Martill & Gebhard, 2023). Facing the form of conflict in Industry 4.0, defense forces can no longer trust exclusively on their defense equipment strength, but the competency development of the mutual defense by the Member states is the main point as the backbone of the defense sector (Wibowo et al., 2020). The EU and national governments could officially recognize the enhancement of Europe's defense-industrial capacity as a critical foundation for achieving key joint objectives (Aries et al., 2023).

There is potential to develop efficiency in the EU's defense industries through well-organized military alliances that provide advantages to their Members (Topcu & Aras, 2015). The European defense industry is a keystone of security, technological innovation, and industrial collaboration. Anchored in the European Union's strategic objectives, it operates within a framework shaped by the European Defense Agency (EDA) and the Permanent Structured Cooperation (PESCO). The role of the EDA is to promote the strategic and operational autonomy of the European Union, enabling an effective response to security threats and emerging crises. It acts as a catalyst for cooperation among Member States, facilitating the coordination of efforts in military equipment acquisition, defense capability development, and digital innovation (European Defense Agency, 2025). The EDA provides technical and administrative support to PESCO projects, particularly in capability development and the promotion of interoperability, aligning PESCO projects with the strategic priorities of the European Union as defined in the Annual Coordinated Defense Review (CARD) and the Capability Development Plan (CDP) (Blockmans & Crosson, 2021).

1.3. Materials and Methods

1.3.1. Search Process

A systematic literature review is an essential method for gathering information accurately and reliably by selecting articles that constitute empirical evidence meeting specific criteria and addressing defined research questions. Unlike other methods of literature analysis, a systematic review employs explicit techniques to enhance the reliability of the results (Page et al., 2021). Systematic reviews are challenging to keep up to date; however, they are crucial for ensuring the precision and utility of the content (Elliott et al., 2017). This method involves the clear definition of objectives to identify all eligible studies, assess the validity of the included results, and systematically synthesize the characteristics and findings of the studies conducted. The process of systematic literature review aims to identify relevant primary articles, extract data, analyze, and synthesize results to provide a broader and additional perspective on the investigated domain (Van Dinter et al., 2021).

This process follows these steps (Page et al., 2021): first, the objectives must be clearly defined; next, a systematic search is conducted to identify studies that meet the eligibility criteria; then, the validity of the included articles is assessed; and finally, the characteristics and findings of the included studies are presented.

1.3.2. PRISMA Protocol

The PRISMA methodology is widely recognized and crucial in many research fields. First introduced in 2009 and updated in 2020, PRISMA provides a detailed checklist of 27 items covering the essential elements of a systematic review, including objectives, data sources, search strategies, study selection, data extraction and synthesis methods (Page et al., 2021). According to Attaoui & Gaber (2024), this method applies a highly structured approach to identify, select, critically evaluate and synthesize relevant studies. The PRISMA method includes selecting the literature in four stages: identification, selection, eligibility, and inclusion (Mengist et al., 2020). These updates incorporated advancements in systematic review methodologies, directing emerging practices such as automation tools, the inclusion of self-assurance measures and heterogeneity assessments in evidence synthesis. The emphasis of the PRISMA on structured reporting is designed to improve the clarity and usability of systematic reviews for researchers (Hoffmann et al., 2021). For this research, a specific database was used, in order to improve transparency over a systematic literature review. The selected database was Scopus, the largest multifunctional database of peer-

reviewed literature, well-known for its trustworthiness, making it an indispensable tool for expediting the research process (Burnham, 2006).

The accompanying PRISMA flow diagram illustrates each phase of the systematic review process, from initial record identification to screening, eligibility evaluation, and final study inclusion. This visual representation not only improves understanding, but also allows for replication and evaluation of the systematic review's methodological rigor (Page et al., 2021). The selection method was divided in three phases: primarily, we found pertinent research by searching databases and academic journals, with the goal of compiling a thorough list of prospective studies, aiming to possess a wide range of material, relevant to the study question. Subsequently, a screening technique was used to rigorously examine titles and abstracts to determine their relevance to the research topic, acting as a filter, removing papers that are not relevant to the research objective. In this phase, the eligibility process was utilized to offer a thorough evaluation of the selected research based was performed on predetermined criteria. This entails examining entire texts to confirm compliance with designated inclusion criteria, including study design, publication date, principal conclusions, or other relevant features. The last and crucial step involves the selection of studies for inclusion in the systematic literature review (SLR). Irrefutable findings are made based on alignment with the research topic, the production of important insights and conformity to predefined criteria.

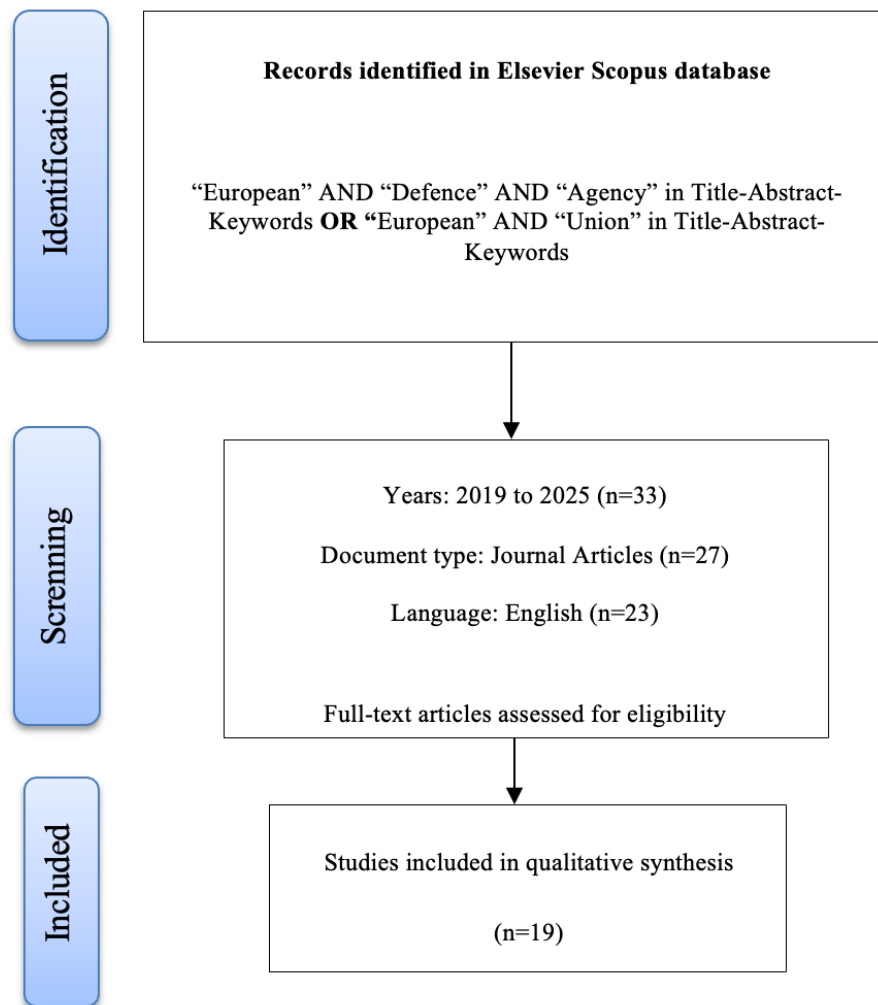


Figure 1 - Prisma Flowchart

During the screening step, the sample was narrowed to the years 2019-2025, with a focus on recent investigations (n=33). During this phase, only journal articles were selected (n= 27) and published in English, resulting in a total of 23 papers.

The advanced research was conducted on January 3, 2025 and all papers were thoroughly reviewed to ensure a rigorous and transparent selection process, aiming to enhance the reliability and reproducibility of the review by systematically evaluating the quality and relevance of the selected literature. The process was finished with 19 manuscripts included in qualitative synthesis, with no further articles added beyond those received from the Scopus database.

1.3.3. Data Extraction and Synthesis

Well-conducted systematic reviews seek to extract all data relevant to the review issue (Munn et al., 2014). Data extraction from Scopus, refined by the PRISMA protocol intend to summarize existing knowledge, and therefore contribute to relevant research, already existing on the topic. A synthesis of the results of relevant studies also allows for exploration of similarities or inconsistencies of the treatment effect in different studies (Aromataris & Pearson, 2014). Therefore, a content analysis was conducted to further enhance the depth of understanding.

The analysis of the 19 publications was carried out using five main steps: First, the papers were thoroughly reviewed and reread to gain a more in-depth comprehension of the topic. The title, author, publication year, nation, and key conclusions were all retrieved and entered in a spreadsheet. The data was analyzed to discover patterns and relationships, which resulted in the creation of an initial collection of themes. Themes were then revised to ensure that they matched the research objectives. Finally, the results from each theme were combined, considering the research question posed for this study. NVivo 12 has proven to be a vital tool in efficiently managing enormous qualitative data by lowering the time necessary for manual operations, improving flexibility and depth in data handling, and enabling a more thorough data analysis.

1.4. Results

The predominant themes in the 19 manuscripts reviewed, relate to defense spending, security policy, military-industrial technologies, and geopolitical dynamics. Authors examined dominant themes such as national security policies, defense collaboration, NATO and EU burden-sharing, and the economic impact of military spending. These investigations significantly contributed to the connection of defense investment and economic equilibrium, examining their effects on government policy, budgetary sustainability, and the international security framework. Geopolitical implications of defense expenditure are also referred to in the literature, more particularly the case of the Russian-Ukrainian war and changing European Union strategic stances. There is continued emphasis on political as well as ethical dimensions of defense policy, including the direct demand for transparency in defense expenditure. These studies considerably enhance comprehension of the evolving paradigms in military economics and security collaboration, emphasizing emerging trends and policy ramifications for sustainable defense tactics. Ethical considerations are obviously

highlighted, underscoring the necessity for judicious decision-making in the distribution of defense resources. Consequently, based on these results, we propose a conceptual framework for the analysis of defense investments (Figure 2).

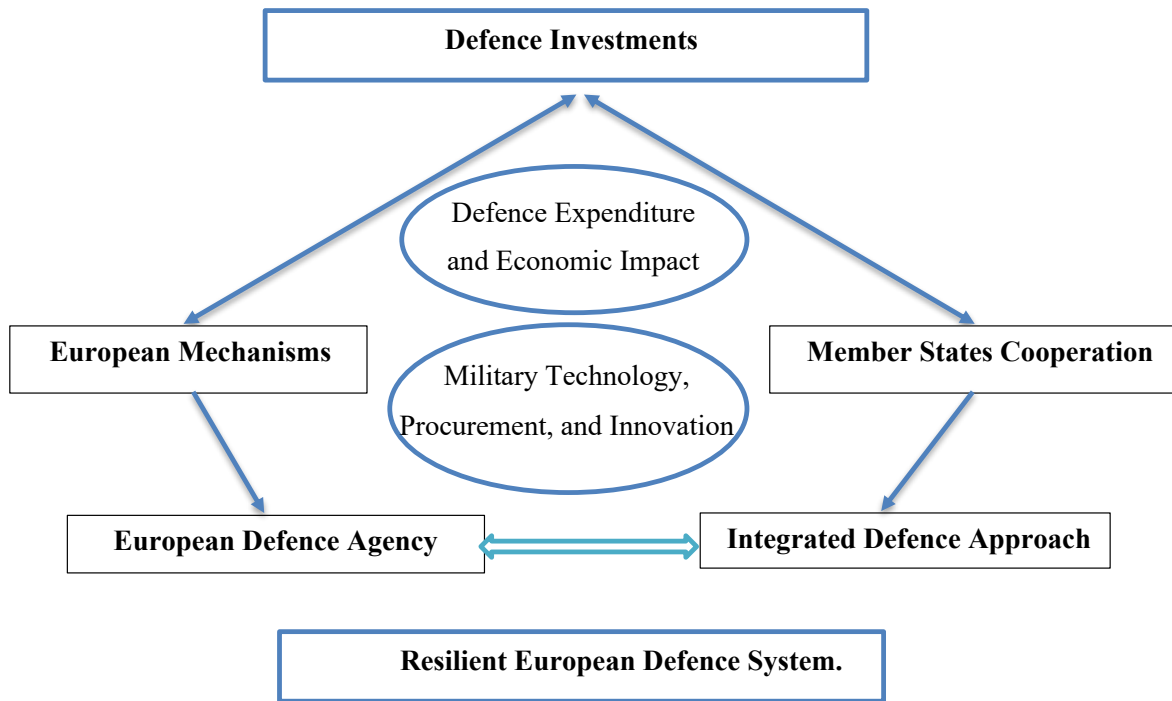


Figure 2 - Conceptual Framework for Joint Defense through the EDA

1.4.1. European Mechanisms and Member states Cooperation: A Path to a Resilient European Defense System

Defense investments are a fundamental part of European security and defense, having direct impacts on mechanisms and collaboration among Member states (Mader et al., 2024). Both aspects go hand in hand, promoting an increasingly collaborative and integrated Europe. The EDA plays an instrumental role in the process, guaranteeing the systematic allocation of investments to optimize military capabilities. The agency main goal is to promote an integrated defense approach, which coordinates national efforts into a coherent and efficient security system. This structured collaboration eventually leads to the creation of a strong European military system capable of handling today's security threats. By ensuring interoperability and reducing fragmentation, the goal is to ensure maximum spending on defense to pursue strategic objectives, enhancing the ability of Europe for

autonomous action while encouraging technological innovation and industrial development. The presence of a military-industrial complex is shown to benefit their participants (Eswaran, 2024). This collective endeavor is supplemented by the CSDP (Common Security and Defense Policy), which is designed to align national defense policies, optimize joint actions, and enhance the collective defense posture of Europe (European Union External Action, 2025).

