

Weaponizing Europe? Rule-Makers and Rule-Takers in EU Defense Markets

Kaija Schilde

Boston University

kschilde@bu.edu

How do modern states govern public security goods? Security state authority has multiple sources and ideal-typical forms: while traditional ‘positive’ security authority (PSS) generates and monopolizes state capacity to produce and own collective tools of force, security authority also emerges from regulation (RSS), when states incentivize and indirectly steer the provision of collective security goods by rule-making, even while the goods are produced or owned by other actors. Contemporary security state authority is based on both traditional and regulatory foundations, relying on both capacity to generate public goods owned by the state and the regulation of the security domain.

This special issue asks: to what degree is the European Union (EU) a security state with regulatory power? My contribution extends this question to the domain of traditional defense markets. I identify the history of the EU’s attempts to regulate arms production, tracing the EU as an increasingly robust market rule-maker over the means of force. I then evaluate whether EU rule-making efforts effectively influence the behavior of rule-takers (i.e. defense firms). The shadow of regulatory governance may be less directly visible than a traditional defense authority, but its brokering power should be observable in the behavior of market actors. A test of whether the EU has regulatory defense power is the degree to which European defense firms recognize and navigate it, particularly when taking into account firm investment strategies and expectations of future risk and competitiveness. Overall, I propose that the EU’s infrastructural power as a rule-making

Regulatory Security State (RSS) is evident in how it shapes the behavior and interests of a key set of rule-takers--defense firms operating in European defense markets.

This paper makes three contributions within the special issue and beyond. First, it identifies and fills a gap linking the regulation and governance literature to the domain of traditional defense capabilities. I theorize a defense governance spectrum of RSS and PSS authority rather than a binary category, and then locate the EU within that spectrum. I locate the EU as an ideal-typical RSS, but with nascent PSS authority: initiatives such as the European Defence Fund (EDF) give it a modest but direct material power over defense research and capabilities. On the other hand, ideal-typical PSS states also rely heavily on regulatory authority to govern defense markets. Indeed, the RSS framework explains outcomes in even the hardest-case defense PSS--the United States. This insight expands the relevance of the RSS special issue framework, even if it initially appears in tension with it. While the special issue frames regulation and capacity as two ideal types of governance, reflected in the RSS vs PSS ideal types, my contribution emphasizes the inherent link between regulation and capacity--in that regulation, not just material extraction, generates capacity--and illustrates the authority foundations of modern security states as a spectrum of regulatory to traditional authority. Even ideal typical PSS states outsource defense to private actors, lease instead of own defense equipment, and source services from the private sector (Franck & Melese, 2008).

My second and third contributions are specific to expanding and testing the special issue RSS framework. To evaluate the emergence and consolidation of an EU defense RSS, I trace the political development of the EU as a rule-maker in defense markets, proposing that EU defense regulation has shaped national and European defense markets independently of member state spending or capabilities.. Second, I go beyond tracing EU rule-making and evaluate the responses of

‘rule-takers’ (i.e. defense firms) in navigating EU defense market regulation. I identify shifting preferences for EU- over national-levels of governance and changes in defense firm behavior over time. Taken together, my findings suggest that firms have responded to EU regulation with decreased perceptions of future market risk. I introduce a novel indicator of firm behavior, specifically over risk perception: firm self-funding of technology from their own profits, called “internal R&D” (IR&D) (Bönte, 2003). IR&D investments have emerged and varied commensurate with EU regulatory authority, suggesting a response to EU rule-making by rule-taking firms. I hypothesize that European defense firms accept increasing enterprise risk in exchange for a (perceived) lower future market risk due to EU regulation. The EU may buy little defense equipment, but its regulatory authority assures firms of their future competitiveness inside Europe.

Rule-making and Rule-taking in Defense Markets

Defense markets are governed by the regulatory authority of their home states. States regulate defense arms export rules, procurement, research and innovation, intellectual property, firm ownership, and technology transfer law and policy. Defense markets are distinct from commercial markets because of the dependence of firms on their home state as primary customer (Bialos et al., 2009). Defense firms have low profit margin expectations in comparison to commercial firms, but they have high expectations of recouping profits over time due to their interdependence with home state customers (Rogerson, 1989). Future assurances, however, are not (only) in the form of future sales guarantees: robust regulation is also a means of risk management, altering firm behavior with assurances of future market boundaries or general demand (Marti Sempere 2017). Defense firms

accept the tradeoff of lower profit and heavy regulation for regulatory assurances of demand continuity or market supply, in the form of competition policy or protectionism (Mandelbaum & Lindblom, 1978).

Defense firm incentives, therefore, closely track home market regulatory governance. The cost risks of developing weapons platforms are high, given narrow profit margins, small production runs, and long lead times (Sandler & Hartley, 1995, p. 194). Weapons manufacturers depend on clear regulation over who, what, and how much to invest in future technologies (Smit et al, 1998). Close coordination allows firm investments to align with state security strategy, benefit from state-funded research and development (R&D), and profit from civilian market spin-offs in technology transfer (Weiss, 2014). Defense firms are generally “hesitant to reinvest their own capital in R&D [and] await demand signals from governments” in order to reduce their own long term “uncertainty regarding both budget and operational requirements”(CSIS, 2012). Firms only invest in technology out of their own profits when their risk analysis indicates recouping expenditures in future sales. Robust state regulation over defense markets assures firms that initial self-funding risks will pay off over time, due to the active governance of market boundaries and weapons system life cycles.

Market regulators provide structural coordination between firms and the state to sustain arms production by managing firm risk over the future (Mazzucato, 2016). The US case is illustrative here, for the purpose of theory-building: in addition to being a weapons customer, the US Defense Department is also a market regulator. US firms respond not just to the state as a major customer, but also as the regulatory entity shaping defense market access and boundaries. The US was not always a robust defense regulator; its regulatory authority has developed at key junctures, such as the 1949 creation of the Defense Department (Stuart, 2009); the 1986 Goldwater Nichols Act

centralizing defense acquisition processes and life-cycles (Locher, 2004); and the 1998 “Buy America” Act forbidding non-US firms as prime defense contractors and erecting regulatory barriers to the foreign direct investment of foreign defense firms in the US.

