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Defence Spending in the European Union

Alessandra Cepparulo
and Paolo Pasimeni

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Alessandra Cepparulo and Paolo Pasimeni

Abstract

After more than 60 years of peace, Europe faced a watershed moment in its security, in February 2022. Following a brief overview of how years of underinvestment and fragmentation have left many weaknesses in EU defence, this study analyses the evolution of the EU defence strategy, the contribution by the EU budget and by national budgets. Finally, the paper investigates to what extent the recent increase of defence spending can have a positive effect on growth, by examining the link between defence spending and economic growth, on the basis of the existing literature.

JEL Classification: H56, H77, O40.

Keywords: defence spending, EU countries, EU budget, economic growth.

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Contact: Alessandra Cepparulo, alessandra.cepparulo@ec.europa.eu, and Paolo Pasimeni, paolo.pasimeni@ec.europa.eu, European Commission, Directorate-General for Economic and Financial Affairs and Directorate-General for Internal Market and Industry.

ABBREVIATIONS

ASAP	Act in Support of Ammunition Production
CEF	Connecting Europe Facility
CSDP	Common Security and Defence Policy
EDA	European Defence Agency
EDF	European Defence Fund
EDIRPA	European defence industry reinforcement through common procurement act
EPF	European Peace Facility
EU	European Union
GDP	Gross domestic product
MFF	Multiannual financial framework
NATO	North Atlantic Treaty Organization
OECD	Organization for Economic Cooperation and Development
PESCO	Permanent Structured Cooperation
TFEU	Treaty on the Functioning of the European Union
UN	United Nations

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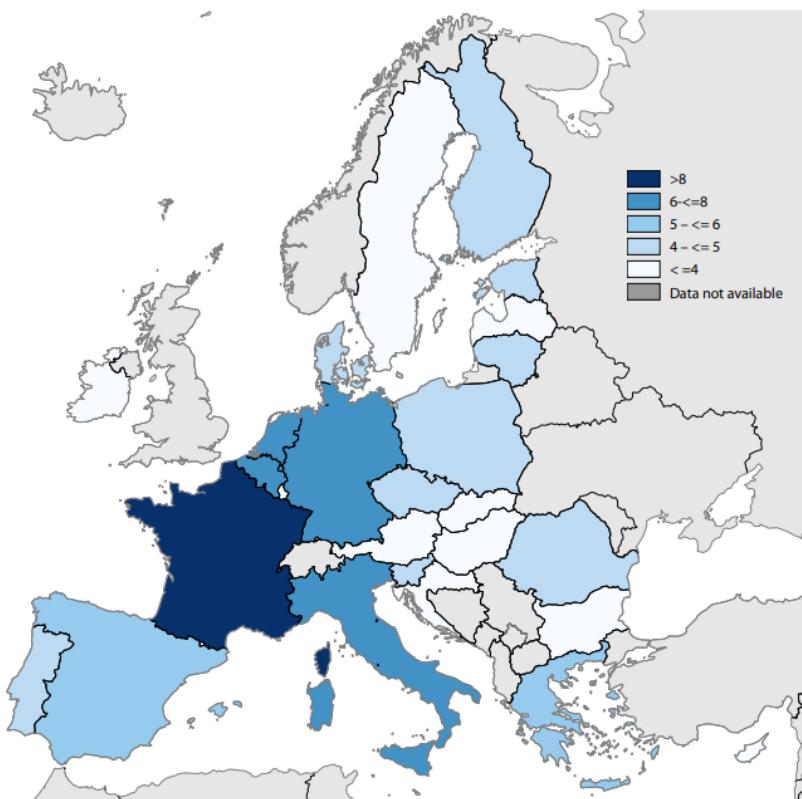
1. INTRODUCTION

After decades of peace, in February 2022, Europe witnessed a watershed moment in its security. Russia's invasion of Ukraine has suddenly and drastically shaken the geopolitical equilibria, resuming war on European soil.

In the European Union (EU), years of underinvestment and fragmentation have resulted in numerous gaps in defence capabilities. Significant reductions in national defence budgets and a shift away from territorial defence to expeditionary operations have led to a decline in national force volumes and equipment stockpiles.

According to the "European sovereign index" (Puglierin and Zerka (eds.), 2022), which measures the overall sovereignty in defence by combining commitments¹ and capabilities² of each country, the majority of the EU Member States perform inadequately (11) or poorly (9), in 2022. Only larger countries have satisfactory (Spain and Greece); good (Belgium, Germany, Italy, Netherlands) or excellent (France) scores.

Graph 1. **Defence: Overall performance**



Source: European sovereignty index. Grading system: <0-4) = failing; <4-5) = poor; <5-6) = satisfactory; <6-8) = good; <8-10> = excellent.

¹ To evaluate countries' capabilities, the index assesses defence spending; troops deployed in joint missions and operations; membership in and contributions to military alliances and multinational standing forces; industrial cooperation; and military equipment". (Puglierin and Zerka (eds.), 2022, p.18. A complete list of indicators can be found at : <https://ecfr.eu/special/sovereignty-index/#terrain-defence>.

² "To evaluate commitment, the index assesses public opinion, member states' official statements, and participation in joint research and development efforts." (Puglierin and Zerka (eds.), 2022, p.18): A complete list of indicators can be found at : <https://ecfr.eu/special/sovereignty-index/#terrain-defence>.

When considering the specific components of the index (commitments and capabilities) we observe that the average scores for commitments in EU countries are higher than those for capabilities, implying a lack of resources or an allocation that does not fully matches needs.

The Capability Development Plan, prepared by the European Defence Agency (EDA) in 2018, already identified 11 priorities for capability development, addressing shortfalls for deployed operations (land, maritime and air, logistic and medical support, territorial defence and cyber defence). In the same vein, the joint communication produced by the European Commission (EC) and the European Defence Agency (JOIN(2022) 24 final) classifies those capability gaps on the basis of their urgency. Among the most urgent we find: replenish stockpiles, “strengthen the multilayer Air and Missile Defence systems of Member States” and “phase out existing Soviet era legacy systems still in use within EU armed forces with European solutions”.

After the Russian invasion of Ukraine, the majority of EU countries announced an increase in their defence budgets. A commitment confirmed by the Council of the European Union in the Strategic Compass (Council of the European Union, 7371/22), through which Member States committed to increasing their defence expenditures to close critical military and civilian capability gaps and strengthen the European Defence Technological and Industrial Base.

According to EC (JOIN(2022) 24), not only is an increase in spending required, but it should be deployed in a coordinated manner, in order to make up for existing shortfalls. Fragmentation in spending can be a source of inefficiency. EU Member States often act in isolation rather than coordinating their military efforts, with the cost of this lack of cooperation estimated between €25 billion and €100 billion per year. According to the 2022 coordinated annual review on defence report, only 18% of all defence investments are conducted in collaboration. This contrasts with the commitment under the Permanent Structured Cooperation (PESCO)³, which set a 35% benchmark for collaborative equipment procurement. In general, cooperation is pursued only when it coincides with national plans or benefits the national industry.

After discussing the role of national and supranational governments in defence spending, this paper provides an overview of actual defence spending across levels of government: national and EU levels, using various data sources. To the best of our knowledge, this represents a novelty. In addition, given the recent increase in spending and the desire to expand it further in the future, the paper also considers the possible impact of defence spending on economic growth, based on the assessments available in the literature.

The structure of the paper is as follows. Section 2 describes the evolution and composition of defence spending at national level. Section 3 presents the contribution of the EU budget to defence spending. Section 4 examines the main findings of the literature on the nexus between defence expenditure and economic growth... The last section concludes.

2. TRENDS IN DEFENCE SPENDING: SOME FACTS

Several advanced countries (US, UK, Canada, and Australia) over the last 70 years have significantly decreased their share of military spending on GDP⁴. For the EU countries, as well as for New Zealand, and Japan, however, this decline has been less pronounced, also because the initial levels were considerably lower (Graph 2). The decreasing trend is particularly evident for the US, starting in the early 1950s, at the height of the Korean War, at around 14% of GDP. The significant decrease in military spending started in the mid-1960s, but by the end of those years, an upward trend testified the build-up of the United States' strategic nuclear arsenal. A second downward trend followed in the 1970s (when the defence burden was cut in half) and it is explained by the 'doctrine of flexible response', which shifted NATO defence burdens to European allies (Sandler and George, 2016).

³ PESCO in the area of security and defence was firstly introduced by article 42(6) of the Lisbon Treaty on European Union (TEU).

⁴ Military spending accounts for more than 90% of EU military budgets. Defence spending also includes civil defence and ongoing costs from prior military activity (veterans benefits, demobilisation, conversion of arms production facilities, and weapon destruction).



Box 1 DEFENCE POLICY IN THE EUROPEAN UNION

The project of European integration has been strictly linked to the notion of peace and defence, since its inception, after World War II. The first attempt to establish a common European defence capacity was in 1954, by the European Defence Community (EDC). Such attempt eventually failed, and the NATO took over the task of military integration of Western Europe in a transatlantic framework.

In the seventies, and until the Maastricht Treaty established the European Union (EU), the “European Political Co-operation” was an attempt to coordinate the foreign policies of the Member States of the European Communities. Such political co-operation, formalised in the 1970s, launched an informal consultation mechanism among Member States to try to co-ordinate foreign and defence policies. The mechanism worked in some situations, but its effectiveness was seriously tested in the case of the Yugoslav Wars, which showed its weaknesses. After the end of the Cold war, and during the Yugoslav Wars, the Maastricht Treaty attributed new tasks to the newly born EU, introducing, among others, a Common Security and Defence Policy.

Designed to avoid duplications and a break with the Atlantic Alliance, the common security and defence policy is characterised by two phases: the focus on crisis management prevailing during the 1990s/2000s and the period since 2014 with a greater attention given to deterrence and collective defence (Major and Mölling, 2020). According to Graf von Kielmansegg (2019), however, the evolution of the EU defence policy occurred in four stages.