Member states must work together to achieve maximum success. By taking part in joint military actions, sharing intelligence, and coordinating procurement policies, European nations strengthen their defense preparedness and operational consistency. Through European initiatives and mechanisms, Member states coordinate their strategic interests, ensuring the European Union's role as an international security actor. The European Defense Agency's (EDA) primary goal is defense strategy, which protects these activities by providing a structured framework for military cooperation aiming to a integrated defense approach.

There are two fundamental pillars that underpin this defense policy: defense expenditure and economic impact, along with military technology procurement and innovation. Defense expenditure is a main promoter of security and economic resilience, in which the resources are effectively distributed to develop cutting-edge military technologies (Bătușaru & Sbârcea, 2023). Each of these pillars are significant in the realization of the ultimate objective: the establishment of a robust and resilient European defense system.

Subsequent sections will discuss the effects of defense expenditure on economic stability and how technological advancements shape military acquisition, thereby illuminating how these aspects shape the course of European defense.

1.4.2. Defense Expenditure and Economic impact

Defense expenditures significantly impact national economies, affecting factors such as GDP growth, government debt, and general financial stability. The relationship between defense spending and European defense integration has garnered heightened scholarly and policy interest in recent years. While those expenditures influence economic stability and national budgets, they also play a crucial role in defining the collective security framework of the EU (Charlotte, 2024). Military investments are linked to economic growth via employment creation, technological improvements, and industrial development. Conversely, excessive defense expenditure can lead to fiscal imbalances, expanding national debt and reallocating resources from critical sectors like as healthcare, education, and infrastructure

(Iuga & Socol, 2023). The economic burden of defense spending, particularly in the context of the Russia and Ukraine war has a considerable influence on the economic performance of EU Member States, specifically for EU Members that rely heavily on Russian energy imports, having intensified the debate on how to reconcile national defense priorities with wider European security ambitions (Negri & Dincă, 2023). A study focusing on EU countries established that military spending has a positive impact on GDP in NATO-affiliated EU Member states (Iuga & Socol, 2023). Furthermore, research on small NATO-Member EU countries has shown that in certain nations, defense expenditure correlates negatively with government debt, while in others there is no meaningful relationship, suggesting that while some states manage to maintain sustainable fiscal policies increasing military investments, others struggle with the financial burden (Dudzevičiūtė et al., 2021). Meanwhile, the economic consequences of the Russia-Ukraine war have exacerbated budgetary pressures, leading to an increase in inflation, energy crises, and trade disruptions across the EU (Negri & Dincă, 2023). The ongoing conflict, the rising security threats and economic restraints has underscored to the EU, the necessity for strategic defense spending coordination among EU Member states to ensure both national security and economic stability.

The EDA plays a central role in facilitating joint procurement, research, and capability development among Member states, reducing redundancies and promoting cost-effective military investments (European Defense Agency, 2025). EDA acts as a technical and strategic enabler for the Permanent Structured Cooperation (PESCO) projects, enhancing cooperation among EU Member states, contributing to a joined and proficient approach to security. While NATO remains the key security supporter for numerous European states, the EU has made efforts to develop its own autonomous defense capabilities (Becker, 2021). The EDA, along with the European Defense Fund (EDF) and PESCO, aims to increase combined research, defense innovation, and cross-border cooperation. The challenge for EU policymakers is to synchronize national military budgets with overarching European security goals. Traditionally, defense burden-sharing across the EU has been disjointed, with nations opting for autonomous procurement policies instead of collaborating through integrated frameworks. However, the war in Ukraine has accelerated discussions on the need for a stronger European defense identity, reinforcing the importance of multilateral defense initiatives (Rodríguez Prieto, 2024). The European Peace Facility (EPF) and the EUMAM Ukraine training mission exemplify the EU's growing role in security and defense policy, but questions remain regarding the long-term sustainability of these efforts. The establishment of the Act in Support of Ammunition Production (ASAP) is one such

initiative aimed at increasing the EU's defense production capacity, particularly in response to the ongoing war in Ukraine (Fabbrini, 2024). However, while ASAP represents progress toward a more integrated defense industry, scholars argue that it falls short of the U.S. Defense Production Act, indicating that further measures are needed to achieve true defense industrial integration (Fabbrini, 2024). Evidence suggests that the war in Ukraine has led to a reversal in EU defense cooperation trends, with Member states increasing national military spending rather than prioritizing collective initiatives, highlighting the tightness between sovereign defense policies and the ambition for a unified European defense strategy (Mombelli, 2024).

An essential element in reconciling national military expenditures with EU defense collaboration is the enhancement of resources via collective procurement and research initiatives. The EDA and EDF offer a framework for reducing redundancy and inefficiencies, guaranteeing that military investments produce optimal strategic and economic advantages. Strengthening trust, interoperability, and financial commitments among Member states is essential for achieving a more coherent and resilient European defense system.

1.4.3. Military Technology, Procurement, and Innovation

The integration of emerging technologies, such as artificial intelligence (AI), drone warfare, and cyber capabilities is reinventing the environment of defense operations and procurement. Within the EU, the ambition for strategic autonomy has hardened the need for collaborative research and development (R&D) in defense technologies, aiming to strengthen the security, defense industry capabilities and synergies. The rapid advancement of military innovation has profoundly transformed defense strategy, placing considerable focus on dual-use technologies that cater to both civilian and military purposes. The European Drone Strategy 2.0, created by the European Commission, exemplifies this shift, emphasizing the EU's dedication to improving civil-military synergy in drone technology and seeking to enhance its security capabilities and stimulating industrial and economic growth by promoting advancements in unmanned aerial systems (UAS) (Lavallée & Martins, 2024). This initiative is consistent with broader trends in defense R&D, in which AI, automation, and robotics are becoming more incorporated into military operations. Furthermore, the quick development of 5G infrastructure, space-based defense systems, and next-generation military equipment has intensified global competition in high-tech defense sectors, highlighting the need of sustaining European competitiveness among emerging defense industries with the EU seeking to enhance its technological sovereignty (Dominese,

2019).

The EDA is vital in enabling cross-border defense innovation, encouraging interoperability, and certifying that Member states continue at the vanguard of military capabilities (European Defense Agency, 2025). One of the main areas where the agency has made noteworthy contributions is in mutual procurement initiatives, guaranteeing that Member states profit from economies of scale and interoperable defense systems. The ASAP was introduced to boost the EU's defense industry, particularly in response to the war in Ukraine. While this program is a step toward strengthening Europe's defense manufacturing, it does not yet provide the level of industrial coordination pretended. This gap highlights the need for more structured and long-term procurement strategies, particularly in emerging fields such as AI-powered warfare, cyber defense, and space security (Fabbrini, 2024).

Another significant issue in European defense procurement is burden-sharing and resource allocation. Both NATO and the EU encourage countries to not just spend more on defense, but to focus those spending on equipment modernization and shared operational requirements (Becker, 2021). While NATO and the EU support collective investment in military upgrading, national priorities often take precedence over supranational initiatives. Fragmentation inside the European defense industry remains one of the main challenges. EU's defense sector is divided among multiple national industries, each with its own priorities and procurement policies. This lack of standardization and interoperability often results in duplicated efforts and inefficient resource allocation, decreasing trust in the institutions of the defense sector (Sysoiev et al., 2024). The EDA has sought to bridge this gap by promoting multinational research projects and funding mechanisms like the EDF. These initiatives support the development of next-generation defense technologies, ensuring that Europe remains a competitive player in the global defense landscape, in order to achieve a more cohesive and effective defense policy (Fedorchak, 2021). While the EDA and EDF have expanded funding for military innovation, private sector participation in European defense initiatives remains low. Encouraging more public-private partnerships and creating an ecosystem in which entrepreneurs and academic institutions may contribute to defense technologies will be critical to sustaining Europe's strategic and technological lead.

1.5. Conclusions

1.5.1. Theoretical and Managerial Contributions

The shifting features of European defense collaboration and military expenditures

indicate an essential change in security policy, economic strategy, and technological advancement. This study focuses on aspects like joint procurement, defense collaboration between Member states, strategic autonomy and contributes to existing theory by analyzing the role of the European Defense Agency (EDA) in national defense expenditure.

Firstly, the research reports a crucial demand to recognize how defense spending encourages economic stability and military readiness within the EU. By conducting a SLR, we studied tendencies in defense investments, security policies and burden-sharing mechanisms. Additionally, the investigation emphasizes that defense expenditure is not simply a financial commitment, but it serves as a multifaceted policy instrument that influences national economies, industrial competitiveness and security integration. The transition from state-specific defense policies to more unified European strategies signify a fundamental change in the understanding of defense expenditure. Traditionally, military investments were mostly a matter of self-government, with each EU country establishing its own priorities. However, initiatives such as EDA, PESCO and the EDF are restructuring the system, promoting a more interdependent and cooperative framework, aligning nations interests and balance between national strategic autonomy and collective defense strategies. Furthermore, these programs present a lucrative strategy for military expenditure, minimizing duplication and guaranteeing the interoperability of defense systems among Member states, so enabling European nations to address emerging security challenges more efficiently. This study set out to answer the research question: “What is the role of the European Defense Agency in national defense expenditures?”. The findings demonstrate that EDA is vital in enhancing European defense cooperation and collaboration, in supporting military investments and fostering strategic autonomy within the EU. Through mechanisms such as the PESCO and the EDF, EDA facilitates effective military spending and encourages collective responses to emerging security threats. Likewise, by exploring the impact of geopolitical occurrences, predominantly the Russia-Ukraine war, this study contributes to the current debate on EU strategic autonomy and its evolving defense posture in relation to NATO and worldwide security alliances.

This study also underlines the relationship amongst national defense budgets and technological innovation, providing a thorough analysis of the EDA’s role, illustrating how it serves as a strategic enabler for multinational defense projects, resource optimization, and innovation-driven security solutions. The research offers a holistic understanding of European defense governance and emphasizes that defense R&D and military innovation are now central to EU security policy. The role of emerging technologies, including AI, drone

warfare, and cyber defense is expanding beyond national jurisdictions, requiring new strategic frameworks for investment, regulation, and operational coordination. This evolving defense paradigm is becoming crucial not only for European security policy but also for institutional decision-making.

1.5.2. Limitations and Future Research

This study offers significant insights on European defense expenditure, military procurement, and innovation, however, important limitations must be acknowledged. One key limitation lies in the scope of data sources used in this SLR, relying on secondary data, meaning it does not incorporate primary data collection from defense experts or policymakers, which could provide additional inputs. Despite attempts to secure a thorough array of studies, limitations concerning database access, keyword selection, and publication availability may have resulted in the exclusion of pertinent contributions. Additionally, as systematic reviews rely on existing literature, the findings are inherently dependent on the quality and timeliness of the included studies, introducing the potential for publication bias where studies with inconclusive or neutral findings may be underrepresented.

Another limitation relates to the changing nature of European defense policies and technological advancements. The defense sector is constantly shifting, influenced by geopolitical changes, economic variations, and new security challenges. Thus, this study offers a temporal overview, and certain insights may become obsolete as new EU military policies, procurement methods, and technology advancements arise. Variations in the quality and scope of included studies also pose challenges in ensuring the generalizability and robustness of the conclusions drawn. To address these limitations, future research should explore quantitative studies assessing the economic impact of EU joint defense investments, evaluating how collaborative military spending affects GDP growth, employment rates, and technological advancements.