The regulatory power of the US shaped defense market outcomes as much as its direct material power. For example, in 1993, during defense spending downturns (and a 70% arms export decline) the Defense Department incentivized the consolidation of the American arms industry (Dowdy, 1997). In response, firms merged and partnered with other companies in joint procurement bids in order to offset domestic sales losses with increased revenue from international sales. The Defense Department also restructured the boundaries of defense markets by (partially) integrating them into civilian markets through the use of technology transfer and regulating commercial technology (Deutch, 2001). Government regulations also insulated firms from international pressures through dual-use production, export controls, and rules against foreign ownership or competition (Hartley, 2007).

Firm behavior is tied to changes in market regulation. The US is an ideal-typical PSS with its massive defense expenditures, but its regulatory behavior independently shapes defense markets. US firms began investing in IR&D over the 20th century, with firm behavior responding to the critical junctures in defense regulatory power, accelerating after 1980s regulatory reforms (author, 2019). Indeed, US defense firms’ IR&D patterns do not correlate with PSS power (defense spending), and indeed even rise during spending downturns. Instead, US firms are assured by US defense regulation to self-fund, because regulation links current firm risk-taking to future profit-making. One example is the 2014 *Better Buying Power* initiative explicitly designed to overcome defense austerity measures by encouraging defense industry IR&D funding (Weisgerber, 2014), which identified “a list of emerging

risks to help the industry make strategic investments” (Hoffman, 2013). *Better Buying Power* provided no immediate material incentives to defense contractors and no guarantee of future sales (Hoffman, 2013). Within a month of the initiative launch, however, US firms responded by increasing IR&D funding, with even smaller contractors investing over 20 percent of their profits, based on signaling of larger, more stable future markets (Fryer-Biggs, 2013).

Firm expectations of future profit are assured by robust regulation of market boundaries and acquisition life-cycles. Firms are willing to reduce current profit for the sake of future profit when they are assured by active regulatory authority linking defense markets—including research, acquisition, and services—over time (Crow 1988). Regulatory governance shifts risk from the private to the public sector, and allows firms to hold stable expectations over time about their relative risk profile within their home defense markets, including expectations of future profit, competitiveness, and stability. Regulatory authority is therefore also a source of defense capacity, independent from material sources such as defense spending and direct procurement. This phenomena is also evident in the EU, where Brussels increasingly uses regulatory power to shape European markets. On a spectrum of PSS-RSS authority, the EU has little traditional political authority to manage the defense acquisition life cycle at the European level, but increasing regulatory power to monitor the content and boundaries of the EU defense market, in that its boundaries shape *who* can participate in European defense markets, and *what defense markets are*. In the next section, I trace these developments, and in the last part of the paper, I show how firms have responded and adapted to EU regulatory authority in defense.

Rule-Making in the EU Defense Sector

In this section, I trace the emergence of EU defense governance. Within the PSS-RSS authority spectrum, the EU has some nascent PSS authority, with a minimal but increasing material authority over defense research spending and capabilities procurement. Incremental developments in EU material defense authority include the 2004 European Defence Agency (EDA), the 2007-2014 FP7 Research Programme, the 2014-2021 Horizon 2020 Programme, and the 2017 EDF and Permanent Structured Cooperation (PESCO). The EDA was founded to better coordinate member state defense capabilities, and created modest pilot procurement projects over key capability gaps (Macchiarini Crosson, 2021). The Commission has also funded over €2B in dual-use (military and civilian) security research since 2004, via the ‘Preparatory Action on Security Research’ (EC, 2004), the Sixth (FP6) (EC, 2007) and Seventh Framework Research Programmes (FP7) (EC, 2011), and the Horizon 2020 programme (EC, 2011). 2017 marked a leap in EU PSS authority, with the EDF (2021-2027) (EEAS, 2018), PESCO, the Multiannual Financial Framework (MFF), the European Defence Industrial Development Programme, and the European Peace Fund (EPF) (€5 billion) (Council of the EU, 2018).

While the EU has some nascent PSS elements, it does not control the strategy and budgets of its sovereign member states. The EU has become, however, a significant regulator of security and defense markets. EU efforts to regulate national defense markets accelerated in the mid-2000s, resulting in the 2004 EDA, 2009 Lisbon Treaty, and 2017 PESCO and EDF. The latter formalized the authority of the European Commission (EC) over brokering and regulating EU strategic capability projects. There are two mechanisms through which the EU regulates: via positive and

negative integration (Sharpf, 1998). Whereas negative integration breaks down and de-regulates existing national market boundaries, positive integration re-creates rules, at a new (continent-wide) level. EU negative defense integration incentivizes cross border industry activity, harmonizes internal market and taxation rules, and redefines industry boundaries. EU positive defense regulation creates new European level-rules, monitors member states defense spending, incentivizes European-level procurement demand, and regulates boundaries around European defense markets, particularly by limiting the participation of third country firms in European projects.

Early EC attempts to regulate defense markets started in the 1990s. A 1995 working group on European Armaments Policy (POLARM) identified “specific measures within the EU’s jurisdiction” (Rutten, 1999) to bypass Article 296 of the 1992 Maastricht Treaty, which enshrined national defense market protectionism and a defense exception from EU Common Market regulation (Schmitt, 2003). A 1996 EC report proposed removing national barriers in defense markets, including: anti-monopoly industry action; harmonizing public-private ownership structures, arms export policies, and national defense equipment requirements; alter the regulatory barriers between civilian and military procurement markets and industries, in particular the “spin-off” of where defense technologies can be used in civilian markets and “spin-in” processes where high tech civilian technologies are available for military purposes (EC, 1996). These measures reflected EC attempts to bypass Art. 296 to govern defense markets (Marrone & Nones, 2020). The Commission eventually found a regulatory opening in the gray area of dual-use technology, allowing the “defence sector [to] participate in the Community programs” (EC, 1996, p. 20). In 1997, the Commission identified dual-use defense markets as “a major means of production and essential to foreign and

security policy. Any action by the EU has to take this dual nature into account, if necessary by adapting the resources within the Community's jurisdiction" (EC, 1997).

