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**DEFENCE INNOVATION: NEW MODELS AND
PROCUREMENT IMPLICATIONS**

The Italian Case

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Policy Paper

ABSTRACT

In Italy, defence innovation takes place mainly within major procurement programmes in the aerospace, naval and land sectors. This links technological innovation to specific capabilities, as well as with the needs of the single military services. Conversely, the funds of the Ministry of Defence (MoD) which are formally dedicated to basic research are extremely limited. The latest defence White Paper (2015) envisaged significant reforms partly to improve defence innovation and procurement, but they have not been implemented yet. In 2020, the Chief of Defence's Strategic Concept outlined an ambitious vision for technological innovation centred on digital technologies and on a wider opening to both SMEs and the broader civilian industry. Such vision would require stable investments in the mid-to-long term, which the current Defence Minister Lorenzo Guerini aims to establish by going beyond the yearly defence budget allocation. However, it has yet to be seen if, how, and when these politico-military intentions will translate to policy. Meanwhile, Italian defence innovation and procurement are going to be increasingly influenced by the European Defence Fund (EDF). Indeed, the EDF provides Italian companies with the opportunity to access a robust budget on specific research agendas and triggers the creation of a European consortium able to move from research and development to the procurement phase. As such, it is deemed very important by both the defence industry and the armed forces which are likely to adjust and align their respective research agendas to exploit EU opportunities.

Keywords: *Italy, procurement, Ministry of Defence, Chief of Defence, joint, defence industry, European Defence Fund*

INTRODUCTION

In Italy, the situation of innovation policy in the defence sector is rather peculiar, mixed and static. Not only have defence budgets basically remained flat over the past decade, but dedicated funds for Research & Technology (R&T) activities have also been slashed. There is a political reason behind these cuts: both personnel costs and investments in procurement programmes are more difficult to reduce than R&T since they generate strong resistance among significant constituencies. In order to circumvent this problem, dedicated R&T budgets have been included in major procurement programmes in the air, naval and land domains, by linking them to the development of specific technologies or prototypes. This has been the cases for Eurofighter and NH90, and more recently for the maritime patrol vessels Pattugliatori Polivalenti d'Altura (PPA) and the modernization of the Italian Main Battle Tank Ariete.

A FRAGMENTED, APPLIED RESEARCH

The way the Italian defence establishment has managed technological innovation so far has a set of implications. First, the focus is on applied rather than basic research, usually involving an elevated Technology Readiness Level (TRL). Secondly, innovation is fragmented across procurement programmes, thus preventing both cross-fertilization and economies of scale. Thirdly, programmes are mainly attached to one service, as a result the joint level inevitably receives less attention and resources, to the detriment of critical areas such as missile defence and the whole cyber domain including the digitalisation of military equipment. Last but not least, the world of defence in Italy is relatively globally closed to Small and Medium Enterprises (SMEs), start-ups and mid-caps companies operating in the civilian sector. Overall, because of this complex system where not all incentives and priorities are aligned, a long-term, comprehensive strategy for defence innovation is very difficult to achieve and, eventually, to implement.

The R&T funds not linked to a specific procurement are managed through the Piano Nazionale di Ricerca Militare (PNRM). The PNRM is the Ministry of Defence's national plan for military research: its budget is extremely limited, about € 50 million per year, and it covers a relatively high number of projects.

An additional factor complicates defence innovation in Italy: defence investments are split between the MoD and the Ministry of Economic Development, with the former allocating around € 2-2.5 billion per year to defence procurement involving Italian industries. Such a funding does include R&T activities, but its exact extent is unclear given that such activities are included in various forms within single procurement programmes. The two ministries have to cooperate both at the political and practical level to finance projects satisfying the needs of the armed forces, and this entails a set of bureaucratic hurdles.

GOOD PRACTICES AND ATTEMPTED REFORMS

Against this backdrop, a positive exception is represented by the space sector. Thanks to the initiative of then military advisor of the Italian Prime Minister, Gen. Carlo Magrassi, a so-called *cabina di regia* – that is a sort coordination board – has been established by law within the executive¹. This *cabina di regia* brings together representatives from the MoD, the Ministry of Economic Development, the Ministry of Education University and Research, the Italian Space Agency, as well as representatives from Italian regional governments and from the private sector. This institutional solution proved its effectiveness as, among other things, it ensured more coherent, stable, and robust investment in this high-tech sector and managed to steer the Italian space policy.