First phase. The Maastricht Treaty (1992) marks the beginning of the first phase which is defined by the legal establishment of a common foreign and security policy (Title V). Strictly intergovernmental in nature, it recognised the Western European Union as a defence component of the European Union. In particular, Article J4 of the Treaty states that common foreign and security policy includes “all questions related to the security of the Union, including the eventual framing of a common defence policy, which might in time lead to a common defence”. Nonetheless, its goals are ‘to safeguard the common values, fundamental interests and independence of the Union’, ‘to strengthen the security of the Union and its Member States in all ways’, ‘to preserve peace and strengthen international security’, ‘to promote international cooperation’ and ‘to develop and consolidate democracy and the rule of law, and respect for human rights and fundamental freedoms’. The Amsterdam Treaty of 1998 codified, then, new structures and tasks for common foreign and security policy and incorporated the “Petersberg Tasks” (humanitarian and rescue missions, peacekeeping operations, and the deployment of combat forces in crisis management). Besides, as a result of this treaty, the Union was able to speak with “one face and one voice” thanks to the creation of the post of “High Representative for Common Foreign and Security Policy”.

Second phase. A second phase, triggered by the UN’s peacekeeping limitations in Srebrenica in 1995 and Rwanda in 1994, starts with the Saint Malo Declaration in 1998, which can be regarded as “the catalyst for the European Security and Defence Policy” (Lindstrom, 2021). The declarations of the following European Council (1999a and b) established the EU as a defence player. On that occasion the European leaders expressed the determination to develop an autonomous capacity to take decisions on the full range of conflict prevention and crisis managements; they also defined the guidelines to sketch the capabilities (military and civilian) needed to fulfil the Petersberg tasks, and the institutions for making this policy operative. The need for dedicated military and political bodies (the Political and Security Committee, the EU Military Committee, and the EU Military Staff) was expressed in that occasion but they were formally established only by the European Council in Nice, in 2000. The European Security and Defence Policy (ESDP) was then expected to become operational by 2003.

A step further is represented by the Berlin Plus arrangements, granting the EU access to NATO assets and capabilities under certain conditions. Since 2003, military forces from EU Member States have been involved in a growing number of peacekeeping operations and training missions (over thirty-five crisis-management missions and operations) both inside and outside Europe. According to von Ondarza (2010), most of these operations were small and symbolic, and in all cases, the European Union and its members struggled to gather the necessary capabilities. These operations also pointed to the EU lack of self-sufficiency. Through the European Security Strategy adopted in 2003, key threats and challenges, as well

as how to address them, were identified for the first time, and the European Defence Agency (EDA) was established to improve European defence capabilities in the field of crisis management.

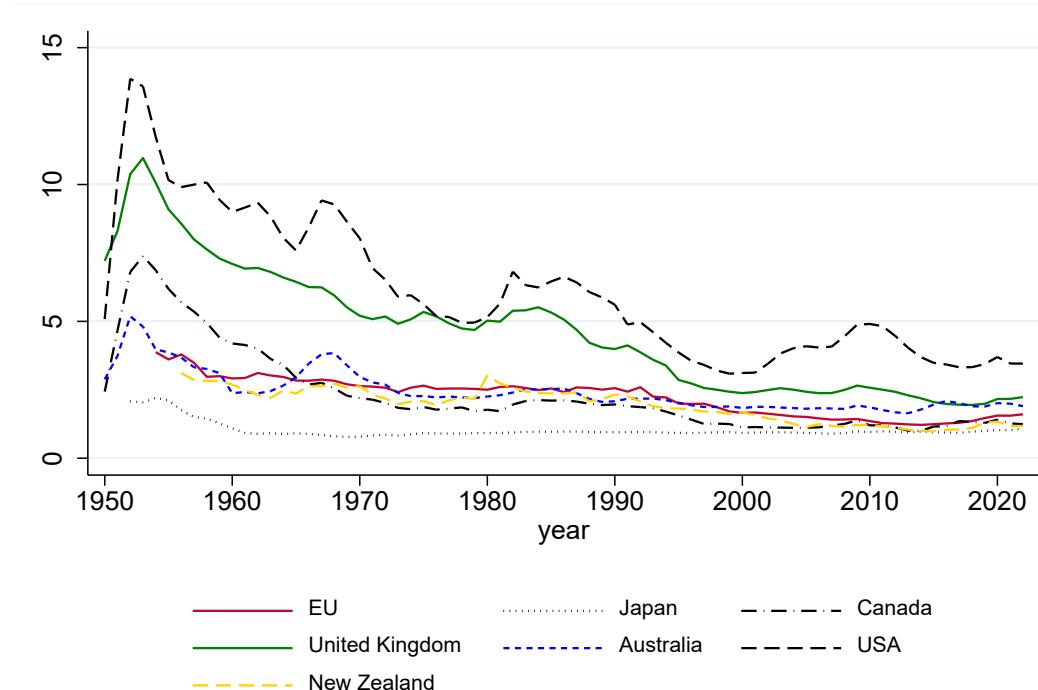
Third phase. The third phase, beginning in 2005, is regarded as a stagnation. The Lisbon Treaty (2007), in addition to renaming the policy "Common Security and Defence Policy-CSDP," only codified what had already been accomplished up to that point. Defence was no longer among the political priorities (Graf von Kielmansegg, 2019). The Treaty provided the EU with full legal personality, allowing the Union to sign international treaties and join international organisations as a full entity. It also established the European External Action Service (EEAS), placed under the leadership of the High Representative of Common Security and Foreign Policy. Among the novelties, it introduced a framework for permanent structured cooperation-PESCO (Articles 42(6) and 46 TEU and Protocol 10), the introduction of a mutual defence clause (Article 42(7)), a solidarity clause (Article 222 TFEU), enhanced cooperation (Article 20 TEU), the expansion of the Petersberg tasks (Article 43 TEU) and the commitment of the European Defence Agency (EDA) to regularly assess Member States' contributions (Lazarou and Dobreva, 2019; Lindstrom, 2021). A further reduction in capabilities took place in the late 2000s because of underinvestment following the Cold War, as well as little to no coordination, resulting in duplications, superfluous equipment, and growing capability gaps and shortfalls.

Fourth phase. Finally, a fourth phase of revival began with the EU global strategy in 2016. Since 2014, a growing perception of a threat following Russia's annexation of Crimea and the war in eastern Ukraine has prompted European defence cooperation. The EU global strategy addressed five priorities: (1) the EU's own security; (2) enhancing the resilience of the neighbourhood; (3) the use of an integrated approach when dealing with war and crisis; (4) support for stable regional orders around the world; and (5) effective global governance. This implied further developments for the CSDP, which is now distinguished by a coherent mechanism to enhance collaborative defence capability planning, development, procurement and operation. Along with the Capability Development Plan (CDP), used since 2008 to address long-term security and defence challenges, three new tools have been added: the Permanent Structured Cooperation (PESCO), the Coordinated Annual Review on Defence (CARD) and the European Defence Fund (EDF). So, the Council, in December 2017 aimed to enhance the collaboration between participating EU Member States by establishing a 'framework and a structured process to gradually deepen defence cooperation' and create 'a more coherent European capability landscape'. In the same year, the Council endorsed the modalities for establishing the CARD which provides Member States with a comprehensive overview of the European defence landscape (capability, research and industrial aspects) in order to better identify opportunities for new collaborative initiatives. Finally, to reduce the European dependence on non-European actors in developing new and defence technologies, the Commission introduced in the Multiannual Financial Framework of the Union 2021-2027, the European Defence Fund (EDF).

The most recent development, in March 2024, has happened when the European Commission has tabled a proposal for a new defence industrial strategy, with the objective of stepping up its defence readiness, i.e. creating a steady state of preparedness of the Union to protect the security of its citizens, the integrity of its territory and critical assets or infrastructures, and its core democratic values and processes. Based on an analysis of investment and capability gaps, this strategy calls for more investment in defence, a more secure supply, and deepened partnership. This strategy sets three clear targets to be achieved by 2030: first, it requires intra-EU defence trade to represent at least 35% of the value of the total EU defence market; second, at least 40% of defence equipment should be procured in a collaborative manner; and third, at least half (and 60% by 2035) of defence procurement should be sourced internally in the EU.

The Reagan defence build-up caused a rebound in the 1980s. Defence spending fell again in the 1990s, the post-Cold War peace dividend years, but this trend reversed following the terrorist attacks of September 11, 2001, and the wars in Afghanistan and Iraq (Sköns et al. 2004). As a result of the Great Financial Crisis, a new downturn in military spending has been observed, as concerns about the US budget deficit resulted in general cuts in government spending.

Graph 2. **Defence spending (% of GDP): EU countries vs other advanced economies**



Source: Stockholm International Peace Research Institute (SIPRI).