Our study has shown some intriguing directions for future investigation. One important area for further investigation is the economic efficiency of joint defense investments, examining how initiatives like EDA, PESCO and EDF contribute to cost savings, military readiness, and strategic effectiveness. Moreover, future studies should investigate comparative analyses between EU and NATO defense strategies, evaluating how these institutions complement or compete in addressing European security challenges. Additionally, conducting case studies on specific PESCO and EDA-backed projects would help assess the real-world effectiveness of EU defense policies and strategic initiatives.

There is also a growing need to examine the role of emerging technologies in European defense policy. Subsequent research could focus on the impact of AI, cybersecurity measures, and autonomous weapon systems on military operations, decision-making processes, and ethical issues. Additionally, investigating private-sector involvement in defense innovation, including how the EDA and EDF can incentivize greater participation from the defense industry and technology firms would provide critical understandings into EU defense-industrial competitiveness.

Finally, the human dimension of European defense cooperation requires further exploration. Understanding how military personnel, policymakers, and leaders adjust to new defense frameworks, procurement regulations, and collaborative projects could facilitate institutional barriers and enablers of defense integration.

These research directions are essential for developing our comprehension of European defense, economic security, and technological evolution, ensuring that EU Member States remain prepared to face emerging security challenges while promoting a more resilient and cooperative defense system.

CHAPTER 2 – UNDERSTANDING NATIONAL DEFENSE SPENDING AND EFFICIENCY IN THE EUROPEAN UNION: A MIXED METHODS STUDY

Executive Summary²

Continuing from the first article, this second chapter investigates into the dynamics of defense investments in the context of the European Union, particularly how EU member states allocate their defense expenditures relative to their Gross Domestic Product and the European Defense Agency's role optimizing these investments. The importance of this research has grown in light of recent geopolitical events and the EU's institutional ambitions towards enhanced security. Consequently, the primary purpose of this study is to analyze defense spending across EU states and assess how the EDA contributes to the optimization and to the efficiency of these resources.

The article is structured as it follows: first, it introduces the research context, highlighting the central role of defense investment in European security; then, it defines the research methodology, which combines statistical analysis with qualitative semi-structured interviews; following, it presents the findings and categorizes them into key ideas related to defense cooperation, economic perspective and the role of the EDA; finally, it concludes with a synthesis of the results, offering both theoretical contributions and practical implications for EU defense context.

The methodology in this study assumes a mixed-methods approach, that integrates both qualitative and quantitative data. The quantitative section analyzes defense expenditure data from 2021 to 2023, focusing on the correlation between national defense expenditures and member states GDP. The qualitative component consists of semi-structured interviews with EDA's stakeholders, providing valuable considerations into the role of the EDA and the challenges that smaller EU states face in defense integration. This mixed approach allows for a comprehensive understanding of defense spending coordination.

The results of the study are characterized into three primary themes: strategic

² This executive summary serves as an expanded version of the initial abstract, providing a understanding of the alignment among the two thesis articles. For citation guidance, refer to the APA standards. For chapter citation: Guedes, L., Simões, P., Reis, J. (2025). Understanding National Defense Spending and Efficiency in the European Union: A Mixed Methods Study [Manuscript Under Review]. Defense and Peace Economics. For thesis citation: Guedes, L. (2025). National Defense Expenditures and the Role of the European Defense Agency [Master's Dissertation]. Portuguese Military Academy.

indicators for developing defense cooperation through the EDA, challenges faced by smaller EU member states with limited defense budgets and Portugal's strategic participation in EDA initiatives. The analysis conducted reveals that there is a significant variation in defense expenditure across the EU, reaching the conclusion that wealthier nations invest more in defense as a percentage of GDP. A strong correlation between these variables suggested the use of a regression model that allows for a better understanding between internal government prioritization and national defense expenditures. Interviews further demonstrate the EDA's role as an enabler of defense cooperation. Mechanisms like Permanent Structured Cooperation and the European Defense Fund are often highlighted as effective tools to improve interoperability and capability development. Additionally, this article contributed to the development of a conceptual framework for better understanding of how the EDA efficiently develops defense spending coordination. While the agency is constrained by national sovereignty, it remains a key actor, as it fosters collaboration among EU member states and facilitates joint procurement into long-term strategic frameworks for collective defense.

In conclusion, this article emphasizes the need for EU member states to align their defense budgets with both national security priorities and collective European objectives. It underscores the importance of cooperation between national governments, the EDA, and other stakeholders in strengthening the European Defense Technological and Industrial Base. The study offers practical recommendations for policymakers, particularly in improving the integration of defense procurement and technological innovation. Future research should focus on the impact of collaborative initiatives like PESCO and explore the EDA's relationship with other EU mechanisms, such as the European Peace Facility, in order to comprehend their role in shaping EU defense policy and strategic autonomy.

Keywords: European Defense Industry, military expenditures, economic growth, GDP

2.1. Introduction

In current world security, national defense expenditure has become a crucial component of state power and international stability. Economic growth affects military investments, but the distribution of defense resources is also determined by geopolitical tensions, security threats, and institutional frameworks, including those of the European Union (EU) (Kollias et al., 2018). Despite its significance, defense expenditure remains a topic of debate, particularly in terms of efficiency, burden-sharing, and strategic alignment

among EU member states.

The correlation between national defense expenditure and Gross Domestic Product (GDP) serves as a crucial measure of a nation's dedication to security. One of the most pertinent methodologies for its examination has been the “guns vs butter” hypothesis, which is typically employed as a simplification of national expenditure as a component of GDP (Jurado-Sanchez & Jimenez-Martin, 2014). While wealthier nations tend to allocate higher absolute amounts to defense, smaller economies may find restrictions that limit their military investments (Frederiksen & Looney, 1983).

Historically, EU defense policies have been fragmented, with national priorities often prevailing over collective security objectives (Erdağ, 2016). Since the Cold War, variations in economic capability, strategic cultures, and political will have continued to influence defense spending patterns, prompting inquiries over the efficiency of defense cooperative mechanisms (Dietl, 2003). The creation of the European Defense Agency (EDA) in 2004 marked an institutional attempt to promote coordination, enhance interoperability and optimize defense investments across EU member states. Moreover, the EDA's purpose in fostering collaborative defense activities necessitates examination to determine its effectiveness in achieving a more equitable and efficient distribution of resources within the EU. Despite substantial debate on defense expenditure in EU, few research has offered a thorough quantitative analysis correlating GDP, national defense budget, and EDA contributions, appearing to be no consensus about the effects of military spending on economic growth (J. P. Dunne & Tian, 2020). This gap in the literature shows the necessity to investigate how economic capability affects military expenditures and whether EDA measures result in more efficient expenditure patterns. This research identifies how important state military budgets are, and is guided by the following research questions:

RQ1: To what extent do defense expenditures differ across EU member states when measured as a percentage of GDP?

RQ2: How does the European Defense Agency contribute to enhancing defense spending efficiency within the EU?

To the best of our knowledge, the first research question is relevant, as this study focuses on investigate how EU member states allocate defense resources in proportion to their GDP. Furthermore, we identified the need to define a second research question to discuss a more focused topic and deepen the research, exploring in this context the role of the EDA in promoting coordination, efficiency, and shared capabilities in EU defense investment.

This study utilizes a mixed-methods approach, incorporating qualitative observations from semi-structured interviews alongside quantitative analysis of defense expenditure data obtained from the EDA. The following parts delineate the conceptual framework, methodological approach and empirical findings, offering a thorough analysis of defense expenditure trends and policy coordination in EU. This research enhances the discourse on military expenditures by providing valuable visions into the economic and strategic aspects of European defense policy.

2.2. Conceptual Background

This section provides an outline of the fundamental concepts regulating national military budget and policy cooperation in the European Union. It investigates the economic drivers of military investment, focusing on the relationship between defense expenditures and macroeconomic variables. It also investigates policy coordinating mechanisms in European security, with a particular focus on the role of the European EDA and other institutional frameworks. The study's goal in building this conceptual background is to contextualize the empirical examination of EU defense spending patterns and policy alignment. As a result, existing investigations are briefly covered in both theoretical and empirical reviews.

2.2.1. Economic Foundations of Military Investment

National military investment is inextricably related to a country's economic capabilities and overarching strategic goals. The relationship between a country's GDP and its military spending illustrates the degree to which economic power influences defense capability. The undetermined association between military spending and economic growth is due to differences in theoretical models, empirical techniques, countries, time periods studied, and data sources (Dunne & Tian, 2013). All of this may have fueled the ongoing study of the relationship between military spending and economic growth, as new methodologies provide new insights into the relationship between the two variables (Raifu & Aminu, 2023).

Traditional economic research on defense spending indicates the limits imposed on market processes, reflecting a Keynesian viewpoint in which state intervention was critical to resource allocation, particularly during wartime economies like World War II (Harrison, 1998). The Keynesian approach of economic thought promotes the notion that military

expenditure is merely a component of the state fiscal budget with the potential to have multiplier effects on the economy via multiple transmission channels (Chary & Singh, 2024), as its denoted on Figure 3, adapted from (Keynes, 1936). This method may assist an economy recover from a downturn and promote efficient demand growth (Paul Dunne, 2013).

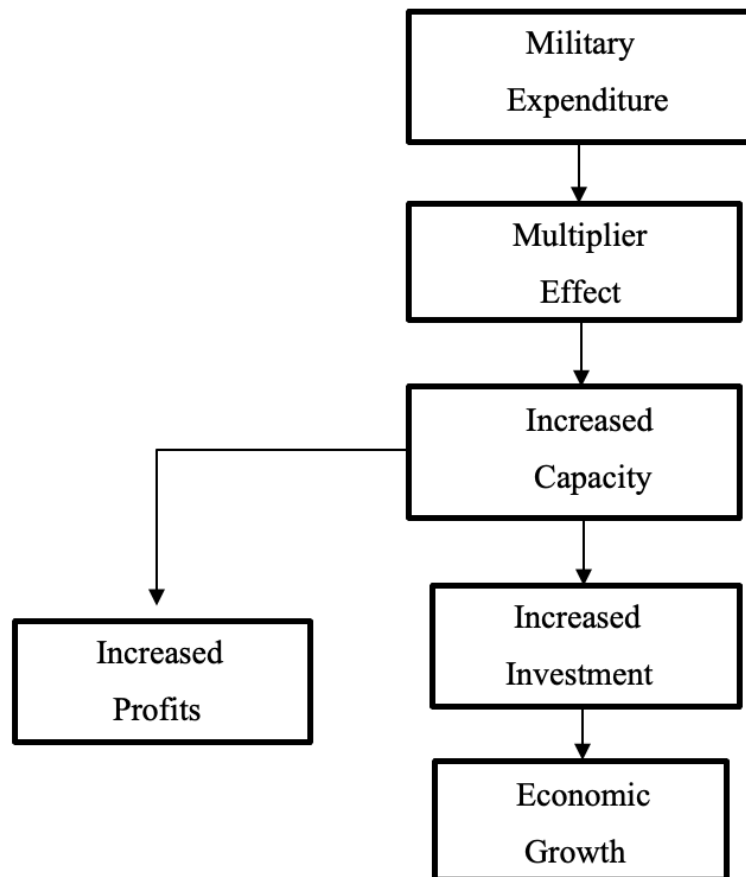


Figure 3 - Relationship between military expenditure and economic growth

According to the Keynesian theory, an increase in government expenditure stimulates aggregate demand and rapid economic development (Sánchez-Juárez & García-Almada, 2016). Still, the Keynesian approach to military spending has been criticized for ignoring the supply side of the equation and concentrating only on the military expenditure side (Frederiksen & Looney, 1983). As noted by Elveren et al (2023), empirical findings often fail to corroborate the Keynesian assumption of a consistently positive impact of military spending on economic growth.

Recent developments in political economy of military spending reveal that while

'guns vs. butter' is a well-known stereotype regarding policy trade-offs that governments must make, a multitude of political economy research has empirically shown that this trade-off is not as simple (Whitten & Williams, 2011). Over the past two decades, an increasing body of research has studied the economic implications of defense budgets across several estimation methods, examining both individual nations and groups of countries. A contentious topic in this regard is whether defense expenditure aids in diminishing national debt. This question is especially significant for smaller nations with constrained fiscal resources and relatively low real GDP per capita. The economic pressures resulting from the COVID-19 epidemic have intensified the significance of this discourse, as governments globally have seen diminishing or negative economic growth while concurrently sustaining or augmenting defense spending in reaction to external security challenges (Dudzevičiūtė et al., 2021). The effectiveness of national economies is closely linked to the role of governments in budget allocation and redistribution (Bataineh, 2012). In contexts where information regarding national security threats is unreliable, policymakers frequently allocate excessive defense expenditures, anticipating that decision-makers will prefer investments in military capabilities and defense strategies deemed most effective in alleviating worst-case security scenarios (Ben-Gad et al., 2020).