The EC's entrepreneurial efforts expanded EU market authority from civilian to dual-use security regulation by the mid-2000s (Edler & James, 2015). The Commission was able to bypass Art. 296 by regulating dual-use and security products produced by the European defense industrial base. Its 2004 Green Paper on defense procurement proposed a common defense export control regime and defense equipment policy (*Aviation Week & Space Technology*, 2003). The EDA launched a "code of conduct" promoting more transparent cross-border defense procurement, and tightened guidelines on special exemptions from EU rules on competitive bidding (EDA, 2020). The Commission's efforts effectively blurred procurement and market boundaries for civilian security and military defense industries and markets (Schilde, 2017).

EU regulatory authority expanded with the creation of the EDA in 2004. The EDA was tasked to coordinate capabilities, create joint investment solutions to capability shortfalls (such as heavy lift equipment and helicopters) towards the goal of EU strategic autonomy, and integrate the European defense industrial base by supporting technology and markets at the boundary of civilian and military applications, including civilian crisis management solutions such as UAVs, WMD defense, and software-defined radio. EDA regulatory authority attempted to break down old rules and build up new requirements, such as the 2017 Coordinated Annual Review on Defence (CARD), giving the EDA authority to review states' defense data to identify areas of joint capability development (EDA, 2020). According to an EDA official, regulatory authority directly shaped defense markets, even with little formal capacity: "The defence industry wants [higher budgets] but that would mean we would just pay them to plan for future [research]. When our budget is just €6

million, [...] companies who want a piece of the pie in the future have to help us with their own resources, and they have to absorb the planning risks for the eventual EU market on their own, which makes them more invested in the long-term project, [with us signaling] what direction to lead the EU's defence technology and investment” (Schilde, 2017).

EU regulatory authority also defines an *external* boundary around the EU defense market by disincentivizing or blocking third parties from participating in EU defense initiatives. The EC proposed as early as 1996 that US defense firm access to European procurement markets should be closed until the US agreed to reciprocal market access for European firms (EC, 1996). The Commission also linked negative integration (harmonization of rules) to positive integration (boundaries around EU defense markets) in a report strategizing that harmonizing defense import duties could also function as non-tariff barriers to trade and have the effect of limiting the imports of US weapons to Europe, necessary because “...the survival of an independent industrial and technological base in Europe is now being put into question. The state of our armament industries is such that if nothing is done, there is a real danger that within five years or so they will fall under technological and financial sway of US masters – or undergo a process of national retrenchment” (Tigner, 1996).

The EDF has further incentivized positive integration in European defense. There are ongoing attempts to create new EU-level policies on key issues such as a common arms export policy (Béraud-Sudreau, 2019). In addition to coordinating EU member state defense capabilities, its regulatory guidance determines who can access EDF funds. Its purpose was to bound member state recipients of funds to “the importance of European preference, [...] fostering true autonomy for the European defense industrial and technological base, [where] the recipients and subcontractors

participating in an action with financial support from the Fund are established in the European Union [...] and are not controlled by a non-associated third State or non-associated third-State entity and, [...] that the infrastructure, installations, goods and resources of those recipients and subcontractors are located on the territory of a Member State [...] as well as their executive management structures” (French Senate, 2020). French officials, in particular, have been actively promoting the criteria of “effective control,” aiming to exclude extra-European companies from being able to take advantage of European funds (Ibid).

The PESCO program launched in 2017 also incentivized positive regulatory integration. PESCO attempts to increase European strategic autonomy and resolving capability gaps by bringing member states together in small joint capability based military projects in land, sea, air, space and cyberspace, ranging from drone defense through maritime surveillance to intelligence training (EEAS, 2018). PESCO was originally written with quite explicit language supporting only EU firms. A major debate has brewed over whether to let “third countries” participate in PESCO, which include the US and non-EU European states such as the UK and Norway (Brzozowski, 2019). Some member states (and a few firms) are eager to have US firms and weapons platforms enhance EU strategic autonomy, with other states (and most firms) concerned about US firm competitiveness and dominance in projects, and whether any EDF funding would support non-EU firms. After US complaints of protectionism and two years of EU-US negotiations, the EU Council determined that—under limited circumstances and with Commission review and oversight—“third parties could exceptionally be invited to participate in individual PESCO projects” (Council, 2020, p. 21). Foreign firms could only join PESCO projects if they have a corporate presence inside the EU, provide “substantial added value” in the form of technical or operational expertise, adhere to “the values on

which the EU is founded,” do not create “dependencies on a third state,” have agreed to a “security of information agreement” and an “administrative arrangement,” and would not keep any intellectual property from the venture (Council, 2020). Additionally, only third-party states, not third party firms, may join PESCO (until 2026 at the earliest). (Sprenger, 2020).

Limited third party PESCO participation will be subject to Commission governance in order to allow European “effective control” over projects, including reviews of corporate strategy, corporate governance, shareholder rights, financial ties, and commercial cooperation with other countries (EP, 2018). This governance of third parties is a robust regulatory authority over EU defense markets, in this case, it provides an external market boundary. The EU is both a negative integration RSS, when it breaks down national and market boundaries, and a positive integration RSS, when it builds new policy, oversight, and monitoring of boundaries around markets.

Rule-Taking in the EU Defense Sector

A test of the EU’s regulatory power as a rule-maker in defense is whether it has an effect on rule-takers. The EU as an RSS should have observable effects on the behavior and preferences of firms within EU markets, otherwise it is just powerlessly regulating into a void. Heuristics from the US case indicate that there is a link between robust market regulation and firm risk perceptions, empirically evident in firm IR&D investments (Demirel and Kesidou, 2019). Robust EU regulatory authority should signal some assurance of EU defense market governance stability over time to firms, particularly on future profits. A comparable regulatory industry to defense is pharmaceuticals, and European pharmaceutical firms (such as Pfizer) responded to EU regulatory measures such as

the Innovative Medicines Initiative with an IR&D increase (Jaruzelski et al, 2015, p. 13). Even in the absence of a common (PSS) EU defense procurement market, both positive and negative regulation should increase firm expectations of recovering early investments in later acquisition sales, via national defense, internal security, or foreign export markets. The EU's market-making and protecting-mechanisms serve to assure EU defense firms of their future competitiveness. The regulatory market power of the EU allows firms to assume greater short term risk (i.e. self-fund their own R&D) because of signaling of the EU as a regulatory force that allows them to manage their risk assessments about the future. The shadow of EU regulatory authority changes firm expectations and risk assessment, even if the levers of authority are merely ideational or regulatory, without a transactional guarantee of material profit.