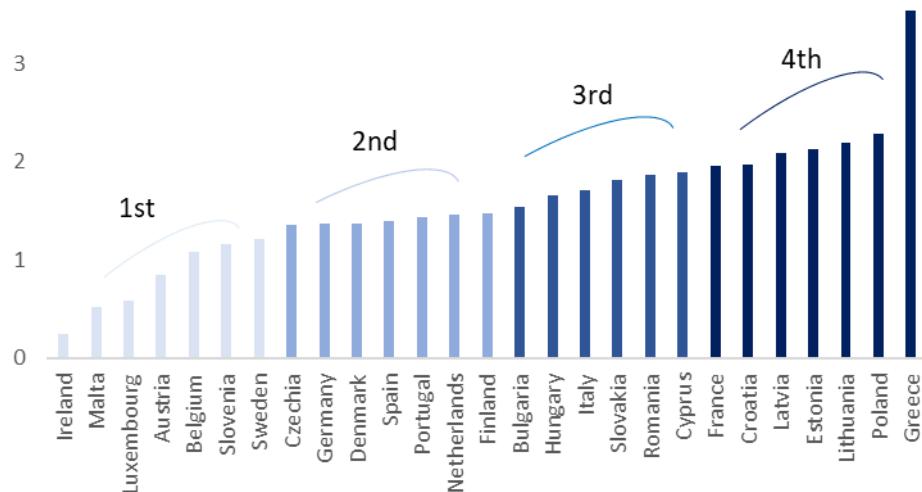
By 2022, military spending in almost all countries fell below 3 percent of GDP (around 2 percent for EU countries, Australia and UK and around 1 percent for JP, New Zealand and Canada). The United States is the only exception with 3.5 percent of GDP. European countries exhibit very diverse patterns of defence resource allocation. Based on '20s average military spending data, four groups of countries can be identified according to their level of spending. The first quartile (shown in light blue in Graph 3) includes mostly smaller countries (Malta, Luxembourg, and Belgium) or countries that are not members of the NATO alliance (such as Ireland, Sweden⁵, and Austria), with defence expenditure lower than 1.3 percent of GDP. With the exception of Sweden, the defence burden for this cluster has consistently been lower than the EU average over time.

Instead, three of the largest European countries are included in the second quartile (in a darker colour), with expenditures ranging between 1.3 and 1.6 percent of GDP. The only exception is France, which is in the third quartile (mid blue) and has a level of spending of up to 2%, consistent with its large defence industry. The fourth quartile (dark blue) includes the Baltic republics, Poland, Portugal, and Greece, which have the highest level of expenditure ranging from more than 2% to nearly 4%. In particular, Greece consistently spends more than the EU-average, which is explained by the geopolitical position of Greece and the considerable tensions in the region.

⁵ On 5 July 2022, all NATO member countries signed the Accession Protocol for Sweden to join the alliance which became NATO's newest member on March, 7 2024.

Graph 3. 2020-2022 EU Member states defence spending (% of GDP)

4



Source: SIPRI. Note: The shades of blue represent the quartiles.

In 2022, 6 Member States were spending more than 2% of their GDP in defence spending, in line with the NATO⁶(2014) commitments of reaching a minimum spending of 2% of GDP in a decade.

EU Member States are not only guided by the NATO commitments but, as part of the Permanent Structured Cooperation (PESCO), they agreed in 2017 to increase defence budgets in real terms on a regular basis as one of their 20 common commitments. Half of the countries met their commitment (Graph 4) with a consistent increase across the latest five years. Only one country (Croatia) has demonstrated positive growth in two years. Malta⁷ is not among the PESCO participating members and did not commit to any specific target.

Graph 4. Number of years with a positive growth: 2018-2022



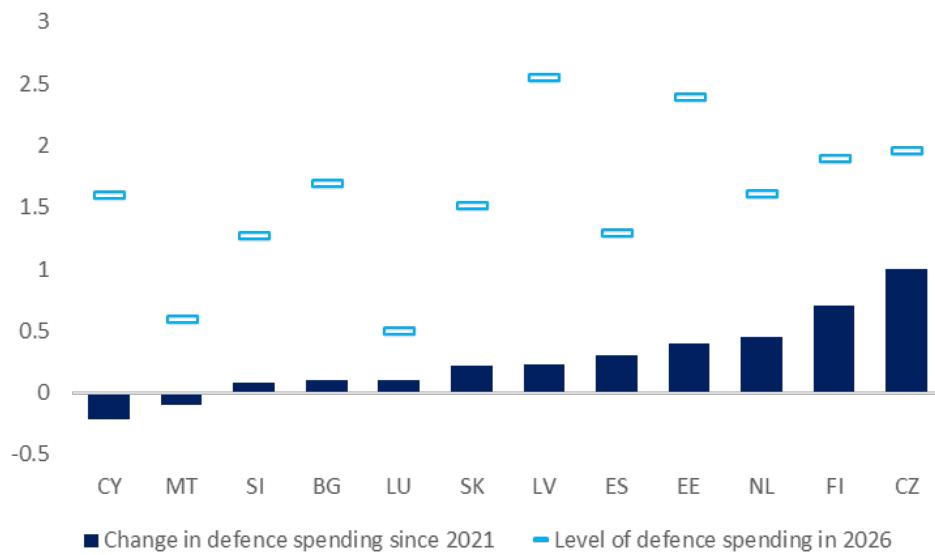
Source: Own elaborations based on SIPRI defence expenditure series in constant USD.

⁶ At that time the United States accounted for over 65% of all transatlantic defence spending (Becker, 2019).

⁷ Denmark joined formally PESCO on May 2023.

Based on the Stability and Convergence Programmes that Member States submit to the European Commission, we can see that at least nine of them have planned further increases in defence spending by 2026 (Graph 5). Czechia (by 1 percentage point of GDP) and Finland⁸ (by 0.7 percentage point of GDP) are on top of this list. The Netherlands, Estonia, and Spain intend to increase defence spending by 0.5, 0.4, and 0.3 percentage points of GDP, respectively. Other four countries (Slovakia, Latvia, Luxembourg, and Bulgaria), which have provided plans for future spending, plan an increase of less than 0.2 percentage points of GDP by 2026.

Graph 5. **Defence expenditure planned in the SCPs 2026 (% of GDP)**



Source: 2023 Stability and Convergence Programmes.

The national programmes of other eight countries⁹ mention future budgetary impact of defence spending although no quantitative information is provided, while the programmes of the remaining eight countries have no mention to defence spending¹⁰.

Personnel spending represents on average almost half of the resources dedicated to defence spending¹¹. Although there has been a downward trend in all countries, the EU's expenditure in this category remains relatively high at 48.3%, highest among the most advanced economies. This result seems to confirm the theory of burden shifting inside the NATO alliance (Becker, 2017). In case of fiscal pressure and in order not to lose the benefits of being part of an alliance, countries can favour, within the defence budget, those expenditure categories with more direct domestic benefits. As a result, personnel would be the most appealing choice, given the immediate gains in terms of employment, at the expense of other defence spending items (equipment¹² and operation and maintenance¹³), whose domestic benefits are less immediate.

⁸ In the case of Finland, the expected increase of spending is also related to the NATO membership.

⁹ Austria, Croatia, Italy, Sweden, Denmark, Germany, Lithuania and Poland.

¹⁰ Belgium, Greece, France, Ireland, Hungary, Romania, Portugal, Slovenia. The absence of a reference to this topic in the SCPs does not preclude the existence of this information in other official documents.

¹¹ Personnel expenditure includes military and civilian expenditure and pensions according to the Nato definition.

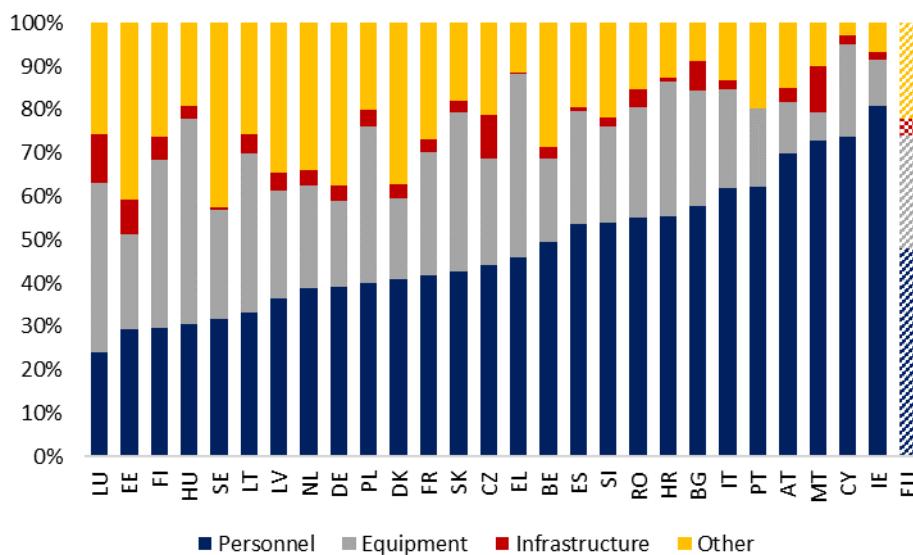
¹² Equipment expenditure includes major equipment expenditure and R&D devoted to major equipment, according to the Nato definition. Only countries with domestic defence industry tend to get positive spillovers from this kind of spending.

¹³ Other expenditure includes operations and maintenance expenditure, other R&D expenditure and expenditure not allocated among above-mentioned categories according to the Nato definition.

In this regard, there is significant variation across EU countries, with Luxembourg spending the least (24%) and Ireland spending the most (78%) on personnel (Graph 6). In contrast, the lowest amount of resources in terms of the defence budget (around 4%) are allocated to spending on infrastructures. Equipment¹⁴ absorb around one fourth of the total resources dedicated to the defence sector. The amount dedicated to equipment increased over time, putting the EU on track to reach the level of expenditure of other advanced economies.

Other operating expenses consume another third of the total resources dedicated to the defence function.

Graph 6. Defence expenditure composition in the EU countries in 2022



Source: NATO defence data. For the non-NATO members, the data comes from EDA.