2.2.2. Policy Coordination in European Security

The European Union's approach to security and defense has historically been fractured, with national sovereignty concerns often taking precedence over collective efforts. The European Union, as an independent organization, consistently and financially supports the European Defense Industry (EDI) through a variety of projects. The Strategic Compass for Security and Defense has shown the necessity for improved situational awareness, intelligence-sharing, and operational coordination among Member States (Strategic Compass, 2024). One of the most relevant actions regarding the EDI, was the creation of the EDA, established in 2004, being nominated as the primary mechanism for assisting, overseeing, and coordinating the four key defense cooperation instruments: the Coordinated Annual Review on Defense (CARD), the Permanent Structured Cooperation (PESCO), the Capability Development Plan (CDP), and the European Defense Fund (EDF). The EDA's primary objective is to strengthen European defense capabilities and support the growth of European Security and Defense Policy (European Defense Agency, 2025). In this framework, the EDF is the principal funding mechanism, with a €8 billion budget for 2021-2027. This includes €5.3 billion for joint capability development programs and €2.7 billion

for collaborative defense research. The fund's goal is to reinforce collaborative defense research and development, promote a creative and competitive defense sector, and stimulate collaboration among industries and research institutions across the EU, regardless of size or location (European Commission, 2025).

According to Blockmans & Crosson (2021), since 2016, a permanent headquarters for military operations has been established, located within the European External Action Service (EEAS) in Brussels; the twenty-one Member States that are also NATO allies have pledged to increase defense spending to 2% of their GDP, with 20% of that sum established for investment in defense capabilities; and a CARD mechanism now monitors the implementation of commitments on defense spending and capabilities. PESCO was formally launched in December 2017, with a secretariat made up of the EDA, EEAS, and the EU Military Staff (EUMS) in charge of overseeing Member States' compliance with binding commitments and the implementation of capability development programs. A EDF of €8 billion has been agreed to promote the growth of military capabilities. Furthermore, recent policy developments have highlighted a "whole-of-government" strategy, bringing together civil and military assets in order to strengthen crisis response capacities. This is reflected in recommendations to improve the Emergency Response Coordination Centre (ERCC) as a central crisis hub, supporting the fast mobilization of security assets across many sectors (Niinistö, 2024).

The EU's shifting security landscape highlights the need for a strong framework that provides coherence between national and supranational defense policy while remaining flexible to address growing security issues in an extremely changing geopolitical environment (Erdağ, 2016).

2.3. Methodology

This study has followed a structured research approach, divided into three key phases: exploratory, analytical, and conclusive. This methodological framework provides a methodical and thorough inquiry, enabling the triangulation of qualitative and quantitative data to improve the trustworthiness and validity of the results (Kalu, 2017).

The exploratory stage consisted of planning and preparing to collect both qualitative and quantitative data. The qualitative part consisted of seven semi-structured interviews with key stakeholders in European defense policy which included some political decision makers, military officials and specialists in defense economics. Interviewees were chosen to capture the specific expertise and relevance to the topic of European defense cooperation. The

development of the interview protocol was based on a literature search and a review of policy documents to set the scope of the research (see Appendix B). The interviews were conducted online to ensure geographical diversity of participants. In this study, the results found in the responses show that the information gathered was consistent, attaining theoretical saturation. This idea refers to the point at which additional interviews no longer provide meaningful information and can find no further explanations or interpretation of information based on theoretical considerations (Bowen, 2008). As a result, the recurrent use of concepts in the responses indicates that the primary topics were fully investigated, reinforcing the depth and credibility of the data accumulated. Concurrently, the quantitative component is concentrated on the examination of defense expenditure data that is submitted annually by the European Defense Agency. The data was evaluated using the IBM SPSS statistics 30 software to conduct statistical analysis, covering descriptive statistics and regression models to discern patterns and connections (Meyers et al., 2017). For bivariate data, relationships between variables are explored through visualization tools such as scatter plots, complemented by correlation and linear regression techniques (King & Eckersley, 2019). These datasets include information on national defense spending GDP correlations and defense investments among EU member states. The EDA's reports offer a thorough and uniform analysis of defense expenditures, facilitating a comparative evaluation of military investment patterns among various nations. The statistical analysis was performed considering the available data, using the IBM SPSS statistics 30 software. Various descriptive statistical methods, either univariate techniques (graphical representation, measures of localization and dispersion) and bivariate techniques (correlation and linear regression) were considered to evaluate patterns of defense expenditure across EU Member States and assess the relationship between internal budgetary priorities and macroeconomic defense commitment (Ali et al., 2019). The study respected the principles of the Declaration of Helsinki, with subjects providing informed permission prior to its execution. Furthermore, confidentiality measures were implemented to protect the anonymity of respondents.

The analytical phase included processing and reviewing the data collected from interviews and EDA. The qualitative data from the semi-structured interviews were analyzed using content analysis techniques, in which data collected will lead to the formulation of ideas that are rooted in the evidence (Creswell, 2009). The transcripts were classified into themes and subthemes, using an inductive technique to discover patterns and emerging trends in European defense coordination. The MAXQDA software was used to analyze all the data collected, improving the efficiency and depth of the analysis (Kuckartz & Rädiker,

2019). This method enabled the discovery of repeating narratives on defense cooperation issues, funding allocation, and strategic priorities among EU member states. The quantitative study used EDA data to find patterns and connections in national defense expenditure. Descriptive statistical approaches were used to examine changes in defense expenditures and cooperation levels over time. This study seeks to present a comprehensive and data-driven view of policy coordination in European security by combining qualitative insights from expert interviews with quantitative trends from EDA findings.

The final stage involved interpreting the results, evaluating their ramifications, and developing policy suggestions. The findings were contextualized within the larger framework of European security policy, highlighting major drivers of military spending and collaboration. This stage also included a reflection on the study's limitations, particularly regarding data availability and potential biases in expert interviews.

By employing a mixed methods approach that combines qualitative interviews with quantitative defense expenditure analysis, this study contributes to the academic discourse on European security policy (Teddlie & Tashakkori, 2010). The triangulation of data sources strengthens the research, resulting in a well-rounded and empirically supported evaluation of policy coordination in European defense.

Table 3 presents a brief summary of the methodology section, providing an understandable visual representation of the complete study process. This work is organized around two complimentary methodologies: qualitative content analysis of expert interviews and quantitative analysis of EDA reports, as seen in Table 3. This mixed-method approach enhances the findings by integrating statistical information with expert perspectives, alleviating the constraints inherent in using either method independently and offering a more thorough comprehension of military spending and cooperation dynamics within the EU.

Table 3 - Summary of the methodology

Mixed-Method Approach		
Methodology	Mixed	
Research Strategy	Mixed-Method	Semi-structured interviews
Approach	Document analysis	
	Statistical analysis	Policy documents
Sources of data collection	EDA database	
	Official EU reports	Content analysis
Data analysis techniques	Descriptive statistics	
	Regression analysis (SPSS)	

2.4. Results and Discussion

As mentioned before, the analysis and the discussion of the results include two phases, a quantitative and a qualitative, to answer the research questions and, at the same time, fill the gap in the literature.

In our study, a total of seven stakeholders from the EDA were interviewed, comprising one female and six male participants. The sample included both military personnel and individuals with prior or current affiliations with the EDA. This distribution provides a balanced view, with perspectives from participants with different levels of experience and different positions within the military hierarchy or EDA structure.

The results reveal categories related to the European defense framework. The analysis of the conducted interviews identified three core categories: strategic indicators for strengthening defense cooperation through EDA, challenges and opportunities for states with smaller budgets in European defense and Portugal's strategic participation in EDA initiatives. The participants emphasized that mechanisms such as PESCO, EDF, and CARD provide effective options for improving interoperability and collaborative capability development. However, considerable challenges were highlighted, such as structural and financial limitations for smaller member states in defense integration. The following sections provide a description of the results obtained in the investigation.

The interview analysis yielded interesting results regarding the primary topics of

European defense cooperation and defense spending. The answers were highly consistent, showing theoretical saturation, as participants held similar viewpoints on the role of EDA and the issues encountered by smaller EU member states. Structured debate around these issues allows for a methodical evaluation of stakeholder perceptions, showing both opportunities and constraints within the existing defensive structure. The subsequent sections provide a comprehensive analysis of these findings and their ramifications for defense policy cooperation within the EU.

2.4.1. The qualitative findings

This section presents the qualitative results obtained through semi-structured interviews conducted with key defense stakeholders within the EU. The goal was to study perceptions, experiences and gain strategic insights regarding the role of the EDA particularly in enhancing capability development among EU MS. Hence, key thematic areas were identified, offering key understanding of challenges, opportunities and dynamics, with a specific focus on Portugal's engagement within European institutional frameworks.

2.4.1.1 Strategic Indicators

The participants underlined the importance of strengthening defense cooperation and capability harmonization within the European framework, based on the key indicators found in the interviews. A central theme debated was the need to strengthen decision-making processes in order to enable better coordinated and efficient responses to security concerns. The interviewees reinforce a basic knowledge of the EDA as an intergovernmental institution. This definition is critical because it indicates that the agency's financial resources and strategic direction are inextricably linked to the collective desire of its member states, as directed principally through their distinct Ministries of Defense, which serve as the primary stakeholders. On top of that, some factors highlighted were the importance of interoperability and standardization in military operations, as these factors facilitate cohesive collaboration across nations. They emphasized the necessity for augmented defense expenditures and the efficient use of resources to sustain operational readiness. Likewise, cooperative frameworks and policy alignment were recognized as critical components in promoting sustained collaboration and ensuring that defense expenditures are allocated to strategic priorities. The understandings obtained indicate the importance of aligning capabilities and making use of EU structures to strengthen collective security initiatives.

A theoretical conceptual model (Figure 4) has been constructed on the basis of the key concepts and the most common ideas of the interviewees, which allows us to verify the indicators and establish relationships between the main concepts. This model allows us to identify patterns and verify that by cooperating and aligning their defense policies towards common goals through European mechanisms, including the EDA, Member States are able to maximise their benefits, harmonise capabilities and optimize defense investments.

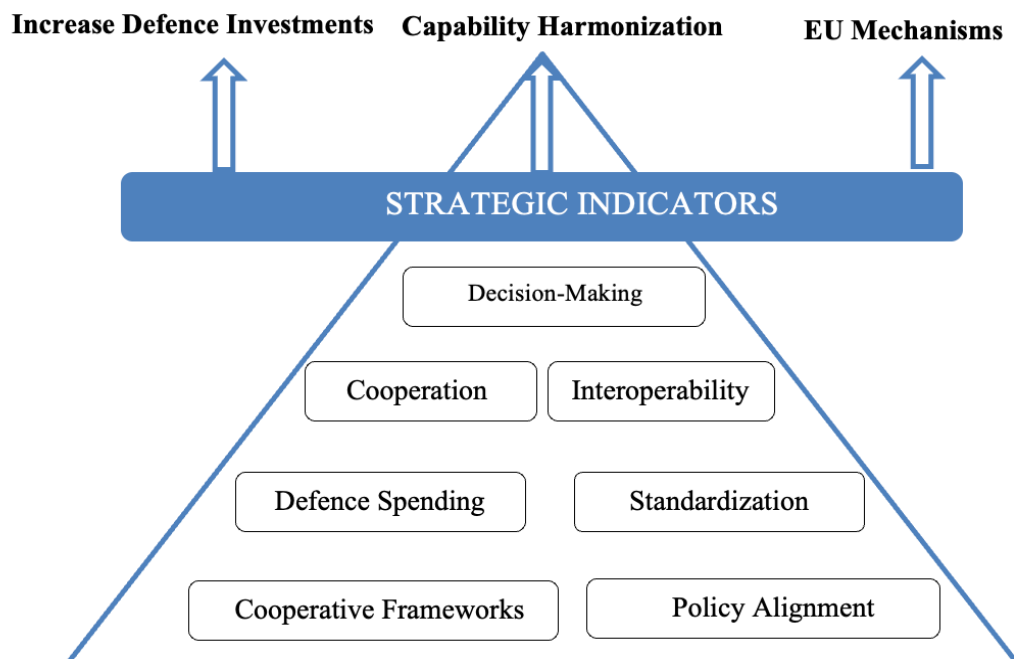


Figure 4 - Strategic Indicators for Strengthening the EDA as Europe's Defense Pillar

At the base of the conceptual model are key components such as decision-making, cooperation, interoperability, defense spending, standardization, cooperative frameworks and policy alignment. These elements were consistently emphasized by interviewees as critical factors for achieving a more effective and integrated European defense environment.