What firms get out of the EU is not material defense budgets, but market management, even managed protectionism, with effects that can be traced in defense industry risk and firm behavior. Under these conditions, they are more willing to self-fund defense research and development for their home countries. With negative integration, firms get access to civilian security markets on a European scale. With positive integration functions, firms enjoy a governed European defense market that regulates and protects the EU defense industry from direct competition with more competitive foreign firms. Firms are not guaranteed procurement outcomes, but they are more assured of their competitiveness within Europe than globally (Calcara and Simon, 2021). While large firms are supposed to prefer trade openness to protectionism, firms in oligopolistic markets are more likely to prefer home market protectionism, because it is likely to increase profit margins, while still seeking market access abroad (Bombardini & Trebbi, 2012). The next three subsections 1) tie EU regulatory efforts to firm behavior based on an observable shift towards firm IR&D, 2) identify

statements from defense firms and industry associations linking EU regulation to reduced market risk, and 3) explore firm responses to EU regulation within the case of a specific weapons program.

IR&D behavior of European Defense Firms

Defense technology--whether produced by the state or private actors-- is the societal “transformation of ideas and knowledge into new or improved products, processes and services for military and dual-use applications” (Cheung, 2021). Defense research is typically considered a ‘public good,’ associated with higher government than private funding (Goolsbee, 1998). The mid-20th century was the point of greatest state involvement in the public good of both civilian and defense research. Advanced industrial states designed weapons technology in government labs, then involved private (or public-private) firms to manufacture weapons. Arms contractors manufactured weapons for states, but historically did not fund or develop weapons technology on their own. First in the US, then in Europe, contractors have shifted towards developing in-house technology, funded out of their own profits, not from government funds (Neuman, 2010). The practice began in the US after World War II, when postwar fiscal pressures prompted the US military to propose US weapons manufacturers invest their own funds into arms prototypes, and accelerated in the 1990s. US firm IR&D even surpassed government defense research spending during the 1990s spending cuts. The same public-private shift also happened in Europe, only later.

In order to evaluate whether European firms have responded to EU defense rule-making, I collected seventeen years (2002-2018) of annual reported defense firm IR&D investments and European state defense R&D data from the EDA Dashboard, then validated the figures with

intermittent (PWC 2004, 2007, 2012, 2018, 2020) proprietary defense industry reports from PriceWaterhouseCoopers.¹ While the data is incomplete, it suggests a relationship between EU defense regulation and the onset and rise of European defense industrial IR&D. This link is tentative, but further qualitative evidence suggests a firm-level link. IR&D data describe that, before 2003, European defense firms spent little to no firm profits on IR&D, but began self-funding defense technologies between 2004-2007. Between 2007-2012 alone, firm IR&D investments rose more than 30%. This occurred during the most significant downturns in European member state defense spending since the end of the Cold War, when national defense budgets declined in response to the financial and sovereign debt crisis. Indeed, firm IR&D spending increases were occurring during a nadir not just of European defense spending overall, but also of negative real growth in member state procurement budgets and a 50% decline in member state R&D spending between 2006-2012 (Balis and Heidenkamp 2014, p. 5).

The rise in European defense firm IR&D after 2004 is also comparatively notable. By 2012, European firm self-funding surpassed and doubled US defense firm investments (Velocci, 2014). European firms also spent more in 2012 than their own governments on defense R&D budgets (Jaruzelski et al, 2012), by a proportion of 2 to 1 (ASD, 2014). By 2020, European firms spent at least fivefold more of their profit on IR&D than US firms, often canceling out profit margins entirely (PWC, 2020). While this observed shift is not sufficient to conclude that IR&D is linked to EU defense regulation, firms and industry associations have themselves linked the EU regulation

1 In order to create a data set of IR&D firm spending, I calculated the internal R&D investments of the top ten European defense firms for the years 2002-2018 from the European Union Industrial R&D Investment Scoreboard (<https://iri.jrc.ec.europa.eu/scoreboard/>). I did not calculate all firms, so it is an undercount of total industry IR&D investment, but I identified the top ten European defense firms by revenue, present each year in the data, in order to identify the annual investment trends over time. Sampled firms include BAE Systems, Rolls Royce, Safran, Finmeccanica/Leonardo, EADS, Thales, Dassault, Saab, Meggitt, and MTU Aero Engines. I chose the top ten in order to mirror an ongoing comparative study of comparative defense markets. A calculation of firm-level efforts is necessary because existing R&D spending reporting conflates public and private spending, such as that provided by the European Defence Agency Defence Data Portal (<https://eda.europa.eu/publications-and-data/defence-data>). Identifying firm data and then aggregating it on an annual basis isolates and identifies industry patterns, rather than total state and society R&D spending.

and firm risk in their strategy and rhetoric. European firms identify their willingness to invest in IR&D to the creation of a European-level defense regulator that could harmonize defense regulations and monitor the boundaries of a European market.

EU defense firm preferences for EU regulatory governance

Firm preferences have responded to EU defense regulatory authority: indeed, they lobbied for it before it even existed. The seeds of the efforts began in 1988 when European defense firms lost access to US procurement markets (Sparaco, 1994). Firms did not see sustained survival selling primarily to much smaller European home markets (Aviation Week & Space Technology, 1988). These concerns only deepened with the global defense downturn at the end of the Cold War, when the US state—even while it was reducing its demand for weapons—actively regulated its defense industrial base through multiple mechanisms: incentivizing supply-side mergers, removing barriers between military and civilian technology markets, maintaining protectionist barriers to government prime contracting, and restricting technology transfers via International Traffic in Arms Regulation (ITAR) (Schilde, 2017).