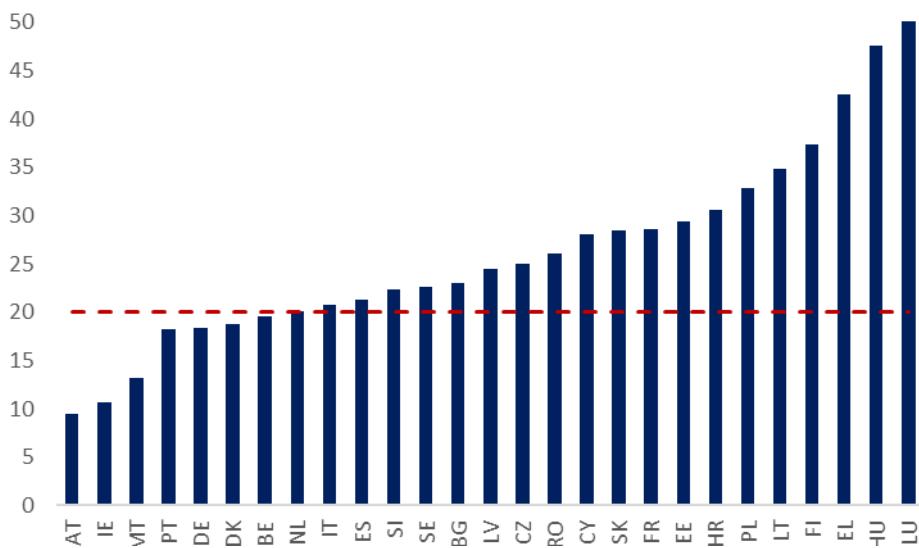
Twenty EU Member States dedicated 20% of defence expenditure to investment¹⁵ in 2022 (Graph 7). The NATO (2014) and the European Council (2017)¹⁶ fixed a target for defence investment expenditure calling for a “medium-term increase in defence investment expenditure to 20% of total defence spending (collective benchmark)”. The current level of investment represents an improvement, considering that only 8 Member States had reached that target by 2017. Collectively, the EU reached the 20%-target since 2019 and it is now equal to 24.2%.

¹⁴ This category of spending corresponds to the defence investment concept used by EDA. See on the correspondence of the decomposition by these two sources (Becker et al. 2024)

¹⁵ On average the EU defence investment was around 0.5% of GDP in 2022.

¹⁶ Council decision (CFSP) 2017/2315 of 11 December 2017.

Graph 7. **2022 Defence investments in EU countries (% of total defence expenditure)**

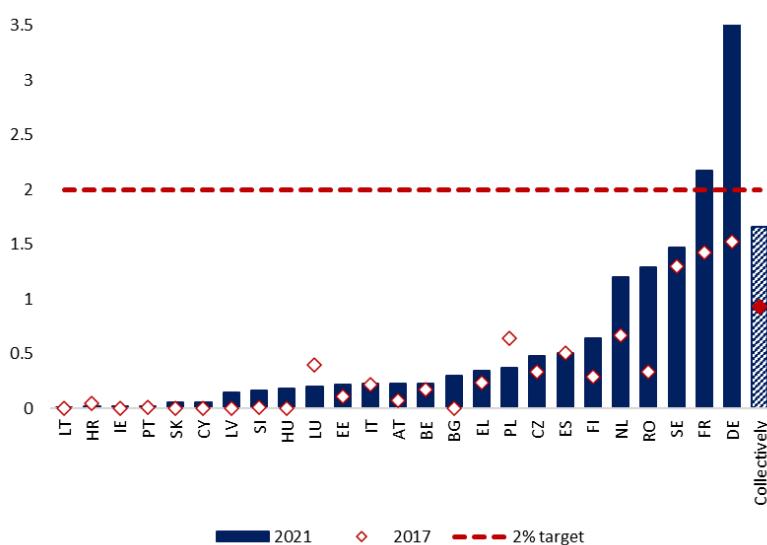


Source: own elaborations on EDA defence data

Note: Malta did not commit to any specific target as it is not among the PESCO participating members and not a NATO ally.

A positive trend is also the one of defence expenditure on Research and Technology (R&T) (Graph 8). This component is expected to near 2% of total defence expenditure by all Member States (European Council, 2017). Collectively the percentage spent on this item is equal to 1.7% in 2021 with an improvement of 0.7pp compared to 2017. At country level, three quarters of EU Member States have increased their spending on this item since 2017. Only two countries (Germany and France) had reached the 2% target in 2021 individually.

Graph 8. **Defence Research and Technology (R&T) expenditure (2021, % of total defence expenditure)**



Note: the data for Latvia and Slovakia are not available for 2017 while no data are available for Denmark for both years as Denmark joined PESCO only in May 2023. Malta is not among the PESCO participating members and so there is not commitment to any specific target.

Source: Own elaborations on EDA defence data.

3. WHAT IS THE ROLE OF THE EU BUDGET?

The EU does not have the legal competence to act on behalf of the Member States in defence; for this reason, defence policy in the EU is mostly coordinated through intergovernmental agreements. Decisions on the Common Defence and Security Policy (CSDP)¹⁷ are taken by the Council by unanimity. The CSDP was introduced with the Maastricht Treaty (1992) and its development (see Box.1) is characterised by two phases: the focus on crisis management prevailing during the 1990s–2000s and the period since 2014 with a greater attention given to deterrence and collective defence (Major and Mölling, 2020).

In line with Treaty limitations (TEU, Art. 41), the EU budget can only cover the operating expenditure for civilian CSDP missions¹⁸ that contribute to maintaining regional and global security and stability, whereas the operations that have military or defence implications cannot be borne by the EU budget. In particular, the Council of the European Union established in 2004 a specific mechanism called Athena¹⁹, to finance the common costs²⁰ associated with such operations, as well as the individual costs, such as lodging, fuel and other expenses related to national contingents. This off-budget account, funded by allocations from the Member States based on their gross national income, was replaced in 2021 by the European Peace Facility (EPF). Owing to the aforementioned Treaty limitations, the EPF has been still set outside the EU budget, even though its objectives reflect EU interest. Since its creation, the EPF has been mobilised to support military assistance measures in a number of third countries, and it has played a key role in supporting Ukraine in its response to the Russian invasion. In fact, whereas the financial ceiling of the EPF was €5.7 billion (in current prices) for the years 2021–2027 when it was established, it was increased to €8 billion in December 2022 and then to €12 billion in June 2023 to ensure that additional financial needs can be covered.

The 2021–2027 multiannual financial framework includes for the first time a heading (heading 5)²¹ dedicated to Security and Defence (European Commission, 2021). Heading 5 is the smallest of all headings, accounting for 1.2% of the overall budget. In particular, the defence programmes cover 65% of the amount dedicated to this heading, the bulk of it going to the European Defence Fund-EDF (€ 7.29 billion in current prices) and Military mobility (€ 1.75 billion in current prices).

The European Defence Fund (EDF) co-finances Member States' defence capability development costs (one third of its envelop) and provides funding for cooperative defence research initiatives at all levels of research and development (two thirds). This fund combines two pre-existing programmes financed by the 2014–2020 MFF as trial or preparation actions, the Preparatory Action on Defence Research-PADR and the European Defence Industrial Development Programme, which used to be included in Heading 1: 'Smart and Inclusive Growth'.

Military mobility is financing projects for dual-use transport infrastructure under the Connecting Europe Facility (CEF), mostly on the railway and roads infrastructures across Europe, in order to make the movement of the European armed forces faster and on a sufficient scale to respond to crises erupting at and beyond the EU's external borders.

¹⁷ Up to the Lisbon treaty it was called Common foreign and security policy area.

¹⁸ The missions aim to improve security and strengthen the rule of law, supporting third countries in the fight against terrorism, people smuggling and organised crime, strengthening police and judicial authorities and monitoring compliance with international agreements".

¹⁹ EU (2014) The mechanism for financing military operations (Athena). Summaries of EU Legislation. <https://eur-lex.europa.eu/EN/legal-content/summary/the-mechanism-for-financing-military-operations-athena.html>.

²⁰ These costs include: HQ implementation and running costs, including travel, IT systems, administration, public information, locally hired staff, Force Headquarters (FHQ) deployment & lodging for forces as a whole, infrastructure medical services (in theatre), medical evacuation, identification, acquisition of information (satellite images) reimbursements to/from NATO or other organisations (e.g. the UN).

²¹ For a detailed description of the negotiations of this heading please see Mazur, S. (2021).

Finally, to address the EU's most urgent and critical defence capability gaps, the European Commission has put forward a proposal for a Regulation establishing the European defence industry reinforcement through common procurement act (EDIRPA²²), which would create a short-term joint defence procurement instrument and incentivise the EU Member States to procure defence products jointly, and the Act in Support of Ammunition Production (ASAP²³), a temporary instrument ensuring that the EU can ramp-up its production capacity. The ASAP Regulation was adopted on 20 July 2023 while the EDIRPA Regulation was adopted on 9 October 2023. Both ASAP and EDIRPA are financed via the EU Budget, with an envelope respectively of € 500 million and € 300 million.

4. THE DEFENCE-GROWTH NEXUS IN ADVANCED ECONOMIES

As the relevance of defence spending increases in the EU, so does the interest in its possible impact on growth. The question of whether and how defence spending might affect economic growth is therefore a salient one, despite not being a new one in the economic literature.

Empirical findings on the defence-growth nexus are not unanimous, according to most recent surveys. Little consensus exists on the existence of the relationship, as well as on its direction of causality and nature. Empirical results are inconclusive as the findings are dependent on the socio-economic development of the country(ies) involved, the horizon period and the methodology used.

In their meta-analysis of 32 empirical studies, Alptekin and Levine (2012) support the existence of a small positive effect, at least for developed countries, using the share of military expenditure in GDP as the independent variable. On a larger sample including developing countries (91 studies), Yesilyurt and Yesilyurt (2019) find no significant effect, considering not only as dependent variable the share of military expenditure in GDP but also other functions of it (logarithms, differences, etc.). On the contrary, Dunne et al. (2004) empirical findings show that such expenditures have an insignificant or negative impact on growth in the case of developing countries and a comparatively stronger negative effect in developed countries.