This model reflects how the simple effect of these indicators facilitates strategic outcomes, specifically: increased defense investments, capability harmonization among member states, and the effective use of European Union mechanisms such as CARD, PESCO, and the EDF. The arrows linking the foundational indicators to the higher strategic objectives represent the essential upward progression of development, as operational enhancements at the member state level progressively advance overarching European goals.

However, the strategic indicators not only represent independent areas for

improvement in defense, but are interconnected factors that strengthen each other. Decision-making and cooperation, for instance, lead to better interoperability and standardization, which contributes to a more efficient defense spending and deeper alignment of national and European policies. Advancing in these domains is essential for the EDA to effectively serve as a facilitator of multinational collaboration and a catalyst for a more cohesive, capable and independent European defense framework.

2.4.1.2 Challenges and Opportunities for Member States in European Defense Cooperation

Regarding the challenges that may occur in the complex environment faced by EU Member States, or the opportunities that can emerge in this context, the analysis of interview data appointed some key aspects that we should consider. Constraints on defense budgets, coupled with institutional fragmentation and the imperative need of strategic prioritization are key challenges. Meanwhile, frameworks provided by the EDA and associated initiatives, including CARD, PESCO and the EDF, provide opportunities for smaller states to reduce weaknesses and improve their strategic posture.

EU member states with smaller defense budgets, such as Portugal, face challenges when aligning their defense expenditures with EDA recommendations. One of the primary difficulties is the financial constraint that limits their ability to invest in the full range of defense capabilities outlined in EDA's guidelines, especially when trying to meet both national security needs and the strategic priorities of the EU and NATO. These Member States can maximize their participation in EU defense projects by strategically focusing on multinational cooperation, leveraging EU funding mechanisms, and prioritizing key areas where they can contribute effectively while sharing the financial burden with other member states. Another identified challenge is strategic planning. According to Teixeira & Pinto Dos Santos (2014), member states that have different approaches regarding international cooperation in defense industrial initiatives due to its strategic geographical position, such as Portugal, must be highly selective in their defense priorities and have to choose the specific areas where they want to be present and allocate the budget for this, knowing that with cooperation they can optimize. They may encounter political and public resistance to increasing defense spending, particularly if the benefits of aligning with EDA recommendations are not immediately visible to the public, and that's why there is the need to assess and select carefully the best projects, that address both their national needs and as well the European requests. The interviews also emphasized the need to allocate human

resources with the skills to plan a strategy, to support them so that they can optimize an analysis of the tools that exist, compare them with national interests and derive added value for the country and for the Portuguese industrial fabric in support of the national strategy and national interests. The interviews also stressed the importance of aligning Military Programming Laws (MPLs) with EDA recommendations, as well as improving interoperability and standardization across member states. The emphasis on joint planning and harmonized policy frameworks was repeatedly mentioned as a precondition for the long-term success of European defense integration. Strategically, the way forward is consolidating responsibility-sharing among member states, deepening institutional dialogue, and building trust through successful cooperation projects. European leaders will have to more clearly delineate the security priorities and ensure that all states, regardless of size, can play a useful role.

Hence, defense budget constraints in Portugal or in countries with smaller budgets, can be mitigated by focusing on cost-effective initiatives, such as shared training programs, standardization efforts, and joint exercises. These initiatives will allow Portugal to improve its defense capabilities while ensuring that resources are used efficiently.

2.4.1.3 Portugal's Strategic Participation in EDA Initiatives

Portugal stands out among smaller EU member states as a strategic and proactive participant in EDA initiatives. The country has leveraged European defense frameworks to address national capability gaps and to establish itself as a reliable partner within the EU defense environment.

Portugal has benefitted from several programs that were started in EDA. The best known is the Multinational Helicopter Training Programme (MHTC), which started initially in 2009 and was derived from a capability gap that was identified. Initially was called Helicopter Exercise Programme, which brought together helicopter crews from several MS, and after achieving a well mature state, was delivered in 2019 to Portugal and is running nowadays in Sintra Air Base. The MHTC demonstrates Portugal's ability to lead high-impact projects that enhance operational readiness and interoperability and is an excellent example of how capabilities gaps were transformed in projects and how helicopter crews boost their knowledge and capability in challenging tactical environments. This initiative has provided advanced training opportunities not only for portuguese forces but also for other member states, at a reduced financial cost due to shared resources.

Portugal's leadership also extends to the cyber domain, where the EU Cyber

Academia and Innovation Hub (EU CAIH) was established in collaboration with NATO's Communications and Information Agency in Oeiras. Portugal's contributions to PESCO projects, such as MUSAS (focused on maritime unmanned systems) and AMIDA (focused on damage assessment in urban contexts), demonstrate the country's expanding importance in capability development and technological innovation within the EU. Furthermore, Portugal has taken advantage of collaborative procurement programs, such as the joint acquisition of 155mm artillery munitions and satellite communications, reflecting a cost-effective strategy for maintaining and enhancing defense capabilities. These efforts demonstrate how a smaller country can effectively use EU structures to offset national limitations and simultaneously increase its relevance in collective security matters.

Interviewees consistently referred that the onus is on the Member States. From the effective integration of collective defense initiatives, it forces them to find points and the possibility of negotiation, compromise and working together. In other words, it promotes the defense industry itself. Portugal's successful participation and strategic use of EDA frameworks should be maintained and strengthened, as continued engagement in these initiatives represents a critical path toward enhancing national capabilities and reinforcing its role within the EU's collective approach. Therefore, the MS need to understand that they need to work together and increase the investment in defense. This means to invest more, invest faster and invest together in EU defense, addressing the most urgent needs.

2.4.2. The quantitative findings

In this section, we present the quantitative analysis based on defense expenditure data from the EDA website between 2021 and 2023. Using descriptive statistics through bivariate techniques, the analysis has the purpose of evaluating how EU MS allocate their defense funds in relation to their GDP and government budgets. The results include graphical representations and correlation-regression techniques to identify spending patterns and to understand the connection between internal budget prioritization and defense commitment.

2.4.2.1 Member States Defense Investments

In response to changes in Europe's security situation, the Member States (MS) must adapt to new risks and actors, be more flexible and respond better to partner's expectations, in order to be more effective facing hybrid threats such as foreign intervention, cyber-attacks and information manipulation. As a result of Member States efforts to strengthen their armed

forces' fighting capabilities, total defense expenditure witnessed a sharp increase in the past few years. Defense spending by the 27 MS grew by 10% in real terms for the ninth straight year, reaching €279 billion in 2023. Defense expenditure accounted for 1.6% of GDP, up from 1.5% in 2022. According to the 2024 Coordinated Annual Review on Defense (CARD) study, the increase in spending is expected to continue in the future years, with figures indicating that overall defense expenditure might reach €326 billion in 2024. This translates to an estimated 1.9% of MS GDP, bringing MS closer to NATO's 2% GDP target.

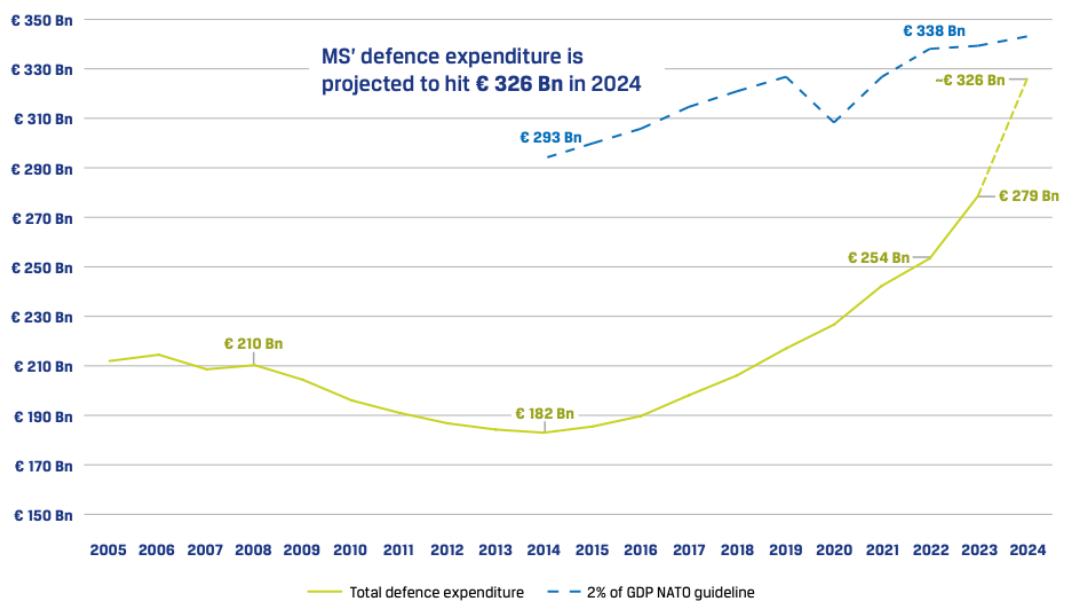


Figure 5 - Total Defense Expenditure vs the 2 % of GDP NATO guideline

However, as shown in Figure 3, adapted from European Defense Agency (2025), the 2% GDP benchmark hasn't been met yet, and in the current environment, this effort must be reinforced. While worries about rising living costs and access to health care, education dominate the political agendas of all EU Member States, it is their responsibility to emphasize that security is an essential requirement for all these problems. The MS need to strengthen social support for security and defense (Strategic Compass for Security and Defense, 2024). EU MS must also invest considerably more collectively in a coordinated manner for the purpose of addressing gaps and minimizing wasteful actions.

Currently, the percentage of defense funds that MS spend jointly or utilize to purchase European equipment is far too low. To replace inventories, fortify readiness and maintain support for Ukraine, MS must rapidly build defense capabilities at scale.

Through the European Defense Agency, EU MS must purchase ammunition together. The Capability, Armament & Planning Directorate (CAP) Directorate supports the coherent development of the European defense landscape by integrating EDA's participation in the Capability Development Plan (CDP), the CARD and the PESCO (European Defense Agency, 2025). CAP discovers, plans, and proposes collaborative possibilities to support EU capability development priorities that are customized to Member States' needs, demonstrating a consistent approach from priority formulation to impact. The directorate is in charge of developing the CDP, which is based on a study of military requirements undertaken in collaboration with Member States. It also defines output-oriented EU capability development goals and oversees the creation of Strategic Context Cases to support their implementation (European Defense Agency, 2025). This approach should be extended to other types of equipment as well, like technological devices, investing more significantly. The European Defense Industry Strategy will help to strengthen Europe's defense technical and industrial foundation. There are already mechanisms to accomplish this through the EDA and the EDF, but a persistently need to speed up and expand this movement. In this area, European cooperation should become the pattern: set aggressive expenditure targets for R&D and competencies build together. Capability Technology Areas (CapTechs) are specialized entities created by the EDA to perform research and development activities targeting specific defense capability requirements. CapTechs are essential in promoting innovation and enhancing defense technology throughout Europe by detecting technological deficiencies and shared interests among EDA member nations (idD Portugal Defense, 2025). Participation in CapTechs is available to governmental agencies, research institutions, industries (including small and medium-sized enterprises), and universities. Participating in CapTechs allows individuals to impact and contribute to the advancement of military capabilities at the European level. It also allows for the growth of professional networks with important defense stakeholders, creating the framework for integration and partnerships aiming to gain European financing, such as the EDF. Member States not only need to spend more, but must spend better together. This measures will also boost NATO, noticing that collaboration is more important than ever, but at the same time, MS must be able to provide our own protection and defense (Strategic Compass for Security and Defense, 2024).

The EU is implementing a substantial endeavor to improve its defense capabilities via a thorough budgetary and strategic framework. This project aims to raise up to €800 billion to empower Member States to increase investments in military capabilities. A crucial element of this strategy includes the reduction of fiscal restrictions, specifically via the

provisional suspension of the 3% deficit cap, thus generating a fiscal capacity of roughly €650 billion over four years. Another significant element in this framework is the allocation of €150 billion in loans exclusively for military investments. This financial assistance is meant to help modernize and expand defense infrastructures, as well as to encourage cooperative buying of military equipment. By supporting coordinated acquisitions, the effort hopes to improve interoperability across European armed forces, decrease inefficiencies, and enhance the continent's military sector. The primary goal of this project is to ensure that EU Member States invest at least 1.5% of the Union's GDP in defense. This commitment is part of a larger effort to strengthen Europe's strategic autonomy and operational readiness, facing the growing of security threats (European Commission, 2025).