In response to US defense market regulation, European firm preferences have evolved to want a larger European market with EU regulations. According to EADS CEO Tom Enders: “I am not arguing for a budget increase; and certainly not at a time when most countries in Europe are having to cut back their public spending significantly. The task at hand is much more to do with reprioritising the allocation of scarce budgets [with EU regulation]” (Guardian, 2012). European-level industry groups have supported EU regulation to insulate firms from global

competition, incentivize technology transfer and dual-use (Guay, 2005), break up national monopolies, and break down boundaries between security and defense markets (Taylor & Schmidt, 1997). Firms realized that they could benefit from EU negative integration via access to civilian markets by eliminating the “fragmented and uncoordinated” “incomplete internal market” between civil- and defense-related applications, allowing traditional defense firms to operate within both markets, with larger economies of scale and spillover technology (EC, 2002). EU regulation could also eliminate “incompatible national requirements,” and “secure a level playing field” (Ibid, p. 72).

Industry preferences for European defense regulation also favor a ‘positive’ single set of EU rules and an external boundary. The first EDA Director agreed that, “[j]ust like US firms, EU firms] need [regulation] on a Continental scale to be profitable” (Witney, 2008). Firms have lobbied for “a coordinated research strategy, [...] tax incentives, [...] a coherent EU security and defence [regulatory] structure” (EC, 2002), personnel reforms such as engineer mobility and technology transfer rules (EUISS, 2007, p. 22), and a centralized research support agency such as US’ DARPA (Barrie and Taverna, 2002). Firm preferences also included the EU regulating a “preference europeenne” in the armaments acquisitions of national member states, with a European arms market more closed off from international competition, particularly from US firms. Serge Dassault linked this to strategic autonomy, arguing that: “a Europe dependent on arms imports from America, would be a Europe dependent on America’s foreign policy” (The Economist, 1995).

Firms have tied their preferences for EU regulation to their willingness to take on enterprise risk. EU regulatory authority “insulate[s] [firms] from risk and uncertainty” (EUISS, 2007, p.22), because it makes national defense procurement markets more regulated and predictable, and stimulates national demand for long-term defense contracts. Even when member state defense

spending increases, firms still wanted a regulator to “signa[l] and addres[s] the risks involved in forecasting and directing long-term investment strategies (Schilde, 2017, p. 241). In response, firms would engage in higher investment, due to having a single source of information and ability to hedge risks accordingly (EC, 2002) over planning future research and development, and a reduced reliance on commercial business cycles (*Aviation Week & Space Technology*, 1988). As the BAE CEO stated in a earnings call to investors: regulation hubs like the US DARPA or the EU allow us to “invest more in self-funded R&D, [and] operate with negative working capital,” because then “our [future] contracts tend to be positively funded [with] operating leverage and better asset utilization in the future to further enhance our return on invested capital.” (BAE 2021, p. 20)

THE EU RSS and the Eurodrone

The Eurodrone is “the beginning of European defense[:] member states have finally decided to rely on European industry [...] an important step towards independence,” to “wean Europe off its reliance on US and Israeli UAVs” (Kingdon, 2021) because “sovereignty has a cost, not at any price, but we accept this” (AFP, 2020).”

The Eurodrone program helps illustrate the mechanisms of the interactions between EU regulation and defense firms. While the EU initiated the program with modest EU-level funds (acting as a PSS), the project has developed via EU regulation that incentivizes private sector action by reducing firm investment risk over long procurement times. The Eurodrone is a medium-altitude, long-endurance (MALE) remotely piloted aircraft system (RPAS) developed by Airbus, Dassault Aviation and Leonardo for use by France, Germany, Italy and Spain (OCCAR, 2021). It is a PESCO

and EDF project managed by OCCAR (Organisation for Joint Armament Co-operation) “based on nearly 100% European technologies” (Flaherty 2021), in order to bypass US arms export rules (AFP, 2020). With a total cost of €7.1 billion, each drone is €40m cheaper than the US Reaper. The Eurodrone is partially a EU PSS outcome, because the EDF provided €100 million in initial direct funding. However, the Eurodrone is also a product of EU RSS authority, including common industry requirements, regulation of civilian airspace, Galileo satellite technology, and the organizational expertise of the EDA. Airbus officials identified a previous lack of industry cooperation due to “no common requirement,” which led “many countries [to instead use] the Predator” (Kington, 2018). The Eurodrone is also intended to be used for civilian as well as military functions, and therefore is integrated into EU civilian air traffic standards. Civilian integration helps firm expectations of additional sources of future profit. It will also be built on the EU Galileo navigation system, to “wean Europe off its dependence on the U.S. GPS system” (Kington, 2018). Finally, it will be tested by the EDA’s “networked procedural trainers” such as hardware simulators for interoperability and training, in partnership with the European Air Group (EAG) and the EU Military Staff (EUMS) (Airforce Technology, 2020).

Firms have responded to the Eurodrone with “revolutionized R&D activities” and “accelerated innovation” because it “signals broad opportunities [that] increase [firm] confidence” (SESAR, 2016). During the 2018 Eurodrone announcement, Airbus executives touted it as the “first milestone of what Europe can achieve in a high-technology sector [... that will] guarante[e] Europe’s sovereignty in the future [that] eases the countries’ constrained budgetary situation through clever pooling of research and development funds” (Airbus, 2018, p 1). Prior to 2018, it did not reference EU strategic autonomy in its corporate documents. After 2019, corporate documents claim the

ability to “shape and deliver European power ambitions by providing military platforms, space assets, associated services, as well as missiles and launchers through its participation” (Airbus 2019, p. 127).

Airbus has linked EU governance to it being “prepared to take modest or low event risks to provide sufficient predictability on profitability and cash flow given the necessity to stay competitive, invest in R&D and manage the diversified portfolio of business in a world of uncertain market and economic conditions” (Airbus, 2019, p. 53). EU-level Eurodrone involvement also allowed for “a reduction of risk exposures” which would allow the firm to “ramp up our R&D next year (in 2022)” (Seeking Alpha, 2021) in “flight physics methods and tools, energy and thermal management developments [and] cloud-based networking (Airbus, 2021 p. 93). Airbus identified EU RSS efforts as “provid[ing] new sales opportunities through European Union members’ collaborative procurement mechanisms” (Airbus, 2020, p. 45) as well as “services verticals [...] prospects as the market evolves [with opportunities in] Europe, the US and Asia Pacific [...] among Armed Forces and other Homeland Security agencies alike” (Ibid, p. 48). Airbus also touted European protectionism via negative regulation when officials stressed to shareholders that the Eurodrone would be the only UAV certified by the EU to fly in unsegregated (civil and military) European airspace (Airbus, 2020).