Dunne and Tian (2016), reviewing 168 studies, find that the horizon considered influences the results favouring a negative effect when using post Cold War data. Indeed, 53% of authors who used post-cold war data found that military spending had a negative impact on growth. Still, 44% of cross-country studies and 31% of case studies support a negative impact of military spending. Positive results appeared in only 20% of papers examined while about 40% reported ambiguous results. A result which seems to be confirmed by Santamaría et al. (2022). These authors find that 24.69% of 162 articles examined support the existence of a positive relationship between military spending and growth, 16% support a negative relationship while nearly 38% are either heterogeneous or inconclusive. The rest of the papers covered other types of effects.

According to Churchill and Yew (2018) who conducted a meta-analysis of the empirical literature on the military spending growth nexus using 48 primary studies, the positive effects of military expenditure on growth are more pronounced for developed countries than for less developed ones. In general, these authors point to a negative military expenditure-growth nexus, the magnitude of which is heavily influenced by study variations. They attribute this result to rising levels of military spending since 1998, as well as to government corruption.

Given the lack of a consensus on the link between defence spending and economic growth, we will first describe the key channels through which defence spending may affect economic growth, followed by a survey of the literature on the growth-nexus in advanced economies.

²² Regulation (EU) 2023/2418, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202302418

²³ Regulation (EU) 2023/1525 of the European Parliament and of the Council of 20 July 2023 on supporting ammunition production (ASAP), <https://eur-lex.europa.eu/eli/reg/2023/1525/oj>

4.1 HOW CAN DEFENCE AFFECT ECONOMIC GROWTH?

The literature suggests three main channels²⁴ through which defence spending may affect economic growth: demand, supply and security (Dunne et al, 2005).

4.1.1 Demand channel

The Keynesian theory assumes a positive effect on output, whereas the authors of the "neoclassical synthesis" assume a negative effect. According to the Keynesian theory if aggregate demand is lower than supply, any rise in military spending increases capital stock utilisation and supports higher employment, resulting in higher profit rates, and higher investments, generating short-run multiplier effects and higher growth rates. (Benoit, 1978; Smith, 1980; Faini et al., 1984). This is true as long as the increased demand does not exceed potential supply, thereby generating excessive inflation, whose effects on growth are contradictory (Deger and Smith, 1983; Starr et al; 1984). Indeed, inflation may either force savings or may cause increased profitability.

On the contrary, the authors of the "neoclassical synthesis" expect a negative impact of the military burden on the demand side due to crowding-out effects. Not only does any increase in defence imply fewer resources for other public expenditures, but it also has a negative impact on private investment due to higher interest rates. According to Smith (1977) the crowding-out effect would be detrimental to total investment, whereas Edelstein (1990) observes that it would be detrimental to both private and public consumption. Still, the extent and form of crowding-out is influenced by how the military spending is financed and depends on prior utilisation of resources (Dunne et al.; 2005). If defence spending increases are accompanied by tax increases or deficit spending, economic prosperity may suffer as interest rates rise, investment and consumer demand fall and the economic growth slows (Borch and Wallace, 2010).

4.1.2 Supply channel

The supply channel operates through the availability of factors of production (labour, physical and human capital and natural resources) and technology. The resources used by the military are not available for civilian use, hence the opportunity cost of military spending. Some of the demand effects (e.g., crowding out of investment) may have also supply effects by changing the capital stock. So, opportunity costs may include adverse balance of payments in arms importing countries, inefficient bureaucracies (i.e., extensive rent seeking), fewer civilian public sector services, depleted R&D activities, and reduced skilled workforce in the civilian sector (Mylonidis, 2006). Still, a rise in defence spending via military imports may crowd-out civilian imports and reduce foreign saving (or foreign direct investment).

Some authors (Deger and Sen, 1995) suggested that negative externalities may occur if military spending is accompanied by arms production as an import substituting industrial strategy may be followed by curtailing export promotion as well as other sectors (i.e., agriculture), which could be especially detrimental to developing-country growth. According to these authors, the growth of the government sector (particularly the military sector) has little measured productivity increases; thus, its relative expansion will slow growth.

The military sector can have a modernising effect. Training of the armed forces affects labour force skills (MacNair et al., 1995) and, at least in the post-World War II decades, R&D military spending, resulting in the development of new technology (i.e., radar, jet engines, nuclear energy), may favour

²⁴ For other classification of the channels see Deger and Smith (1983), Deger and Sen (1995) and Smith and Smith (1980).

commercial spin-offs. (Dunne et al. 2005). In this respect, over time, the military R&D spillovers (direct, indirect, informational and organizational) to the civilian sector declined because of the increased level of specialization of defence R&D and its limited relevance to commercial industry. Still, since the 1990s civilian technology have been ahead of the military ones (Dunne, 2015), and this has led to a reverse process of exploiting civilian-based advanced technologies for military use ("military–civil fusion") (Evron and Bitzinger, 2023). Military R&D may have strong beneficial effects for the civil sector early in the life cycle of a technology, when the basic principles of a technology are not yet well-known (Cowan and Foray, 1995). More generally, the case exists of certain research projects that are unlikely to be carried out in the private sector because of their high-risk environment and public-good characteristics (Benoit, 1978; Mazzucato, 2013). Then, according to Benoit (1978) military spending can also have an impact on the organisational skills and attitudes, aiding in the breakdown of social rigidities and favouring a modernising effect. More broadly, it can be linked to infrastructure development, which has positive externalities on productivity (Benoit, 1978).

Thus, there is evidence of 'crowding in' effects of public defence-related R&D investment on private R&D. Increases in government-funded R&D for an industry or a firm result in significant increases in private sector R&D in that industry or firm, with evidence of international spillovers in the same industry in other countries and positive effects on overall productivity growth (Moretti et al., 2021).

4.1.3 Security channel

Military spending is a tool for providing security, which creates the conditions for economic development.²⁵ Indeed security is critical to the functioning of markets and favours investment and innovation, leading to higher economic growth (Thompson, 1974). As a result, wars and a lack of security may become impediments to economic development, in particular in less advanced economies. In this respect, Aizenman and Glick (2003) find that high military spending increases economic growth in case of high military threats while decreasing it if a country experiences high levels of corruption.

Military expenditures, on the other hand, can spark arms races or damaging wars when they are motivated by rent seeking rather than security needs. In this case, lower military spending is expected to be accompanied by the so called "peace dividend". As observed by Dunne (2000) advanced economies generally failed to benefit from the cuts because the savings were not reallocated to other expenditures. Policies favouring structural adjustments should be supported in such circumstances as observed by Dunne and Willet (1992)

Military spending implies an increased international respect which can encourage foreign investments and aid. Such benefits can be offset by the increased likelihood of conflicts which the dependency on aid can cause, as well as by the damaging effects multinational investment and aid can have on weak economies (Smith and Smith, 1980).

Seemingly, military spending can support the formation of strong states capable of reducing internal conflicts, exerting control over opposition, breaking worker resistance and modernising (Smith and Smith, 1980). Military governments, on the other hand, can seriously damage the economy (Smith and Smith, 1980), in particular for developing countries at least in the short term (Dunne, 2012).

4.2 IS THERE A CAUSAL RELATION BETWEEN DEFENCE SPENDING AND ECONOMIC GROWTH?

The empirical studies on the causal relation between defence spending and economic growth are mixed. Thus, although military expenditures may affect growth through three mechanisms as previously

²⁵ According to Adam Smith one of the three main duties of a state is "the duty of protecting the society from the violence and invasion of other independent societies" (Smith, 1901: p.160).

mentioned, it is also plausible that economic growth may be causally prior to military spending (Joerding, 1986). As a result, the causal ordering between growth and military spending can be of four types: i) bidirectional causality, ii) unidirectional causality from growth to defence expenditure; iii) unidirectional causality from defence expenditure to growth; iv) no causal relationship.

Empirical findings are spread over the four types. Bidirectional causality is supported by the findings of Chang et al (2014) for Japan and the USA, Kollias et al. (2004a) for Cyprus in a study covering the period 1964–99; Malizard (2010; 2013) for France during 1960–08 and 1960 to 2010; Lee and Chen (2007) for 27 OECD countries; Dunne and Nikolaïdou (2001a; 2005) for Greece and Lobont et al. (2019) for Romania.

One-way Granger causality running from military spending to economic growth is found by Chang et al (2014) for Canada and UK and by Dunne and Nikolaïdou (2001a) for Spain; by Canbay et al. (2021) for Canada, Germany, Japan, England, USA; Paparas et al. (2016) for Greece and by Yilgor (2011) for 11 Nato countries.

One-way Granger causality running from growth to military spending is instead found by Dunne and Nikolaïdou (2005) for Spain and Portugal and by Chang et al. (2015) for EU 15 countries, by Kollias and Paleologou (2013) for the US. This result would imply that defence expenditure “is primarily determined by economic factors rather than geopolitical and security considerations” (Chang et al.; 2015)

Still the neutrality hypothesis is observed by Chang et al. (2014) for France, Germany, and Italy; by Dunne and Nikolaïdou (2001a) for Portugal and by Canbay et al. (2021) for Italy and France, by Kollias and Makrydakis (1995) for Greece and by Kollias et al. (20014b) for France, Finland and Portugal, Belgium and Ireland; Kinsella (1990) and Smith and Tuttle, (2008) for US; Madden and Haslehurst (1995) for Australia. However, while for developing or low-income countries this relationship could be explained by the fact that military spending may be primarily related to security, for more advanced economies it could be also the expression of the rent seeking behaviour by the military elites (Kollias and Paleologou, 2013).