The European Commission underscores the necessity of assisting nations in their readiness for European Union. Moreover, enhancing the visibility of EU-funded projects is crucial for illustrating their influence. Enhancing collaboration with foreign partners will be supported by the EU's global network of representatives, ensuring a unified strategy for enlargement and regional development (U. von der Leyen, 2024).

2.4.2.2. Defense Expenditures and Economic Perspective

According to the data collected from the EDA datasets, the goal is to present a quantitative analysis of defense investments across EU member states between 2021 and 2023, to show how these investments varied along the years, with a specific focus on their proportion relative to their GDP, taking into account the data gathered from the EDA's annual defense expenditure reports. The main purpose is to assess how much each member state invests in in proportion to its overall economic resources, as well as to gain relevant conclusions to understand the overall resource allocation patterns within the EU system.

The highest levels of spending were consistently recorded by France, Germany and Italy. The military spending rates of these three countries were consistently high, reflecting the status of each as major European powers with enhanced strategic burdens, large military infrastructures and actively involved global functions. Several smaller economies displayed relatively low absolute investments but still made proportionally significant efforts when adjusted to GDP. Portugal represents a notable case. Despite a smaller defense investment in absolute terms compared to larger economies, it steadily increased its investment from €533 million in 2021 to nearly €865 million in 2023 (see Appendix C). This development indicates a steady, yet distinct enhancement of national defense policy, consistent with fundamental EU recommendations. The descriptive statistics indicate that the mean defense

expenditure as a percentage of GDP among member states was 1,62%, with a standard deviation of 0,71, pointing to moderate variation in proportional spending levels. When measured as a percentage of government expenditure, the mean value was 3,70%, further demonstrating the degree to which governments prioritize defense relative to their total budget.

The boxplot representing Total Defense Expenditure as a % of GDP (Figure 6), provides a visual interpretation of expenditures dispersion across the EU. Minimum and maximum values correspond closely to the interquartile range, suggesting limited dispersion within the dataset. However, no formal outliers are identified. This graphic indicates that most countries are located nearby the median value (1,57%), with countries such as Poland and Greece reporting noticeably higher defense expenditures relative to GDP when compared to the majority of MS.

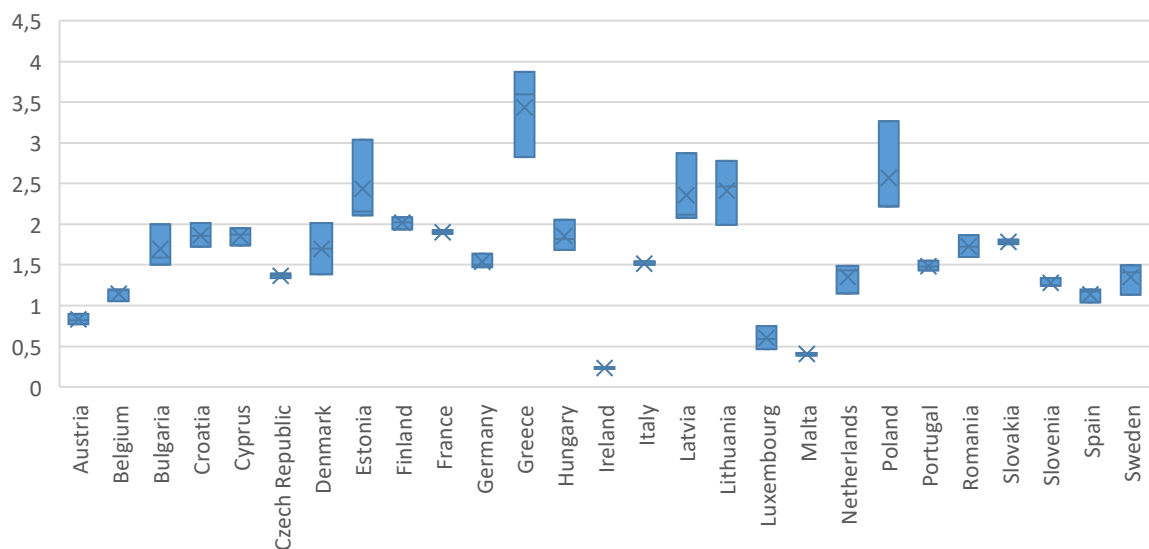


Figure 6 - Boxplot of Total Defense Expenditure as % of GDP by EU MS

Each point on the X-axis corresponds to the three-year average of each country's defense expenditure, thus reducing the influence of short-term annual fluctuations and offering a more reliable comparative perspective. For example, Portugal reported an average defense expenditure of approximately 1,5% of GDP over the period in question. This places Portugal below the EU median, suggesting a moderate but relatively conservative investment in defense.

Figure 5 presents a simple line graph showing the annual evolution of defense

expenditure as a percentage of GDP between 2021 and 2023. While the short time span limits the possibility of establishing statistical trends, the graphical representation allows for a retrospective observation of how defense spending developed over these three years. Several MS, including Portugal, show a gradual increase, which may reflect shifting priorities in response to the ongoing conflict in Ukraine and the broader focus on collective defense within the EU.

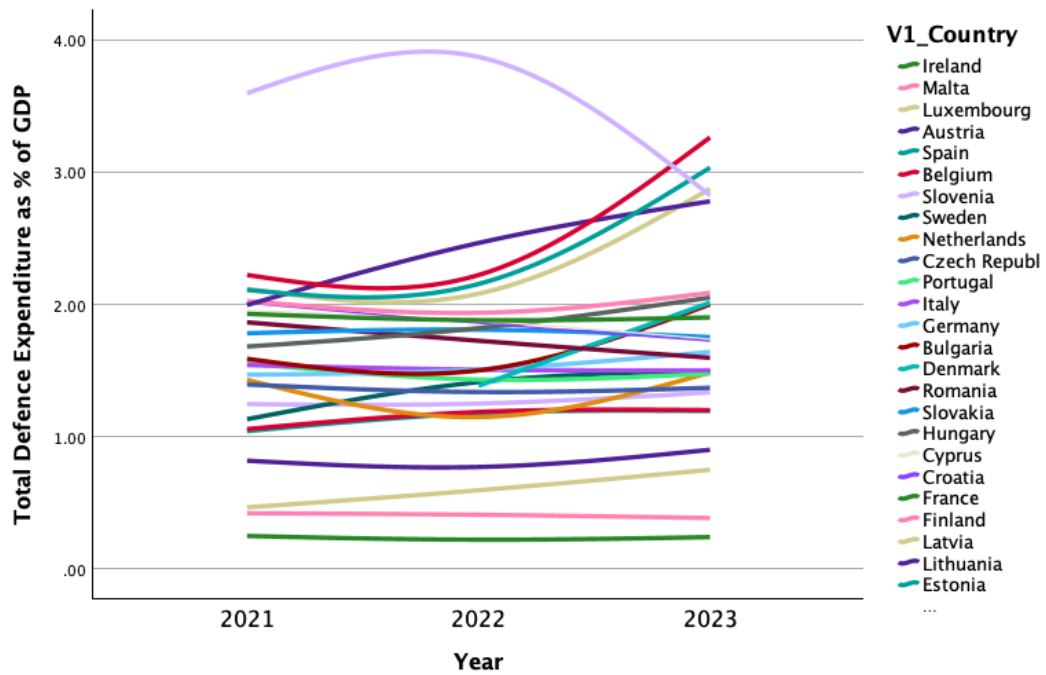


Figure 7 - Evolution of TDE as % of GDP in EU Member States

As mentioned earlier, this graphic evolution offers a dynamic view that allows to analyze each country's expenditure path from 2021 to 2023. The line graph allows the evaluation of developments in defense, whether that budgets have been on an increasing, decreasing or flat. There are several dynamics of concern that can be identified from this evaluation. If we look over the evolution represented on Figure 5, it shows that most member states increased their defense spending as a percentage of GDP, but at different levels. The fact that the European security environment has become volatile since the invasion of the Ukraine, it caused an upward investment trend to answer the demands for strategic autonomy in the EU.

Regarding statistical relationship between defense expenditure indicators, a Pearson correlation analysis (see Appendix D) was first conducted to determine the strength and

direction of the linear association between TDE as a percentage of government expenditure (independent variable, X) and TDE as a percentage of GDP (dependent variable, Y). The result of the Pearson Correlation yielded a very strong and statistically significant positive correlation ($r = 0.938$, $p < 0.001$), which justifies the application of a linear regression model for further analysis. Based on this strong correlation ($|r| > 0.7$), a simple linear regression model (see Appendix E) between these two variables was estimated to examine how the independent variable (X) could explain variation in the dependent variable (Y).

The resulting regression equation is: $\hat{Y} = 0.197 + 0.386X$. With these results, we can conclude that the standardized beta coefficient is statistically significant ($p < 0.001$) and that the model demonstrates a strong linear relationship between the two variables (Gaddis & Gaddis, 1990). The unstandardized coefficient ($B = 0.386$) implies that for every one percentage point increase in defense expenditure as a proportion of government expenditure, there is an expected increase of 0.386 percentage points in its share of GDP. The standardized beta coefficient ($\beta = 0.938$) reflects the strength of the predictor's effect in the model, confirming that defense spending as a share of government expenditure is a strong determinant of its proportion relative to GDP.³ The constant (intercept) is 0.197, and the standard error of the estimate is 0.244, suggesting a good fit of the model to the data. In practical terms, this result shows that countries which prioritize defense in their internal budgets, tend to reflect that priority more clearly at the macroeconomic level, reinforcing the idea that political commitment is a key driver of proportional defense investment.

According to Hazra & Gogtay (2016), the coefficient of determination, known as R-squared, indicates how well the independent variable explains the variability of the dependent variable in a regression model. When R-squared is close to 1, it means that a large proportion of the variation in the dependent variable (Y) can be predicted based on the independent variable (X), which means that the model has a strong fit to the data. The R-squared value is 0.88, that reveals a very strong and statistically significant relationship, meaning that 88% of the variation in defense expenditure as a percentage of GDP is

³ The p-value indicates the probability that the observed correlation occurred by chance. A p-value lower than 0.001 suggests the result is highly statistically significant.

The unstandardized coefficient (B) represents the expected change in the dependent variable for a one-unit increase in the independent variable, expressed in original units.

The standardized beta coefficient (β) indicates the strength of the relationship between variables in standardized units, allowing comparison across models regardless of scale.

explained by changes in its share of government expenditure, and implying that the MS that allocate a wider proportion of their government budgets to defense, are also likely to have higher defense spending relative to their GDP. This reveals a strong connection between the priorities set in national budgets and the resulting macroeconomic outcomes, implying that defense spending should not be viewed as a residual category, but as a deliberate policy choice subject to strategic, geopolitical, and institutional commitments.

2.4.2.3. Defense Spending Trends: NATO vs Non-NATO EU Member States

In response to expanding geopolitical concerns, including the invasion of Ukraine, the EU has increasingly acknowledged the necessity to enhance its defense capabilities. While historically the EU has depended on NATO as the foundation of collective defense inside its framework, in recent years there has been a growing need for greater strategic autonomy and more defense integration within the EU (Howorth, 2017). The divergence in spending patterns reflects the differences represented in strategic planning, and institutional activities of the EU MS. Some countries have aligned their defense goals and strategies towards NATO and EU recommendations, but there are others that are reluctant in their defense expenditures due to budget constraints.

The line graph below (Figure 6) illustrates the average TDE as % of GDP over the three-year term 2021-2023, divided into three different groups: all EU27 members, EU members who are NATO members, and EU members who are not members of NATO.