Broadly speaking, over the past decade several governments have worked on defence procurement and innovation policy reforms. However, the conceptual products of such initiatives have not been implemented yet. The 2015 White Book for International Security and Defence presented by then Minister Roberta Pinotti is the most visible example. This White Paper envisaged a promising conceptual distinction between “sovereign” and “collaborative” technologies². The first category brought adequate investments in order to maintain in Italy the full ability to master them. The second one included those technologies where Italian investments had to be pooled with those of European partners in order to pursue interdependence and economies of scale. In the same vein, in 2015 the MoD launched a dialogue with the private sector to build a “matrix

¹https://www.ansa.it/canale_scienza_tecnica/notizie/spazio_astronomia/2018/09/17/verso-una-nuova-regia-per-lo-spazio-italiano_7222bc9b-3922-4547-be49-56b90c18403e.html

² https://www.difesa.it/Primo_Piano/Documents/2015/07_Luglio/White%20book.pdf

of enabling technologies” aimed to identify priority research areas³. However, as mentioned before, no meaningful result has been witnessed so far because of a lack of implementation.

THE 2020 STRATEGIC CONCEPT OF THE CHIEF OF DEFENCE

Several actors within the Italian defence ecosystem – institutions and agencies, industries including prime contractors and SMEs, academia and think tanks – recognize the need to reform the innovation policy. The general desire is to move towards a more strategic, structured long-term approach aiming at prioritizing technological areas and allocating investments in a more efficient and effective way. The 2020 Strategic Concept adopted by Chief of Defence Gen. Enzo Vecciarelli provides important guidelines in this regard. It places great emphasis on technological innovation, with a focus on the digitalization of the force’s structure⁴. It relaunches the “system of systems” approach and stresses the importance of connectivity among platforms in terms of information superiority as well as command and control. This in turn leads to the need to technologically upgrade some legacy capabilities currently lagging behind compared to others. Accordingly, the Strategic Concept welcomes not only large companies and SMEs in the defence sectors, but also other industrial actors to explore new opportunities to cooperate with the Italian armed forces⁵.

In line with this approach, the Strategic Concept explicitly identifies as most promising the space and cyber domains along with the following technologies: tactical clouds, command and control enablers, joint intelligence surveillance reconnaissance, big data, edge quantum computing, digital collaboration, artificial intelligence, mixed reality, and robotics⁶. Implicitly, those technologies have to be synergic not only with the existing equipment, but also with the current processes and organizational structures: in other words, the whole Italian military has to become more digital, interconnected and high-tech. In this context, the range of unmanned platforms is obviously important for all the

³MinisterodellaDifesa, “Creato il sito internet della matrice delle tecnologieabilitanti”, *Informazione e comunicazione*, SGD-DNA, 2 settembre 2015.

⁴https://www.difesa.it/SMD/CaSMD/concetto_strategico_casmd/Pagine/6_1_5_innovazione_competitivita_tecnologica.aspx

⁵https://www.difesa.it/SMD/CaSMD/concetto_strategico_casmd/Pagine/6_1_5_innovazione_competitivita_tecnologica.aspx

⁶https://www.difesa.it/SMD/CaSMD/concetto_strategico_casmd/Pagine/6_1_5_innovazione_competitivita_tecnologica.aspx

armed forces. At the same time, Italian DTIB strengths lie in sensors, radars, avionics, electronic warfare, space systems, platforms such as trainer aircrafts, helicopters, light armoured vehicles, and a broad range of corvettes and frigates: all these elements are likely to find their way in the ongoing and future MoD procurement programmes. As a result, the Strategic Concept's ambitious vision will probably add to the current trends of defence investments rather than replace them.