Conclusion

Defense governance is a spectrum of traditional material and regulatory authority. Defense capacity arises from both regulation and traditional material capacity. Traditional states such as the

US also govern their markets through regulatory authority, and market powers such as the EU have a small amount of traditional material authority. However, key developments in EU defense market governance are driven by its increasing regulatory power. The power of the regulatory state is real, but in Europe that power is coming from the EU, not member states, due to its size and regulatory mechanisms.

European states are trying to develop strategic autonomy. The goals of their defense industries have been profit and survival. When defense firms invest in technology, they do so because they expect to eventually regain their profit with their primary state customer. European firms have increased their IR&D since the creation of an EU RSS, and they have themselves linked this activity to a decreased risk perception from increasing future sales to European member states, brokered and enabled by EU regulatory activity. What firms get out of the EU is not material defense budgets, but market management and managed protectionism, with effects that can be traced in defense industry risk and firm behavior. By investing in technology for European strategic autonomy, firms have risked their revenue in the short term with the perceived assurance of long term gains, because the regulatory power of the EU has enabled and governed a market that could be big enough for sustained profits, but regulated enough to be protected from outside competition.

Bibliography

Aerospace and Defence Industries Association (2014) “Aerospace and Defence Industries Facts and Figures 2014”, *ASD*, 2014. Available at:

<https://www.asd-europe.org/sites/default/files/atoms/files/ASD%202014%20Facts%20and%20Figures.pdf>

AFP (2020) “France Sees Joint European Drone Project Launched ‘This Year’”, *Agence France Press*, September 16, 2020.

Airbus (2018) “Airbus, Dassault Aviation and Leonardo reaffirm their total commitment in the first fully European MALE programme.” *Airbus*, April 26th, 2018. Available at: <https://www.airbus.com/en/newsroom/press-releases/2018-04-airbus-dassault-aviation-and-leonardo-reaffirm-their-total>

Airbus (2019) “2019 Report of the Board of Directors”, *Airbus*, Issued as of 12 February 2020. Available at: <https://www.airbus.com/sites/g/files/jlcbta136/files/2021-07/Report-of-the-Board-of-Directors-Airbus-SE-2019.pdf>

Airbus (2020) “2020 Report of the Board of Directors”, *Airbus*, Issued as of 17 February 2021. Available at: <https://www.airbus.com/sites/g/files/jlcbta136/files/2021-10/Full%20Report-Airbus-SE-Annual-Report-2020.pdf>

Airbus (2021) “2020 Report of the Board of Directors - Building a sustainable future”, *Airbus*, Available at: <https://www.airbus.com/sites/g/files/jlcbta136/files/2021-06/AirbusSE-Board-Report-2020.pdf>

Airforce Technology (2020) “European MALE RPAS, Europe”, *Airforce Technology*, December 7th, 2020. Available at:

<https://www.airforce-technology.com/projects/european-male-rpas-europe/>

Author (2019) "Governed Interdependence in a Developmental Network State: The US Defense Industrial Base" Working Paper in review.

Aviation Week & Space Technology (1988) ‘European Nations Attempt to Create Single, Competitive Arms Market, Unifying Europe’s Markets’ 130 (24).

Aviation Week & Space Technology (2003) ‘The European Commission’, 17.03.2003, 16.

BAE Systems PLC (OTCPK:BAESF) Q4 2020 Earnings Conference Call (2021), February 25, 2021 4:00 Available at: <https://seekingalpha.com/author/sa-transcripts>

Balis, C., & Heidenkamp, H. (2014) ‘Prospects for the European Defence Industrial Base’, *RUSI Occasional Papers*, Royal United Services Institute, Occasional Paper, September 2014.

Barrie, D. and Taverna, M. “EADS advocating EU DARPA”, *Aviation Week & Space Technology* November 25, 2002, Vol. 157, No. 22; p. 32

L. Béraud-Sudreau, “Building Franco-German Consensus on Arms Exports”, *Survival: Global Politics and Strategy*, Vol. 61, No. 4, 2019, pp. 79-98.

Bialos, J. P. and Fisher, C. E., and Koehl, S. L. and Mossberg, C. L. and Gasparini, G., & James, A. D. (2009) *Fortresses and Icebergs: The Evolution of the Transatlantic Defense Market and the*

Implications for US National Security Policy. Volume 2: Country Studies. John Hopkins University, Washing D.C. School of Advanced International Studies.

Bombardini, M. and Trebbi, F. (2012) ‘Competition and political organization: Together or alone in lobbying for trade policy?’ In: *Journal of International Economics*. 87 (1), pp. 18–26, DOI: 10.1016/j.jinteco.2011.11.011.

Bönte, W. (2003) ‘R&D and productivity: Internal vs. external R&D - evidence from West German manufacturing industries’ In: *Economics of Innovation and New Technology*. 12 (4), pp. 343–360, DOI: 10.1080/10438590290018415.

Brzozowski, A. (2019) ‘Question marks over third country participation in EU military projects’ *Euractiv*, 09.11.2019 Available at: <https://www.euractiv.com/section/global-europe/news/question-marks-over-third-country-participation-in-eu-military-projects/>

Calcara, A. and Simón, L., 2021. Market Size and the Political Economy of European Defense. *Security Studies*, 30(5), pp.860-892.

Cheung, T.M., 2021. A conceptual framework of defence innovation. *Journal of Strategic Studies*, pp.1-27.

Council of the EU (2018) 2018/0254 (COD) Proposal for a regulation establishing the European Defence Fund (First reading) - Partial general approach, the European Parliament

and the Council, November 2018. Available at:
<https://data.consilium.europa.eu/doc/document/ST-14094-2018-REV-1/en/pdf>

Council of the EU (2020) 2020/1693 ‘COUNCIL DECISION establishing the general conditions under which third States could exceptionally be invited to participate in individual PESCO projects’, Brussels, 27 October 2020. Available at:
https://pesco.europa.eu/wp-content/uploads/2020/11/ST_15529_2018_INIT_en.pdf

Crow, M.M., 1988. Assessing government influence on industrial R&D. *Research-Technology Management*, 31(5), pp.47-52.