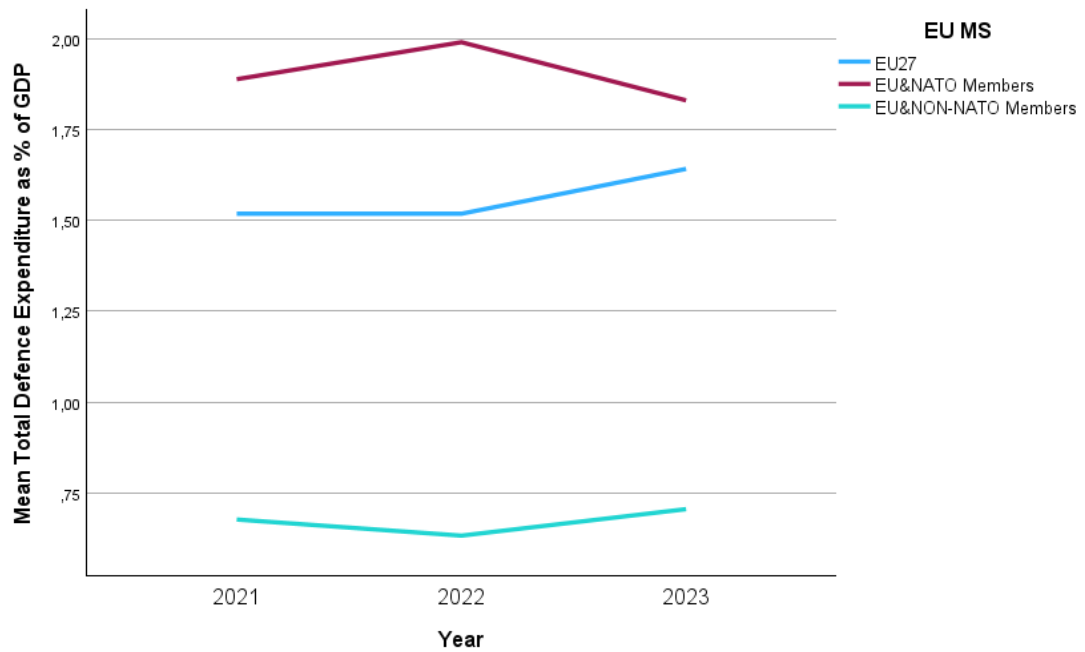


Figure 8 - Mean Defense Expenditure as % of GDP by EU Affiliation Group

If we look into the graph, we can conclude that countries that are members of both the EU and NATO have consistently spent more than their non-NATO members. This group recorded an average expenditure rate of almost 2% of GDP in 2022, reflecting a strong relation between these two organizations and emphasizing the need of cooperation between them as a key to Europe’s security future (Koops, 2012). Although they witnessed a slight decrease in 2023, their investment levels remained significantly higher compared to the other groups. By comparison, European Union members that were not members of NATO spent much less on defense, averaging less than 0.75% of their Gross Domestic Product. The EU27 MS increased their defense expenditure, not only being a response to immediate threats but also a broader recognition of structural vulnerabilities, in order to foster cooperation, reduce fragmentation and enhance collective efficiency.

2.4.3. Meta-inferences

This section consolidates the results of both the quantitative and qualitative analyses, providing fundamental conclusions concerning defense expenditure and policy coordination within the European Union. The objective is to integrate statistical data with stakeholder viewpoints to formulate more comprehensive and multidimensional findings.

The quantitative analysis confirmed significant variations in how EU MS allocate their defense expenditures according to their GDP. This analysis helps to support the

qualitative findings that corroborates and confirm certain tendencies. Countries with smaller economic budgets, such as Portugal, consistently invest below the EU average in absolute terms but demonstrate steady increases in proportional spending, confirming a gradual alignment with European defense goals.

Additionally, the strong Pearson correlation conducted and the regression model between the percentage of government expenditure allocated to defense and its proportion of GDP reinforce interview responses that stressed the importance of internal prioritization. EDA's stakeholders repeatedly pointed out that defense integration and burden sharing are most effective way to reach Europe and both data sources corroborate the argument that increasing national defense budgets is essential for improving defense readiness and EU coordination. The linear relationship between spending ratios further validates expert claims that budget allocation decisions at the national level have a direct impact on political alignment with EU defense mechanisms, such as EDA.

The integration of qualitative and quantitative findings also reveals additional layers of understanding that we would not find through a single method alone. For instance, while the statistical analysis shows Portugal's relative and numerical performance in defense investment, by several indicators, the interviews contextualize their participation in the EDA by taking part in PESCO projects. Initiatives such as the MHTC and the MUSAS, highlight how Portugal takes advantage of these EU mechanisms for its own benefit, providing an incentive for cooperation.

Moreover, interviewees consistently emphasized that member states must not only increase investment but must do it collectively and strategically. These topics complement the statistical conclusion that proportional increases in defense spending are only meaningful when tied to cooperative frameworks. The emphasis on interoperability, standardization, strategic and joint planning found in the qualitative analysis aligns with the identified need for efficiency in spending, as shown in the linear regression and Pearson correlation results.

This mutual perspective between findings strengthens the internal validity of the study and confirms that both analyses point to the same structural dynamics in European defense expenditures.

2.5. Conclusions

2.5.1. Theoretical and Managerial Contributions

This article is twofold, by presenting contributions to theory and practice. Firstly, from a theoretical perspective, the article shows how the defense sector has been undervalued

in European industry, and highlights that prioritizing this sector through the economic efforts of each member state and participation in collective initiatives brings many benefits to the EU defense space and to the states in question. Secondly, this research contributes to the literature by illustrating how the EDA can influence defense efficiency and coordination, based on expert interviews with stakeholders from the defense sector, highlight the Agency's role in reducing capability fragmentation among member states. Similarly, this research helps to understand how national defense investment performs across EU MS as a proportion of GDP. The use of quantitative methods, particularly a Pearson correlation analysis and a linear regression confirms that internal government prioritisation of defense is strongly associated with a wider macroeconomic defense commitment.

These findings directly address to RQ1. The results show that defense expenditure levels differ significantly across the EU. While some countries invest well above the EU average, others maintain persistent levels. The regression model ($R^2 = 0.88$) further demonstrates that most of the variation in GDP-level defense expenditures (2021-2023) is related to the internal prioritization of defense within national budgets by governments. This provides theoretical and practical confirmation that defense investment is not only a function of economic size, but a product of political choice and institutional alignment.

In this regard, the study also answers RQ2. The EDA's influence is shown to lie primarily in its ability to create incentives and initiatives for member states to align their investments and participate in joint programs. Interviewees highlighted its impact on capability planning, procurement coordination and the Agency's effort toward standardization. Although, the agency is limited by national sovereignty as this is a matter for the defense ministries of each member state. Each ministry has to realize that the agency is just a tool to support countries, and that everything else has to come from national interests in collaborating with the others and realizing that they achieve better results if they work together, because the EDA offers collaborative platforms and long-term strategic frameworks.

From a managerial point of view, the results offer practical guidance for policymakers. Firstly, the findings emphasize the necessity for governments to align defense budget allocations not only with national security needs but also with collective European objectives. Secondly, the integration of concerns into defense procurement and innovation processes emerged as a secondary yet growing trend. Finally, the study reinforces the need for increased cooperation between national governments, the EDA, research centers and industry stakeholders, particularly in the area of technological development, with the

intention of strengthening the European Defense Technological and Industrial Base (EDTIB).

2.5.2. Limitations and Recommendations for Future Research

This research bears limitations in the temporal scope of the quantitative data. The study relies on data available up to 2023 from the EDA datasets, which restricts its ability to reflect the most current dynamics in European defense industry. As defense policies and geopolitical concerns evolve rapidly, especially in response to ongoing global crises, new developments may already be reshaping defense investment patterns beyond what this research captures. Therefore, any conclusions based on the quantitative datasets must be interpreted with caution, acknowledging the risk of overlooking recent shifts or emerging trends post 2023.

Additionally, another methodological limitation is the confidentiality of data due to its nature (national sensitivities/security interests), which sets limits to the possible analysis. Certain information, particularly related to operational capabilities, procurement details or strategic planning, remains unapproachable to researchers, thereby restricting the depth of the analysis.

While this study draws on qualitative interviews with experts in EU defense, helping to acknowledge defense expenditure patterns in the context of EU, it does not focus on the effectiveness of specific EDA's initiatives or PESCO projects. Future research could benefit from exploring case studies of selected PESCO projects or other collaborative initiatives, in order to better understand their actual impact on spending efficiency and member states interoperability. Moreover, longitudinal studies incorporating post 2023 data will be essential to measure whether the upward trends observed in this study have been sustained, reversed, or transformed by recent geopolitical developments. Future research should also focus on studying how the EDA works with the procurement agencies such as EPF (European Peace Facility) and other European aid mechanisms. Such research could help to understand how these institutions complement one another in practice, both in terms of funding mechanisms and strategic planning, and how their coordination influences member states decisions and commitments for the benefit of defense. Understanding the interplay between these actors would contribute to a more holistic view of the EU's emerging defense system and offer contributions over the challenges and opportunities of European governance in this sensitive policy area.

CONCLUSION

This thesis tends to investigate a critical topic in European defense studies: the connection between national defense expenditures and the role of the European Defense Agency. The EDA is a crucial mechanism when it comes to shaping investment efficiency and policy alignment across EU Member States. This study offers a contribution to the subject through a structure consisting of two articles, with two methodologies, which together aim to study spending trends in the defense sector of EU member states, but also to analyze how the EDA seeks to optimize this spending and offer more joint and cooperative solutions to countries.

The research was guided by three core questions: *RQ1*: What is the role of the EDA in national defense expenditures? *RQ2*: To what extent do defense expenditures differ across EU member states when measured as a percentage of GDP? *RQ3*: How does the European Defense Agency contribute to enhancing defense spending efficiency within the EU? These questions were addressed through two complementary scientific articles, each serving a distinct purpose in the overall research framework. Chapter 1 provided a SLR, revealing key theoretical foundations and gaps in current literature regarding EU defense integration. Chapter 2 complemented this set of ideas with a mixed-methods empirical analysis that combined quantitative analysis of defense spending with qualitative data gathered from expert interviews (EDA's stakeholders).

The findings from this research offer significant theoretical contributions. Firstly, they reinforce the conceptualization of the EDA not merely as an administrative organ but as a strategic enabler of defense integration and capability development. While the EDA's intergovernmental nature limits its formal authority, the data collected, particularly from expert interviews, demonstrates that it plays a facilitative role in promoting policy alignment and interoperability among MS. Its coordination with mechanisms such as PESCO, CARD, and the EDF is essential. This institutional cooperation enhances its capacity to influence national budgetary priorities, particularly in smaller states where strategic planning and defense investment are not priority, and there is a lack of resources.

Furthermore, this study contributes to the existing literature on defense spending in the EU, helping to reveal some considerable disparities among MS in terms of the percentage of GDP allocated to defense and the percentage they allocate to defense according to their government expenditures. These tendencies in defense spending are influenced not only by

economic capacity but also by national political priorities and strategic planning inside the ministries of defense of each MS. Through quantitative analysis of EDA datasets, the thesis illustrates how national defense investments have evolved, during the period 2021-2023, in response to geopolitical events, such as the war in Ukraine. This quantitative analysis, in addition to showing us through some graphs the evolution of defense investments over the years, also incorporated a linear regression and a Pearson linear correlation. These two analyses showed that there is a great deal of mutual dependence between these two variables and that it is necessary to define priorities in the defense sector when deciding on the state budget. Nevertheless, these findings also indicate a positive correlation between institutional engagement (e.g., participation in PESCO or joint projects) and increased efficiency in defense expenditure allocation.

From a managerial standpoint, the thesis offers several practical insights. For policymakers, the research underscores the necessity of aligning MPLs with EU initiatives. This measure is vital to ensure that all member states are on the same page in the European defense industry in order to maximize budgetary effectiveness and to facilitate the procurement process. In particular, MS with smaller budgets such as Portugal should participate in EDA initiatives and PESCO projects to maximize its full potential as a member state and optimize its defense budget. The interviewees emphasized that it is this type of initiative that puts them at the forefront of the European industry. For example, by having led initiatives such as MHTC and MUSAS, Portugal is using these programs to its advantage and thus evolving the defense sector in terms of cooperation and leadership. This should be the way forward, from engaging in joint training initiatives and collaborations. Furthermore, one of the EDA's roles is to reinforce the need for MS to promote the defense sector development, through research and collaborative projects, which suggests a growing necessity for industrial strategy and a wider participation by creative defense companies. As such, it is imperative to keep up to date with technological advances and integrate emerging technologies such as AI and cyber capabilities into national and EU defense priorities.

However, this research is not without limitations. The systematic literature review was based on secondary data from the Scopus database and is thus inherently constrained by the scope and quality of available studies. Although the use of the PRISMA protocol intended to extend methodological rigor, relevant contributions may have been unintentionally excluded due to keyword restrictions or publication details. Chapter 2, the mixed-methods study, although it is supplemented by the interviews conducted, was based on a sample of EDA stakeholders only, and there may be valuable opinions from other

experts in the field that were not considered, which may limit the qualitative findings. Also in this section, another limitation was that only data up to 2023 was available on the EDA website, which limits the research in terms of the time period. In addition, another limitation of this study was that some data and documents that could be important for the research were confidential due to their secret nature, which makes some conclusions impossible and limits the scope of this thesis. Moreover, as a result to the rapidly changing of EU defense institution and geopolitical context, the implications of specific results may diminish over time and require future reevaluation.