THE QUEST FOR BUDGETARY STABILITY

Because of the Italian institutional system, defence procurement and innovation policy reforms require strong top-down political pressure, which is also needed to provide, in a second stage, the necessary funding. The guidelines presented by Minister Guerini to the Parliament on 30 October 2019 call for maintaining the country's military technological edge by investing in digital technologies⁷. For this purpose, the guidelines underline that stable, multiannual defence investment commitments support not only an adequate capability development but also innovation within the national Defence Technological Industrial Base (DTIB)⁸ and its competitiveness.

Guerini's approach highlights a certain continuity with the reforms designed by Pinotti's White Paper. This is not surprising since they both belong to the Democratic Party⁹ and have partly relied on the same advisors. However, while Pinotti's White Paper was adopted by a rather homogeneous executive led by Matteo Renzi, the current government headed by Giuseppe Conte is supported by a more heterogeneous coalition which, in light of the parliamentary nature of the Italian institutional system, is more prone to instability. This has important implications for defence: political capital to plan and implement robust reforms is scarce. This explains why initiatives by some lawmakers, such as the one to create an "Italian DARPA"¹⁰, are unlikely to generate much thrust. Realistically, the policy process will thus focus, more pragmatically, on few concrete adjustments which can be delivered in the next semesters.

⁷https://www.difesa.it/Content/Documents/Linee%20programmatiche%20del%20Ministro%20della%20Difesa_On.%20Guerini_intervento%20effettivamente%20pronunciato.pdf, p. 7

⁸https://www.difesa.it/Content/Documents/Linee%20programmatiche%20del%20Ministro%20della%20Difesa_On.%20Guerini_intervento%20effettivamente%20pronunciato.pdf, p. 15

⁹ interestingly, Roberta Pinotti is currently the Chairperson of the Italian Senate's Defence Committee.

¹⁰ <https://formiche.net/2020/01/darpa-italiana-difesa-legge/>

In the meantime, it is noteworthy that important bottom-up initiatives are also underway. In the recent years, the MoD's in-house college and research centre, the Centro Alti Studi per la Difesa (CASD), has increasingly focused on the linkages between technological innovation, military doctrine and defence policy. Similarly, the MoD's Defence Innovation Centre (Centro Innovazione Difesa - CID) has launched a Defence Innovation Hub to favour a dialogue with universities and research centres, and eventually enable their talent to contribute to the world of defence.

THE POSITIVE ROLE OF THE EDF

Against this backdrop, the EU can play a positive role, through the European Defence Fund (EDF), for innovation within the Italian defence. Previous multinational procurement programmes with European (and transatlantic) partners proved to be extremely important in this respect, because they pushed the national DTIB to work on demanding requirements, permitted them to create connections with top-level companies and SMEs in Europe, but also ultimately shielded MoD investments from budgetary cuts¹¹. Building on that basis, Italian stakeholders attributed high importance to the Preparatory Action on Defence Research (PADR) and the European Defence Industrial Development Programme (EDIDP), as well as to the Permanent Structured Cooperation (PeSCo), for a variety of reasons¹². As a matter of fact, the Italian DTIB made a significant investment in terms of human resources, funds, and networking activities in the EU calls. The Italian MoD, including both the Chief of Defence Staff and the National Armament Directorate, appreciated the benefits and potentials of EU defence initiatives, and committed as much as possible to PeSCo, PADR and EDIDP projects. To take just one example, the PADR flagship project is performed by a 42-entities consortium led by Leonardo and includes the Italian Navy¹³. The fact EDF financial envelope has been reduced from 13 to 7 billion euro has generated concerns in Italy. Yet Italian stakeholders still consider the Fund as a positive and important initiative.

We can thus safely speculate that the research agenda set by EDF precursors and then by the Fund in the 2021-2027 is going to be a central point of reference for the Italian

¹¹This has been the case, among others, of the Eurofighter, NH90, FREEMM, EUROMALE.