CSIS (2012) ‘*Internal R&D Productivity in Aerospace and Defense*’ (rep.) Center for Strategic and International Studies (CSIS), 1/27/12.

Demirel, P. and Kesidou, E., (2019) “Sustainability-oriented capabilities for eco-innovation: Meeting the regulatory, technology, and market demands. Business Strategy and the Environment”, *Business Strategy and the Environment*, 28(5), pp.847-857.

Deutch, J. M. (2001) ‘Consolidation of the U.S. Defense Industrial Base.’ *Acquisition Review Quarterly*, 13.

Dowdy, J. (1997) ‘Winners and losers in the arms industry downturn’. In: *Foreign Policy*. (107), pp. 88–103, DOI: 10.2307/1149335.

Edler, J. and James, A.D. (2015) ‘Understanding the emergence of New Science and Technology Policies: Policy entrepreneurship, agenda setting and the development of the

European Framework Programme' In: *Research Policy*. 44 (6), pp. 1252–1265, DOI: 10.1016/j.respol.2014.12.008.

EC (1996) 'The Challenges Facing the European Defence-Related Industry, A Contribution for Action at European Level' European Commission COM (1996) 10 final. Brussels, Belgium.

EC (1997) 'Implementing European Union Strategy on Defence-Related Industries' European Commission COM (97) 583 final. Brussels, Belgium.

EC (2002), "Strategic aerospace review for the 21st Century," European Commission, Enterprise Publications, July 2002. Available from http://ruestungsexport-info.de/fileadmin/media/Dokumente/Hintergrundinformationen/EU_Doks/EU-Kommission-Bericht-STAR-21-2002.pdf

EC (2004) "Communication on the implementation of the Preparatory Action on the enhancement of the European industrial potential in the field of Security research, towards a programme to advance European security through Research and Technology", European Commission COM(2004) 72 final, Brussels, Belgium.

EC (2007) "The European Security Research and Innovation Forum(ESRIF) - Public-Private Dialogue in Security Research", European Commission MEMO/07/346, Brussels, Belgium.

EC (2011) “Investing into Security Research for the Benefits of European Citizen”, Enterprise and Industry, Security research Projects under the 7th Framework Programme for Research’ European Commission

<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52011DC0808&from=EN>

EDA (2012) ‘Code of Conduct on Pooling and Sharing, European Defence Agency’ Brussels.

EEAS (2018) ‘Defending Europe : European defence fund - factsheet’ *European External Action Service (EEAS)*. Retrieved from https://eeas.europa.eu/headquarters/headquarters-homepage/35203/defending-europe-european-defence-fund-factsheet_en%20.

EEAS (2021) ‘Permanent Structured Cooperation (PESCO) - factsheet’ *European External Action Service (EEAS)*. Retrieved from https://eeas.europa.eu/headquarters/headquarters-homepage/34226/permanent-structured-cooperation-pesco-factsheet_en

EDA (2020), “COORDINATED ANNUAL REVIEW ON DEFENCE (CARD)”, European Defence Agency. Available at: [https://eda.europa.eu/what-we-do/EU-defence-initiatives/coordinated-annual-review-on-defence-\(card\)](https://eda.europa.eu/what-we-do/EU-defence-initiatives/coordinated-annual-review-on-defence-(card))

EUISS (2007) 'ESDP Newsletter: European Security and Defense Policy Issue #5 'Africa-EU,' European Union Institute for Security Studies, Brussels: General Secretariat of the Council of the European Union, December 2007.

EP (2018) "Report on the proposal for a regulation of the European Parliament and of the Council establishing the European Defence Industrial Development Programme aiming at supporting the competitiveness and innovative capacity of the EU defence industry", European Commission 2017/0125(COD), Brussels, Belgium. Available at: https://www.europarl.europa.eu/doceo/document/A-8-2018-0037_EN.html

Flaherty, N. (2021) "Eurodrone and SDR project see €137m", eeNews Europe - Business news, June 30, 2021. Available at: <https://www.eenewseurope.com/en/eurodrone-and-sdr-project-see-e137m/>

Franck, R.; Melese, F. (2008) 'Defense acquisition: New Insights from Transaction Cost Economics' *Taylor & Francis*. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/14751790802124931>.

French Senate (2020) Résolution européenne sur le Fonds européen de Défense, 17 février 2020, <https://www.senat.fr/leg/tas19-061.html>

Fryer-Biggs, Z (2013) 'US Private Firms Boost Internal R&D Spending' *Defense News*. 13.11.2013.

Gholz, E. (2000) 'The Curtiss-Wright Corporation and Cold War–ERA Defense Procurement: A Challenge to military-industrial complex theory' In: *Journal of Cold War Studies*. 2 (1), pp. 35–75, DOI: 10.1162/15203970051032372.

Goolsbee, A. (1998) 'Does government R&D policy mainly benefit scientists and engineers?' In: *American Economic Review, AEA Papers and Proceedings* . 88 (2), pp. 298–302, DOI: 10.3386/w6532.

The Guardian (2012) 'If the EU cuts funding to technology, Europe risks being left behind', 27 November. Available at: <https://www.theguardian.com/business/2012/nov/27/eu-funding-future-technologies-europe>

Guay, T (2005) *The Transatlantic Defence Industrial Base: Restructuring Scenarios and their Implications*. Carlisle, PA: Strategic Studies Institute.

Hartley, K. (2007) 'Chapter 33 the arms industry, procurement and industrial policies'. In: *Handbook of Defense Economics*, pp. 1139–1176, DOI: 10.1016/s1574-0013(06)02033-3.

Hoffman, M.-L. (2013) 'Frank Kendall: Defense firms should sustain internal R&D programs' *Executive Gov.* Retrieved am from <https://executivegov.com/2013/08/frank-kendall-defense-firms-should-sustain-internal-rd-programs/>.

Jaruzelski, B. Locher, J. and Holman, R. 2012. The 2012 Global Innovation 1000 Study: Making Ideas Work. Booz & Company.