Kollias et al. (2004b) for EU 15 find mixed results. They find that for half of the countries the prevalent direction of causality is from growth to military expenditure (Germany, Italy, the Netherlands, Spain, Sweden, UK and Greece), while for the others either bidirectional causality (Austria, Denmark and Luxemburg) or no causal relation (Belgium, Ireland, France, Finland and Portugal) is detected. The results for Greece are confirmed by Dritsakis (2004) so no long-run relationship exists between economic growth and defence spending and the causality is unidirectional. On the contrary, Dunne and Nikoliadou (2001a) instead find the existence of a negative long run relationship using Granger causality methods within a cointegrating VAR. The same authors raise the attention on problems of drawing inferences across even relatively homogeneous economies as the causality tests by using different methods are not consistent.

Table 1. Causality direction according to the literature

Authors	Causality direction
Kollias et al. (2004b) ; Dunne and Nikolaïdou (2001a; 2005) ; Lee and Chen (2007); Atesoglu, (2002; 2009); Malizard, J. (2010); Malizard, J. (2013); Chang et al, (2014); Lobont et al. (2019)	Bidirectional
Kollias et al. (2004b); Dritsakis (2004); Nikoliadou (2005); Smith and Tuttle (2008); Kollias and Paleologou (2013); Chang et al, (2014)	Unidirectional from growth to military spending

Dunne and Nikolaïdou (2001a) ; Chang et al. (2015) ; Paparas et al (2016) ; Canbay et al. (2021)	Unidirectional from military spending to growth
Kinsella (1990); Kollias and Makrydakis (1995); Madden and Haslehurst (1995); Dunne and Nikolaïdou (2001a); Kollias et al. (2004b); Chang et al, 2014; Canbay et al. (2021)	No causality

Source: own elaborations.

4.3 A SURVEY OF THE LITERATURE ON ADVANCED ECONOMIES

The empirical evidence on single advanced countries is mixed and varies depending on the methodology and time horizon considered. Nincic and Cusack (1979) in a study conducted on US data (1949–1976) find a positive relation between military spending and economic growth. Still, they suggest that non-military spending is more effective in countering stagnation. A very small, growth-promoting impact is also observed by Atesoglu and Mueller (1990) by applying a two-sector model of Biswas and Ram (1986) and by Ando (2018) for the same country, over 1949–89 and 1965–2014 respectively. Ando (2018) also finds no externality from the defence expenditure to the private sector by using a three-sector Feder–Ram model. Still on US data, significant positive long-run relationship is also observed by Atesoglu (2002; 2009) over different horizons: 1947–2000 and 1948–2007, by using a multivariable reduced-form Keynesian model, and by Bremmer and Kesselring (2007) over the period 1963 to 2005. A non-linear relationship is instead found by Cuaresma and Reitschuler (2003) by adding a growth equation to the production function framework of Feder (1983). The effect of defence spending on growth seems non-linear and dependent on the level: they find that defence spending has a positive effect at low levels of expenditure while reverting to a negative effect for higher levels.

Table 2 summarises the empirical findings of the nexus defence expenditure –growth in advanced economies.

Table 2: **Summary table on effects on growth**

Authors	Effects on growth
Nincic and Cusack (1979); Ahmed (1986); Atesoglu and Mueller (1990); MacNair et al. (1995); Landau (1996); Atesoglu, (2002;2009); Cuaresma and Reitschuler (2003); Dunne and Nikolaïdou (2001a ; 2005); Bremmer and Kesselring (2007); Lee and Chen (2007); Kollias et al (2007); Pieroni, d'Agostino and Lorusso, (2008); Yilgör et al. (2012); Ando (2018) ; Daddi et al. (2019); Lobont et al. (2019);Canbay et al. (2021);	Positive
Szymanski's (1973); Cappelen, et al (1984); Ward and Davis (1992); Landau (1996); Antonakis (1997); Bremmer and Kesselring (2007); Chang et al. (2014); Dunne and Nikolaïdou (2001a and b) ; Cuaresma and Reitschuler (2003); Ocal and Brauer(2007); Mylonidis, (2008); Chang et al. (2011); Dunne and Nikolaïdou (2012)Hou and Chen (2014); Canbay et al. (2021); Paparas et al. (2016);	Negative
Mintz and Huang (1990;1991); Heo (2000;2010); Dunne and Nikolaïdou (2001a); Kollias et al. (2004b); Smith and Tuttle, (2008) Dunne and Nikolaïdou (2012); Kollias and Paleologou (2013); Chang et al. (2014); Kollias and Paleologou (2016); Canbay et al. (2021)	Neutral

Source: own elaborations.

Military spending is found instead to be negative for growth, in the case of the US, by Ward and Davis (1992), but they also find that it generates positive externalities independently from its size. Mintz and Huang (1990; 1991) find no direct impact of military spending on growth, but only an indirect one. Indeed, lower military spending in the long run favours investments and so supports economic growth, although the effect is not immediate, but delayed by five years. No significant effect is found by Heo (2000; 2010).

Studies that focused on advanced countries like Canada and UK, point to ambiguous results too. Bremmer and Kesselring (2007) find for Canada a positive relation between military spending and GDP growth, while Chang et al. (2014) and Canbay et al. (2021) find opposite results on more recent data (1988–2010 and 1988–2018 respectively). The same authors find also a negative military spending/growth nexus for the UK. The opposite is true according to Ahmed (1986) and Pieroni et al. (2008) for the same country. The latter find that the relationship between defence spending and output is strongly sample-dependent, with a fall in the elasticity values in more recent years, for the UK and the US.

Antonakis (1997) uses a two sectors model to show that military expenditures delay economic growth in Greece through the combined relative factor productivity differential and the externality effect of the defence sector. This result is confirmed by Dunne and Nikolaïdou (2001b), by using a four-equation system to model, and by Paparas et al. (2016), by using the Engle-Granger estimations. In particular Dunne and Nikolaïdou (2001b) find both negative direct and indirect effects (through savings and trade balance) of defence spending on economic growth. The first would imply the absence of positive spin-offs or externalities while negative indirect effect though savings implies the existence of a crowding-out phenomenon. On the contrary, according to Dunne and Nikolaïdou (2001a), who use a Granger causality methods within a cointegrating VAR framework over the horizon 1960–1996, military spending supports growth in the short term. The long-run relation is instead negative for Greece and Spain, while positive for Portugal.

Canbay et al (2021) using bootstrap panel causality analysis for the period 1988–2018, find a positive relation for Germany and Japan. Daddi et al. (2018) by using an endogenous growth model find a positive relation for Italy over the period 1960–2009. Similar positive relation is observed by Lobont et al. (2019) for Romania over the period 1991–2016.

The results based on aggregate of countries are also mixed. Szymanski's (1973) comparative study of 18 capitalist countries was one of the first to examine the outcomes of military spending. He finds that military spending has a more pronounced effect on reducing the unemployment than non-military spending. Still, contrary to non-military expenditure, military spending seems to hinder economic growth. Cappelen et al. (1984) over the period 1960–1980, for a sample of 17 OECD countries, find a positive impact on manufacturing output, but a negative effect on investment and so an overall negative effect on economic growth, except for the Mediterranean countries. A positive impact is also found by MacNair et al. (1995) for 10 NATO countries and by Yilgör et al. (2012) for 11 NATO countries and by Lee and Chen (2007) by considering 27 OECD countries over a more recent period (1988–2003). MacNair et al. (1995) observe also a small negative defence externalities implying a sort of substitutability among the defence efforts. According to Hou and Chen (2014) the relationship is instead negative when considering twenty-one OECD member countries in the period 1960–2009, by using Augmented Solow methodology.

Gómez-Trueba Santamaria et al. (2021) find that during the first year, there is a positive impact of the military expenditure on GDP, which becomes blurred within the following years. Still positive appear the effect on growth and investment of military spending on 30 high-income countries according to Kollias and Paleologou (2013). Anyway, military spending shocks are short-lived, they have a noticeable influence on the economy only in the first year, and they are fully absorbed within four years.

Landau²⁶ (1996) finds a non-linear relationship between military spending and growth in 17 wealthy OECD countries during the period of 1950–1990. This implies that at low levels of military spending the net effect on growth is positive, but after reaching a maximum it would turn negative.

Panel estimates based on EU15 countries over the period 1961–2000 (Kollias et al.; 2007) support the idea that military spending induces growth both in the short and long run. On the contrary, Mylonidis (2008) and Chang et al. (2011), considering a sample of 14 and for 22 European countries, find a negative influence of defence on economic growth for the period 1960–2000 and 1992–2006 respectively. Furthermore, Mylonidis (2008) observes how the magnitude of this negative impact tends to increase over time. Still negative or neutral is the effect estimated by Dunne and Nikolaïdou (2012) employing an augmented Solow-Swan model for EU15 over the period 1961–2007. The neutrality of the relationship is also supported by Kollias and Paleologou (2016) employing a panel vector autoregression methodology for the case of the EU15 countries over the period 1961–2014.

5. CONCLUSION

This paper has provided evidence that almost all national budgets of EU Member States have boosted military spending in recent years and are planning to increase it further in the near future. From an economic standpoint, it is impossible to determine if this tendency is favourable or negative to growth. The literature is mixed about the existence of a causal relationship between defence spending and economic growth, as well as about the direction of the relationship. Although favourable impacts are more frequently reported in advanced economies than in less developed ones, the outcomes are dependent on the time horizon and on the methodology used.

The articulation across different budgetary authorities in a multilevel governance system like the EU is of fundamental importance. Not only because of efficiency concerns in terms of public expenditure, but also and mainly for the sake of effectiveness of the overall defence policy. A solid convergence of policy objectives, however, remains a pre-condition for budgetary integration in this area. In the EU, defence policy is almost entirely the responsibility of the Member States. The Union's budget cannot be utilised for "expenditure arising from operations having military or defence implications" (Art. 41 (2), TFEU). Lately an off-budget device has been devised to overcome this limitation and the discussion about future budgetary instruments greatly depends on this point.

The institutional evolution of defence policy in the EU tries to build on a progressive convergence of foreign policy objectives across Member States. The main questions for the future of the EU common defence policy are to what extent this convergence will hold in the new, challenging geopolitical context and, if so, to what extent it will be reflected in new provisions for defence spending in the common budget.