¹²See in this regard: <https://www.iris-france.org/wp-content/uploads/2019/10/ARES-42-EDF-Italy.pdf>; <https://www.iris-france.org/wp-content/uploads/2018/09/Ares-30.pdf>

¹³ For more details see <https://ocean2020.eu/>

innovation policy. Indeed, the EU level is going to provide robust funds for R&T, the necessary trigger to join or lead European consortia, and the political argument to shield MoD funds committed to EU projects from potential cuts. Therefore, over time, the PNRM will likely align with the EDF work programme in order to enable the participation of the Italian DTIB to EU projects and get best-value-from-money through the synergy between national and European investments. The same applies to Italian prime contractors, mid-caps and SMEs, which, in fact, increasingly try to synchronize their research investments with EU agendas.

The Italian military as well as major players like Leonardo and Fincantieri increasingly see PeSCo and the EDF as incubators of robust procurement or research and development (R&D) projects related to capabilities which are considered crucial for the Italian armed forces and DTIB. It is not random that Italy launched a PeSCo project in November 2019, immediately joined by France and then by Greece and Spain, for a European Patrol Corvette¹⁴, which reflects well the cooperation between Fincantieri and Naval Group through the newly established company Naviris. In the land domain, Leonardo is bidding for the current EDIDP call on technologies for the next generation ground combat system with the goal of positioning Italy in the contest for the new European Main Battle Tank¹⁵. While de facto the EU level is increasingly becoming a reference point for Italian defence innovation and procurement, what is missing is a coherent defence industrial policy to prioritize investments, enhance the joint level, and steer public-private partnerships.¹⁶

¹⁴<https://www.navalnews.com/naval-news/2020/05/spain-joins-pescos-european-patrol-corvette-epc-project/>

¹⁵On Italy's option regarding Main Battle Tanks, see <https://www.iai.it/en/pubblicazioni/main-battle-tanks-europe-and-implications-italy>

¹⁶Michele Nones, "Nuova strategia industriale cercasi", in *Airpress*, Luglio-Agosto 2020, pp. 4-5

THE POTENTIAL OF SMES AND STRAT UP

Looking at the broader Italian economy, three considerations are in order. First, Italy possesses a solid research ecosystem composed of universities, and state-led as well private research centres. For instance, in advance domains such as artificial intelligence and machine learning, Italy punches above its weight in comparison to other countries. So far, however, this talent has not managed to transition its skills into the private market and/or into products.¹⁷ Secondly, the Italian economy is largely composed of a network of solid and advanced SMEs. Some of them specialize in niche areas where they possess a deep and long-standing expertise. It is not unlikely that such companies, so far not much involved into defence projects, will start to partner more actively with European companies for various EU defence projects. Last but not least, as software is eating the world – also in the defence world – a defence industrial transformation will probably occur.¹⁸ In Italy, this is likely to be driven by the dominant players as they possess the financial capital, the technical and bureaucratic expertise as well as the pre-existing technological capabilities to integrate software into new and future platforms.¹⁹ However, it is likely that through European defence projects some important defence-related start-ups may emerge in the near future.

CONCLUSIONS

Against this backdrop, the lack of a long-term, comprehensive strategy shared among the main military and industrial actors is going to hamper innovation and procurement efforts at national and European levels. Moreover, it does not help implement any meaningful reform in this field and curb the potential lying in high-skill professionals distributed among Italian universities, research centres, SMEs and large companies. At the same time, in the end the Italian defence innovation ecosystem is likely to adjust in a pragmatic way by continuing to perform with sufficient – albeit not optimal nor always efficient – results. *C'est la vie.* ■

¹⁷Daniel Castro, Michael McLaughlin and Eline Chivot, *Who Is Winning the AI Race: China, the EU or the United States?* (Washington, DC : Center for Data Innovation, 2019).

¹⁸Marc Andreessen, “Why software is eating the world”, *Wall Street Journal* (20 August 2011).

¹⁹Peter Dombrowski and Eugene Gholz, *Buying Military Transformation Technological Innovation and the Defense Industry* (New York, NY: Columbia University Press, 2006).

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ARES GROUP

The Armament Industry European Research Group (Ares Group) was created in 2016 by The French Institute for International and Strategic Affairs (Iris), who coordinates the Group. The aim of the Ares Group, a high-level network of security and defence specialists across Europe, is to provide a forum to the European armament community, bringing together top defence industrial policy specialists, to encourage fresh strategic thinking in the field, develop innovative policy proposals and conduct studies for public and private actors.

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