In terms of future research recommendations, there are several themes that emerge. First, there should be conducted more extensive quantitative studies to analyse the long-term economic impact of collaborative defense initiatives across the EU. This type of studies can, for example, evaluate the effect of joint procurement within the EU and see if countries reduce costs by contracting together. Others could focus more on macroeconomic indicators such as GDP, employment rates and innovation output in this same context. Second, comparative case studies between EU and NATO defense planning could offer deeper insights into how combining these two institutions influences national expenditure patterns and strategic choices. Third, further investigation is needed into the institutional performance of the EDA and similar mechanisms. How do Member States perceive the return on investment from participating in EDA-led programs? How do bureaucratic structures within national ministries of defense align or conflict with supranational recommendations? Moreover, future research should consider the human dimension of EU defense coordination. The interviewees in this thesis suggested that social perceptions and institutional trust upon qualified human resources are critical enablers (or barriers) to increased defense integration. Lastly, future studies could benefit from the triangulation of data across multiple EU countries, with a focus on thematic case studies that measure the impact of EDA-backed initiatives or PESCO projects. Such analysis would provide empirical validation and guidance for MS and EU institutions seeking to strengthen the EDTIB.

In summary, this dissertation is an important addition to the evolving field of European defense studies, raising awareness for institutional, economic and strategic pressures that underline defense expenditures in the EU. It highlights the EDA's pivotal role in shaping defense patterns and advancing a more coherent, interoperable and capable European defense posture, at a time that EU faces renewed security threats and growing calls for strategic autonomy.

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APPENDIX A - CHARACTERISTICS OF SLR STUDIES (N = 19)

Author (s)	Year	Purpose	Methodology	Main Findings
Bătușaru & Sbârcea	2023	Assess the link between defense expenditures and sustainable development in Romania.	Case Study	The findings provide a comprehensive analysis of the current situation but also identifies potential pathways for enhancing the sustainability of Romania's defense sector. This study contributes to the broader discourse on sustainable security fostering a more resilient and sustainable future.
Dudzevičiūtė et al.	2021	Explore the relationship between defense expenditure and government debt in small European Union countries that are Members of NATO.	Exploratory Study	The findings show that, whether for increasing defense expenditure or for stable or decreasing defense expenditure, the trajectories of government debt have no clear interrelation in explored countries. Therefore, the cause of government debt by means of defense expenditure alone can only be partially explained.
Charlotte D.	2024	Examines the relationship between the defense spending of European, NATO Members and their exposure to asylum seekers.	Panel analysis	The findings show a positive and significant relationship between the number of asylum seekers registered in a country and its overall military expenditure relative to GDP, equipment spending, and infrastructure spending.
Fedorchak V.	2021	Addresses the current trends in European security cooperation, with a narrower focus on national military-industrial complexes and defense cooperation in the EU.	Literature Review	The findings show that increasing interdisciplinarity and the military capabilities side of defense research designs, a more significant impact and participation in policy shaping and capabilities development can be achieved.

Yukins & Schoeni	2023	Defers to the existing literature and instead places the US practice of defense procurement law in a broader context, especially in light of Russia's war against Ukraine.	Literature Review	The findings conclude that legal practitioners in this discipline, even if they are not specifically defense experts, can share a common skillset crucial to preserving democracy and rebuilding Ukraine, despite this terrible war.
Negri & Dincă	2023	Provides essential information for public officials in order to prepare the EU economy for the recovery from war shocks in the forthcoming period.	Panel analysis	The findings prove that war has a significant impact on the economic output of the European Union structure, especially for the EU countries that rely the most on Russia's energy imports.
Lavallée & Martins	2024	Explore the integration of drones in Europe's airspace to enable progress on numerous policy objectives.	Literature Review	The findings capture the growing importance of dual-use technologies, both in society at large and in the security and military domains. This is particularly relevant in the current European context of growing military expenditure with the war in Ukraine
Fabbrini F.	2024	Examines the Act in Support of Ammunition Production (ASAP), adopted by EU in 2023 to boost the production capabilities of the EU defense industry with a view to supporting Ukraine in the war against Russia.	Literature Review	The findings suggest that ASAP is a step in the direction of establishing a European defense union, seen both as a combination of military capability and industrial capacity.

Becker J.	2021	Enhances understanding of the relationship between national political economies and burden shifting, operationalizing burden shifting as the extent to which a country limits or decreases defense expenditures.	Literature Review	This research highlights the intimate connection between Europe's economic fortunes, transatlantic security, and burden sharing in North Atlantic Treaty Organization and the European Union - of particular interest as a pandemic buffets the transatlantic economy.
Becker J. et al.	2024	Illustrate the utility of the disaggregated defense spending dataset by replicating canonical and newer analyses using both the overall data and its disaggregated components	Empirical Research	The findings suggest that disaggregating defense spending is likely to improve the analysis of old and emerging research questions of considerable policy importance, and points to several opportunities to do so.
Molnár & Vecsey	2022	Investigates how distance affects the political decisions on interventions, from geographically the closest to the farther CSDP missions and operations.	Exploratory Study	The findings suggest that CSDP missions have gained political and financial support due to the migration crisis, with the 2015 European Agenda on Migration formally integrating migration control into the objectives of these missions.
Mombelli S.	2024	Analyzes defense burden sharing and defense cooperation in the European Union.	Case Study	The findings show that the Russian invasion of Ukraine has led to an increase in military spending and procurement, but at the expense of defense cooperation among EU Member states. This trend suggests growing fragmentation and a reversal of previous efforts towards a common EU defense framework.

Prieto V.R.	2024	Explores the response to the war in Ukraine on the part of the European Union (EU).	Literature Review	The findings show how, in the wake of Russia's aggression against Ukraine, the CSDP has made unprecedented, yet still only partial steps to allow the EU to progress towards moving beyond its traditional status as a small power.
Mader M. et al.	2024	Examine whether public support for a common EU security and defense policy is stable or subject to change when associated costs are introduced.	Experimental Study	The findings indicate that public support for EU defense cooperation is high in general, but declines significantly when costs are mentioned, suggesting that opinions are susceptible to politicization and not always reflective of firm policy preferences.
Eswaran M.	2024	Develop a theoretical model of political realism that explains how a hegemon sustains its dominance by fostering global instability and increasing defense expenditures among its allies.	Case Study	The findings indicate that a unipolar hegemon benefits from global instability by inducing higher defense expenditures among its allies and profiting from arms sales, challenging neoliberal arguments that NATO's expansion promotes stability.
Becker J.	2021	Analyze the factors influencing transatlantic burden-sharing in defense spending, particularly in NATO's Black Sea littoral states (Bulgaria, Romania, and Turkey).	Mixed-Methods Analysis	The findings indicate that national and regional political economies play a more significant role in shaping burden-sharing decisions than geostrategic considerations, particularly in the current strategic environment.
Sysoiev D. et al.	2024	Identify existing regulatory mechanisms for combating corruption in the defense sector and explore ways to strengthen them based on the experience of European countries.	Exploratory Study	The findings demonstrate that independent institutions, ISO 37001 compliance, and digital monitoring effectively reduce corruption and increase trust in defense sector institutions. The study also emphasizes the need for a centralized resource management system in territorial defense, particularly in Ukraine.

Iuga & Socol	2023	Analyze the impact of military expenditures on GDP in 27 European Union countries from 1998 to 2021, comparing NATO and non-NATO Members.	Panel Analysis	The findings reveal that current military expenditures positively influence GDP in both NATO and non-NATO EU countries. However, past military expenditures have a positive effect in NATO countries but a negative effect in non-NATO countries, highlighting structural differences in defense commitments and economic impacts.
Dominese G.	2020	Examine the impact of emerging advanced technologies on global geopolitical and military strategies, with a focus on Europe's response to increasing technological competition.	Exploratory Study	The findings suggest that the rapid evolution of civil and military technologies has intensified global competition, driving Europe to enhance its strategic positioning in key sectors such as aerospace, nuclear energy, and defense production.

APPENDIX B – INTERVIEW PROTOCOL

I, _____, agree of my own free will to participate in this dissertation entitled “National Defense Expenditures and the role of European Defense Agency”, carried out by Military Administration Aspirant Leonel Ferreira Guedes, in accordance with what has been previously explained to me by him. I understood the explanation and the objectives of this research in its entirety, in particular that the collection of the requested data is solely and exclusively for scientific purposes and that all the information provided will be treated confidentially. I was also given the opportunity to ask any questions I felt necessary regarding the research. I am aware that the results of this research may be used for publication purposes, and I have also been informed that after processing the data provided, all materials (transcripts) will be destroyed. I therefore give my consent for all the data processed to be made available in open source. My identity will not be published without prior authorisation and anonymity will be guaranteed throughout the research process.

Once I have signed, I will receive a copy of this consent duly signed by both parties and I will not be able to revoke it.

Name:

Role:

Workplace:

Location:

Date:

1. In your professional experience, what direct and indirect impacts does the European Defense Agency (EDA) have on the defense budgets of EU member states, particularly Portugal?

2. What role does the EDA play in promoting collaboration among member states to optimize defense spending?

3. In your opinion, how can EDA enhance its support to effectively integrate national defense priorities and collective European defense initiatives?

4. Could you highlight specific programs or initiatives led by the EDA that Portugal

has benefited from?

5. What challenges do EU member states with smaller budgets, such as Portugal, face when aligning their defense expenditures with EDA recommendations?

6. What is your view on the future of European defense integration, and what implications could this have for the defense budgets of countries like Portugal?

7. How can countries like Portugal, with relatively limited defense budgets, maximize their participation in EU defense projects?

8. Do you believe that instruments such as the European Defense Fund and PESCO initiatives have been effective in encouraging Portugal and Member States to invest in joint defense projects?

9. What advice would you give to policymakers in Portugal to better align their defense strategies with EU initiatives?

10. Are there any areas where you see room for improvement in the collaboration between the EDA and member states, particularly those with smaller economies?

11. How do you envision the EDA's role evolving in the coming decade, and what opportunities might this present for Portugal?

APPENDIX C - TOTAL DEFENSE INVESTMENT BY EU MS (2021-2023)

		Defense Investment (Millions €)		
		Year		
		2021	2022	2023
EU MS	Austria	398,90	327,90	573,50
	Belgium	920,20	1276,20	1442,85
	Bulgaria	223,10	292,00	525,03
	Croatia	345,24	381,40	319,37
	Cyprus	97,61	141,83	130,19
	Czech Republic	666,93	926,70	1133,76
	Denmark	-----	974,00	950,00
	Estonia	185,39	229,56	557,12
	Finland	2029,70	1931,00	2610,93
	France	13.300	14.200	15.997,86
	Germany	9350,17	10.692,92	12.749,57
	Greece	2541,65	3429,44	1591,66
	Hungary	962,87	1474,72	1580,00
	Ireland	114,25	118,30	200,00
	Italy	5968,76	5985,00	6156,96
	Latvia	204,00	199,00	370,39
	Lithuania	247,65	573,65	465,00
	Luxembourg	135,50	248,37	350,57
	Malta	4,00	9,08	4,22
	Netherlands	3448,00	2167,00	2829,38
Poland	4405,10	4789,60	10.958,80	
Portugal	533,16	624,74	864,97	
Romania	1030,57	1283,72	1215,40	
Slovakia	566,29	563,70	590,60	
Slovenia	98,03	165,01	201,88	

Spain	2881,74	3319,24	4860,13
Sweden	1588,20	1776,00	2745,06

**APPENDIX D - PEARSON CORRELATION (TDE AS % OF GDP &
TDE AS % OF GOVERNMENT EXPENDITURE)**

Correlations

		TDE as % of GDP	TDE as % of government expenditure
Total Defense Expenditure as % of GDP	Pearson Correlation	1	.938**
	Sig. (2-tailed)		<.001
	N	89	89
Total Defense Expenditure as % of government expenditure	Pearson Correlation	.938**	1
	Sig. (2-tailed)	<.001	
	N	89	89

** . Correlation is significant at the 0.01 level (2-tailed).

APPENDIX E - LINEAR REGRESSION (TDE AS % OF GDP & TDE AS % OF GOVERNMENT EXPENDITURE)

Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Total Defense Expenditure as % of government expenditure ^b	.	Enter

a. Dependent Variable: Total Defense Expenditure as % of GDP

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.938 ^a	.880	.879	.24417

a. Predictors: (Constant), Total Defense Expenditure as % of government expenditure

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.197	.061		3.228	.002
	Total Defense Expenditure as % of government expenditure	.386	.015	.938	25.284	<.001

a. Dependent Variable: Total Defense Expenditure as % of GDP