Further research could shed light on the political economy of defence spending in a multilevel governance system, like the European Union, in which supranational budgetary power is delegated from the national level only to a limited extent, and in which foreign policy interests of the national government may not always be aligned.

²⁶ The non linearity is also observed by Stroup and Heckelman (2001); Cuaresma and Reitschuler (2004); Aizenman and Glick (2006) and d'Agostino et al., (2012).

REFERENCES

- Ahmed, S. (1986), "Temporary and permanent government spending in an open economy", *Journal of Monetary Economics*, 17 (2): 197–224.
- Aizenman, J. and R., Glick (2006). "Military expenditure, threats, and growth", *J. Int. Trade Econ. Dev.* 2006; 15(2): 129–155.
- Alexander, W.R.J. (1990) "The Impact of Defence Spending on Economic Growth: A multi-sectorial approach to defence spending and economic growth with evidence from developed economies". *Def. Peace Econ.*, 2(1): 39–56.
- Alptekin, A., and P. Levine. (2012). "Military Expenditure and Economic Growth: A Meta-analysis". *European Journal of Political Economy* 28 (4): 636–650.
- Ando J. (2018). "Externality of defence Expenditure in the United States: A New Analytical Technique to Overcome Multicollinearity", *Defence and Peace Economics*, 29(7), 794–808.
- Antonakis, N. (1997) "Military Expenditure and Economic Growth in Greece, 1960–1990", *Journal of Peace Research*, 4 (1), 89–100.
- Atesoglu H.S. and M. Mueller (1990), "Defence Spending and Economic Growth", *Defence Economics*, 2(1):19–28.
- Atesoglu H.S. (2002)." Defence spending promotes aggregate output in the United States-evidence from cointegration analysis". *Defence Peace Econ*,13(1): 55–60.
- Atesoglu, H. S. (2009). "Defence Spending and Aggregate Output in The United States", *Defence and Peace Economics*, 20(1): 21–26.
- Becker, J. (2017) "The correlates of transatlantic burden sharing: revising the agenda for theoretical and policy analysis", *defence & Security Analysis*, 33 (2), 131–157.
- Becker, J. M. (2019). "Accidental rivals? EU fiscal rules, NATO, and transatlantic burden-sharing", *Journal of Peace Research*, 56(5) 697–713.
- Becker J. and J. P., Dunne (2021). "Military Spending Composition and Economic Growth", *Defence and Peace Economics*, 34(3): 259–271.
- Becker, J., Benson, S., Dunne, J. P., and Malesky, E. (2024). "Disaggregated defense spending: Introduction to data". *Journal of Peace Research*. <https://doi.org/10.1177/00223433231215785>
- Benoit, E. (1978). "Growth and defence in developing countries." *Economic Development and Cultural Change*, 26: 271–280
- Biswas, B. and R., Ram (1986). "Military expenditures and economic growth in less developed countries: An augmented model and further evidence". *Econ. Dev. Cult. Change*, 34(2): 361–372.
- Borch, C. and M. Wallace (2010). "Military spending and economic well-being in the American states: the post-Vietnam war era". *Soc. Forces*, 88(4):1727–1752.
- Canbay, Ş., Kirca, M. and E., Oflaz (2021). "Relationships Between Defence Expenditures and Economic Growth in G7 Countries: Panel Bootstrap Causality Analysis". *Bingöl Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 5 (1): 119–140.
- Cappelen, Å., Gleditsch, N. P., and O. Bjerkholt. (1984). "Military Spending and Economic Growth in the OECD Countries", *Journal of Peace Research*, 21(4)/ 361–373.
- Chang, H.-C., Huang, B.-N. and C.W., Yang (2011). "Military expenditure and economic growth across different groups: a dynamic panel Granger-causality approach", *Econ. Modell.*, 28/ 2416–2423.
- Chang, T.; Lee, C.-C. and H.P., Chu (2015). "Revisiting the defence–Growth nexus in European countries", *Defence and Peace Economics*, 26(3): 341–356.

Chang, T.; Lee, C.C.; Hung, K. and K.H., Lee (2014). "Does Military Spending Really Matter for Economic Growth in China and G7 Countries: The Roles of Dependency and Heterogeneity", *Defence and Peace Economics*, 25(2): 177-191.

Churchill, A.S. and S.L., Yew, (2018). "The effect of military expenditure on growth: an empirical synthesis", *Empir Econ*, 55:1357–1387.

Council of the European Union (7371/22). "A Strategic Compass for Security and Defence - For a European Union that protects its citizens, values and interests and contributes to international peace and security". <https://data.consilium.europa.eu/doc/document/ST-7371-2022-INIT/en/pdf>.

Council decision (CFSP) 2017/2315 of 11 December 2017.

Council (2002), General Affairs Council, Luxembourg 17 June 2002 "ESDP – Financing of operations having military implications", Presidency conclusions, European Council Seville 21-22 June 2002 Annexe II in Haine, J.Y. (2003) "From Laeken to Copenhagen European Defence: core documents volume III" Chaillot Paper n° 57 Paris, EU Institute for Security Studies.

Cowan, R. and D., Foray (1995). "Quandaries in the economics of dual technologies and spillovers from military to civilian research and development", *Research Policy*, 24(6): 851-868.

Cuaresma, J.C. and G., J.C. Reitschuler (2003). "A non-linear defence-growth- nexus? Evidence from the United States economy", *Defence and Peace Economics*, 15(1): 71–82.

d'Agostino, G.; Dunne, J. P. and L., Pieroni (2017). "Does Military Spending Matter for Long-run Growth?", *Defence and Peace Economics*, 28(4): 429-436.

d'Agostino, G., Dunne, J.P. and L, Pieroni (2012). "Corruption, military spending and growth". *Def Peace Econ*, 23(6): 591–591.

Daddi, P.; d'Agostino, G. and L., Pieroni (2018). "Does military spending stimulate growth? An empirical investigation in Italy", *Defence and Peace Economics*, 29 (4): 440-458.

Deger, S. and R., Smith (1983). "Military expenditure and growth in less developed countries", *J. Conflict Resolut*, 27(2): 335–353.

Deger, S. and S., Sen (1995). "Military Expenditure and Developing Countries". *Handbook of Defence Economics*, Volume 1.

Dritsakis, N. (2004). "Defence spending and economic growth: An empirical investigation for Greece and Turkey", *Journal of Policy Modeling*, 26: 249–264.

Dunne, P. (2000) *The Economic Effects of Military Expenditure in Developing Countries*, mimeo.

Dunne, J. P., & Nikolaïdou, E. (2001a). *Military Spending and Economic Growth in the Peripheral Economies of Europe: A Casual Analysis for Greece, Spain and Portugal*. Middlesex University Business School.

Dunne, J.P & E. Nikolaïdou (2001b) "Military expenditure and economic growth: A demand and supply model for Greece, 1960–96", *Defence and Peace Economics*, 12:1, 47-67.

Dunne, J.P., and S. Willett (1992), "Disarming the UK: The economics of conversion", Discussion Paper No. 2.

Dunne, P; Smith, R. and D., Willenbockel (2005). "Models of Military Expenditure and Growth: A Critical Review", *Defence and Peace Economics*, 16 (6),: 449–460.

Dunne, P. and E., Nikolaïdou (2005). "Military Spending and Economic Growth in Greece, Portugal and Spain," *Frontiers in Finance and Economics*, SKEMA Business School, vol. 2(1), 1-17.

Dunne, J.P; and M., Uye (2010). "Military Spending and Development". In: Andrew T, editor. *The Global Arms Trade*. London, UK: Europe/Routledge.

Dunne, J.P. and E., Nikolaïdou (2012). "Defence Spending and Economic Growth in The EU15", *Defence and Peace Economics*, 23:6, 537-548.

Dunne, J.P. (2012). "Military Spending, Growth, Development and Conflict", Defence and Peace Economics, 23(6): 549-557.

Dunne J.P. and N., Tian (2013). "Military expenditure and economic growth: A survey". The Economics of Peace and Security Journal, 8(1): 5–11.

Dunne, J. P., and N., Tian (2016). "Military Expenditure and Economic Growth 1960–2014." Economics of Peace and Security Journal 11 (2): 50–56.

Dunne, J. P. (2015). "Sector Futures: Defence industry. European Monitoring Centre on Change", Eurofund, <https://www.eurofound.europa.eu/observatories/emcc/articles/business/sector-futures-defence-industry>

Edelstein, M. (1990). "What price cold war? Military spending and private investment in the U.S., 1946–1979", Cambridge Journal of Economics, 14 (4): 421-437.

European Commission (2017) JOIN. 41 final Improving Military Mobility in the European Union. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017JC0041>.

European Commission (2018) JOIN. 5 final On the Action Plan on Military Mobility. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=JOIN%3A2018%3A5%3AFIN>.

European Commission (2022) JOIN. 48 Action plan on military mobility 2.0. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=JOIN%3A2022%3A48%3AFIN>.

European Commission (2022) JOIN. 24 final On the Defence Investment Gaps Analysis and Way Forward. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022JC0024>.

European Council (1999a). Declaration of the European Council on Strengthening the Common European Security and Defence" European Council, Cologne 3-4 June 1999 in Rutten, M. (2001) "From St-Malo to Nice European defence: core documents" Chaillot Paper n° 47, Paris, EU Institute for Security Studies.

European Council (1999b) PRESIDENCY CONCLUSIONS, HELSINKI
https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/ACFA4C.htm.

European Defence Agency (2018) Factsheet: Capability Development Plan. https://eda.europa.eu/docs/default-source/eda-factsheets/2018-06-28-factsheet_cdpb020b03fa4d264fa776ff000087ef0fEuropean.