<http://www.booz.com/global/home/what-we-think/global-innovation-1000>

Jaruzelski, B. Schwartz, K, and Staack, V. 2015. Innovation's New World Order. PriceWaterhouseCoopers, THE GLOBAL INNOVATION 1000 ISSUE 81 WINTER 2015

Kington, T., (2018) "New Eurodrone will rely on Galileo satellite navigation, but have GPS just in case", C4ISRNET, May 11, 2018. Available at:

<https://www.c4isrnet.com/unmanned/2018/05/11/new-eurodrone-will-rely-on-galileo-satellite-navigation-but-have-gps-just-in-case>

Kington, T., (2021) "Eurodrone effort gets \$118M funding boost, updated production timeline", C4ISRNET, May 11, 2018. Available at:

<https://www.c4isrnet.com/unmanned/2018/05/11/new-eurodrone-will-rely-on-galileo-satellite-navigation-but-have-gps-just-in-case>

Locher, J. R. (2004) *Victory on the Potomac the goldwater-nichols act unifies the Pentagon*. College Station: Texas A & M University Press.

Macchiarini Crosson, D (2021) 'EU DEFENCE PROJECTS Balancing Member States, money and management' In: *CEPS policy briefs*. 2. Available at:

https://www.ceps.eu/wp-content/uploads/2021/12/PB2021-02_EU-defence-projects.pdf

Mandelbaum, M. and Lindblom, C. (1978) 'Politics and markets: The World's political-economic systems.' *Political Science Quarterly*. 93 (3), p. 507, DOI: 10.2307/2149546.

Marrone, A. and Nones, M. (2020) 'The EU Defence Market Directives: Genesis, Implementation and Way Ahead' *Documenti LAI*, Istituto Affari Internazionali, 18.09.2020

Martí Sempere, C. (2017) 'A survey of performance issues in defence innovation.' *Defence and Peace Economics*, 28(3), pp. 319-343.

Mazzucato, M. (2016) 'From Market Fixing to Market-Creating: A New Framework for Innovation Policy' *Industry and Innovation*, 23(2), pp. 140–156.

Neuman, S.G., 2010. 'Power, influence, and hierarchy: defense industries in a unipolar world' *Defence and Peace Economics*, 21(1), pp.105-134.

OCCAR (2021) "OCCAR AND MALE RPAS PARTNERS SIGN GRANT AGREEMENT ON THE DEVELOPMENT OF THE EURODRONE", Organisation Conjointe de Coopération en matière d'Armement / Organisation for Joint Armament Co-operation, July 15, 2021. Available at: <https://www.occar.int/occar-and-male-rpas-partners-sign-grant-agreement-development-euro-drone>

PriceWaterhouseCoopers (PwC) (2020) 'Defence trends 2020: Investing in a digital future - PwC' www.pwc.com/defence-trends-2020.

Rogerson, W. P. (1989) 'Profit regulation of defense contractors and prizes for Innovation' *Journal of Political Economy*.97 (6), pp. 1284–1305, DOI: 10.1086/261654.

Rutten, M (rapporteur) (1999) 'Future Cooperation among European Defence Industries in the Light of European Multinational Forces' *CEPS Working Party Report n. 24*, Brussels, June. 1999.

Sandler, T.; Hartley, K. (1995) *The Economics of Defense*. Cambridge England: Cambridge University Press, p. 194.

SESAR (2016) "European Drones Outlook Study Unlocking the value for Europe", SESAR, November 2016. Available at: https://www.sesarju.eu/sites/default/files/documents/reports/European_Drones_Outlook_Study_2016.pdf

Scharpf, F. (1998) *Negative and positive integration in the political economy of European Welfare States*. London: Palgrave Macmillan. pp. 157-177

Schilde, K. (2017) *The Political Economy of European Security*. Cambridge: Cambridge University Press.

Schmitt, B. (2003) *The European Union and armaments getting a bigger bang for the euro*. Paris: Inst. for Security Studies.

Seeking Alpha (2021) "Airbus SE (EADSF) CEO Guillaume Faury on Q3 2021 Results - Earnings Call Transcript", Seeking Alpha Transcripts, October 28, 2021. Available at:

<https://seekingalpha.com/amp/article/4463250-airbus-se-cadsf-ceo-guillaume-faury-on-q3-2021-results-earnings-call-transcript>

Smit, W. A., Elzen, B., & Enserink, B. (1998) 'Coordination in Military Socio-technical Networks: Military needs, requirements and Guiding Principles' In: Disco C., Meulen van der BJR (editors). *Getting New Technologies Together: Studies in Making Sociotechnical Order*, (Vol. 82). Walter de Gruyter, 71-105.

Sparaco, P. (1994) 'Europeans Advocate Unified Defence Market' In: *Aviation Week & Space Technology*. 54.

Sprenger, S. (2020) 'European Union erects legal hoops for outsiders to join defense programs' *Defense News*. 11.2020.

Stuart, Douglas T. (2012) *Creating the National Security State: A history of the law that transformed America*. Princeton: Princeton University Pres.

Taylor, P; Schmidt, P. (1997) 'The Role of the Armaments Industry in Supporting the Preparation and Conduct of Military Operations' *Ebenhausen: Stiftung Wissenschaft und Politik*. 3.1997.

The Economist (1995) 'Markets and Maginot lines.' *The Economist (U.S. Edition)*. 28.10.1995.

Tigner, B. (1996) 'EU Official's Fear US Threat to Aerospace, Defence Base' *Defence News*. 11.11.1996.

Velocci, A. (2014) 'Top-Performing Companies Study Sees Rocky Horizon' *Aviation Week & Space Technology* May 05, 2014 , p. 48

Weisgerber, M. (2014) 'Hagel's right-hand man on acquisition reform' *Defense One*. Defense One Retrieved am from <http://www.defenseone.com/management/2014/09/hagels-right-hand-man-acquisition-reform/95048/>.

Weiss, L. (2014) *America Inc.?: Innovation and enterprise in the National Security State*. Ithaca: Cornell University Press.

Witney, N. (2008) 'Re-energising Europe's security and defence policy', *Policy Paper, European Council on Foreign Relations*, London, July 2008. Available at www.ecfr.eu.