External Action Service (2022) A Strategic Compass for Security and Defence, Brussels. https://www.eeas.europa.eu/eeas стратегический компас безопасности и обороны_en.

European Defence Agency (2021) Annual report, Brussels.

Evron, Y. and R. A., Bitzinger (2023). "The Fourth Industrial Revolution and Military-Civil Fusion: A New Paradigm for Military Innovation?", Cambridge University Press.

Faini R., Annez P. and L. Taylor (1984). "Defence spending, economic structure and growth: evidence among countries and over time". Econ. Dev. Cult. Change, 32(3): 487–498.

Giegerich, B. and W., Wallace (2004). "Not such a soft power: the external deployment of European forces", Survival, 46:2, 163-182.

Gómez-Trueba Santamaría, P., Arahuetes García, A. and T., Curto González (2021). "A tale of five stories: Defence spending and economic growth in NATO's countries". PLoS ONE 16(1): e0245260. <https://doi.org/10.1371/journal.pone.0245260>.

Graf von Kielmansegg, S. (2019). "The Historical Development of EU Defence Policy: Lessons for the Future?", VerfBlog, 2019/3/25, <https://verfassungsblog.de/historical-development-lessons-for-the-future%ef%bb%bf/>.

Heo, U. (2000). "The defence-growth Nexus in the United States Revisited", American Politics Research 28(1):110-127.

Heo, U. (2010). "The Relationship between defence Spending and Economic Growth in the United States", Political Research Quarterly, 63(4): 760-770.

- Hou, N. and B., Chen (2014). "Military expenditure and investment in OECD countries: Revisited. Peace Econ. Peace Sci. Public Policy, 20(4): 621–630.
- Hewitt, D. (1992). "Military Expenditures Worldwide: Determinants and Trends, 1972-1988", Journal of Public Policy, 12(2): 105-152.
- Hitch, C. and R., McKean (1961). "The Economics of defence spending in the nuclear age". Cambridge: Harward university press.
- Holcner, V., and J., Neubauer (2015). "Modelling Expected defence Specific Inflation." In: Proceedings of the International Conference on Numerical Analysis and Applied Mathematics 2014 (ICNAAM-2014), AIP Conference Proceedings, 1648.
- Hou, N. andB., Chen (2013). "Military expenditure and economic growth in developing countries: Evidence from system GMM estimates". Def. Peace Econ., 24(3): 183–193.
- Huang, C. and A., Mintz (1990). "Ridge regression analysis of the defence-growth trade-off in the United States". Def. Peace Econ., 2(1): 29–37.
- Huang, C. and A., Mintz (1991). "Defence expenditures and economic growth: The externality effect", Def. Peace Econ., 3(1): 35–40.
- Kinsella, D. (1990). "Defence spending and economic performance in the United States: A causal analysis," Defence Economics, 1(4): 295-309.
- Kollias, C. and S., Makrydakis (2000) "A note on the causal relationship between defence spending and growth in Greece: 1955–93", Defence and Peace Economics, 11(1): 173-184.
- Kollias, C., C. Naxakis, and L., Zarangas (2004a). "Defence spending and growth in Cyprus: A causal analysis." Defence and Peace Economics, 15 (3): 299–307.
- Kollias, C., Manolas, N. and S.M., Paleologou (2004b). "Defence expenditure and economic growth in the European Union. A causality analysis", Journal of Policy Modeling, 26 (5): 553-569.
- Kollias, C., Mylonidis, N. and S.M., Paleologou (2007). "A panel data analysis of the nexus between defence spending and growth in the European Union", Defence and Peace Economics, 2007, 18(1): 75–85.
- Kollias, C. and S.M., Paleologou (2013). "Guns, highways and economic growth in the United States", Economic Modelling, 30, 449-455.
- Kollias, C. and S.M., Paleologou (2016). "Investment, growth, and defence expenditure in the EU15: Revisiting the nexus using SIPRI's new consistent dataset", The Economics of Peace and Security Journal, 11(2).
- Landau, D. (1996). "Is one of the 'peace dividends' negative? Military expenditure and economic growth in the wealthy OECD countries". Quarterly Review of Economics and Finance. 36(2): 183–195.
- Lindstrom, G. (2021). "History and Development of the CSDP". In Handbook on CSDP – The Common Security and Defence Policy of the European Union- 4th Edition, ed. J. Rehrl, Directorate for Security Policy of the Federal Ministry of Defence of the Republic of Austria, chapter 1: 16-21.
- Lazarou, E. and A., Dobreva (2019). "Security and defence, Briefing EU policies – Delivering for citizens", European Parliament.
- Lee, C.C. and S.T., Chen (2007). "Do defence expenditures spur GDP? A panel analysis from OECD and non-OECD countries", Defence and Peace Economics, 18 (3): 265-280.
- Lobont, O.R., Glont, O.R., Badea L. and S., Vatavu (2019). "Correlation of Military Expenditures and Economic Growth: Lessons for Romania", Quality & Quantity " Quality & Quantity: International Journal of Methodology, 53(6): 2957-2968...
- MacNair, E., Murdoch, C. and T., Sandler (1995). "Growth and defence: Pooled estimates for the NATO alliance, 1951–1988.", Southern Economic Journal, 61(3): 846–860.

- Malizard, J. (2010). "Causality between economic growth and military expenditure: The case of France", Defence and Security Analysis, 26(4): 401–413.
- Malizard, J. (2013). "Opportunity Cost Of defence: An Evaluation in The Case of France", Defence and Peace Economics, 24 (3): 247-259.
- Mazur, S. (2021). "Security and defence Heading 5 of the 2021-2027 MFF", European Parliamentary Research Service.
- Mazzucato, M. (2013). "The Entrepreneurial State: Debunking the Public vs. Private Myth in Risk and Innovation". Anthem Press
- Mintz A., and C., Huang (1990). "Defence expenditures, economic growth, and the peace dividend". American Political Science Review, 84(4): 1283-1293.
- Mintz, A. and C., Huang (1991). "Guns versus Butter: The Indirect Link". American Journal of Political Science, 35 (3): 738-757.
- Moretti, E.; Steinwender, C. and J., Van Reenen (2019), "The Intellectual Spoils of War? defence R&D, Productivity and International Spillovers", NBER Working Paper No. 26438.
- Mylonidis N. (2008). "Revisiting The Nexus Between Military Spending and Growth in The European Union", Defence and Peace Economics, 19 (4): 265-272.
- Madden, Gary G. & Paula I. Haslehurst (1995) "Causal analysis of Australian economic growth and military expenditure: A note", Defence and Peace Economics, 6 (2): 115-121.
- NATO (2014). "Wales Summit Declaration Issued by the Heads of State and Government Participating in the Meeting of the North Atlantic Council in Wales." http://www.nato.int/cps/en/natohq/official_texts_112964.htm.
- Nincic, M. and T. R., Cusack (1979). "The Political Economy of US Military Spending", Journal of Peace Research, 16 (2), 101-115.
- Paparas, D., Richter, C. and A., Paparas (2016). "Military Spending and Economic Growth in Greece and the Arms Race between Greece and Turkey", Journal of Economics Library, 3(1): 38-56.
- Pieroni, L.; d'Agostino, G. and M., Lorusso (2008). "Can we declare military Keynesianism dead?", Journal of Policy Modeling, 30(5): 675-691.
- Puglierin, J. and P., Zerka, (2022). "European sovereignty index, European Council on foreign relations". <https://ecfr.eu/wp-content/uploads/2022/06/European-Sovereignty-Index.pdf>.
- Sandler, T. and J., George (2016). "Military expenditure trends for 1960–2014 and what they reveal", Glob Policy, 7: 174–184.
- Sköns, E., C. Perdomo, S. Perlo-Freeman, and P., Stalenheim (2004). "Military Expenditure." SIPRI Yearbook 2004: Armaments, Disarmament and International Security, 35: 305–338.
- Smith, R. (1977). "Military expenditure and capitalism", Cambridge Journal of Economics, 1 (1): 61-76.
- Smith, D. and R. Smith (1980). "Military Expenditure, Resources and Development", University of London, Birkbeck College Discussion Paper, No. 87, November.
- Smith R. P. (1980). "Military expenditure and investment in OECD countries, 1954–1973", J. Comp. Econ. 1980; 4(1): 19–32
- Smith, R. P. (1989). "Models of Military Expenditure." Journal of Applied Econometrics 4 (4): 345–359.
- Smith, R. (2007). "The demand for military expenditure". In Handbook of Defence Economics, Edited by: Sandler, T. and Hartley, K., Vol. 1, Amsterdam: North-Holland.
- Smith, J. S. and M.H., Tuttle (2008). "Does defence spending really promote aggregate output in the United States?", Defence and Peace Economics, 19(6):435-447.

- Starr H., Hoole F.W., Hart, J.A., et al. (1984). "The Relationship between defence Spending and Inflation", Journal of Conflict Resolution, 28 (1): 103–122.
- Szymanski, A. (1973). "Military Spending and Economic Stagnation", American Journal of Sociology, 79(1): 1-14.
- Thompson, E.A. (1974). "Taxation and national defence", Journal of Political Economy, 82: 755 782.
- Ward M.D. and D. R., Davis (1992). "Sizing up the Peace Dividend: Economic Growth and Military Spending in the United States, 1948-1996", The American Political Science Review, 86 (3): 748-755.
- Wyplosz, C. (2016). "The six flaws of the Eurozone", Economic Policy, 31(87): 559-606.
- Yesilyurt, F., and M. E., Yesilyurt (2019). "Meta-analysis, Military Expenditures and Growth", Journal of Peace Research, 56: 352–363.
- Yilgör, M., Karagöl, E. T., and Ç. A., Saygili (2014). "Panel causality analysis between defence expenditure and economic growth in developed countries", Defence and Peace Economics, 25(2): 193-203.

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