https://doi.org/10.22480/rev.unifa.2025.38.784
Estudo de caso
e-ISSN 2175-2567
Revista da UNIFA
revistaeletronica.fab.mil.br

The aerospace sector in Italy, Sweden and Brazil: alliances, economic development and industry

Gustavo Fornari Dall'Agnol 0000-0001-5566-0194
Departamento de Economia e Relações Internacionais, CNM, Universidade Federal de Santa Catarina, UFSC, Florianópolis, SC, Brasil

ABSTRACT

The aim of this study is to compare the aerospace industry inSweden, Italy, and Brazil, especially in the aerospace sector. These countries have significant similarities (e.g., aerospace industry, middle power status), but also very large differences(membership of military alliances, disparate levels of development). An analysis of this kind is important to identify the major factors that impact the aerospace industry, toinvestigate how and why they correlate with the success or failure of the sector. Italy has developed a strong aerospace industrial base over recent years, and now, as a member of an alliance, it is gradually aiming to develop other partnerships, reducing its dependence on North American imports. Meanwhile, Sweden, with its also longstanding industry, is now joining NATO and although its companies are already at the technological forefront, changes are expected, especially in its defence expenditure as a percentage of the GDP. Brazil has an advanced aerospace cluster for a developing country, but it is falling behind and this tendency will only be reversed by necessary measures such as investment, R&D,and budgetary management. The three countries have already collaborated in the aerospace industry, for example, onthe Gripen X program between Sweden and Brazil.

Keywords: Defence Economics; alliances; development.

El sector aeroespacial en Suecia, Italia y Brasil: alianzas, desarrollo económico e industria

RESUMEN

El objetivo de este estudio es comparar la industria aeroespacial em Suecia, Italia y Brasil, especialmente en el sector aeroespacial. Estos países tienen similitudes significativas (por ejemplo, la industria aeroespacial, el estatus de potencia media), pero también grandes disparidades (membresía en alianzas militares, niveles dispares de desarrollo). Un análisis de este tipo es importante para identificar los factores que más impactan en la industria aeroespacial, y cómo y por qué tienen esta correlación. Italia ha desarrollado una sólida base industrial aeroespacial en los últimos años y ahora, ligada a

la alianza, está gradualmente buscando desarrollar otras asociaciones, reduciendo su dependencia de las importaciones norteamericanas. Mientras tanto, Suecia, con su también secular industria, está ahora ingressando en la OTAN y, aunque sus empresas ya esténa la vanguardia tecnológica, se esperan cambios, especialmente en su gasto en defensa como porcentaje del PIB. Brasil tiene um clúster aeroespacial avanzado para un país en desarrollo, pero se está quedando atrás y esta tendencia solo se revertirá con las medidas necessárias en inversión, I+D, Gestión presupuestaria, entre otros. Los tres países ya colaboran en la industria aeroespacial, por ejemplo, en el programa Gripen X entre Suecia y Brasil.

Palabras clave: *Economía de Defensa; alianzas; desarrollo.*

O setor aeroespacial na Suécia, Itália e Brasil: alianças, desenvolvimento econômico e indústria

RESUMO

Neste breve artigo visou a comparar o setor aerospacial da Suécia, Itália e Brasil. Os países têm semelhanças importantes (indústria aeroespacial forte, são potências médias etc.), mas também discrepâncias muito grandes (fazer parte de alianças militares, nível de desenvolvimento díspares). Uma análise desse tipo é importante para identificar quais os fatores que mais impactam na indústria aeroespacial, e como e porque possuem essa correlação. A Itália construiu, ao longo dos últimos anos, uma forte indústria aerospacial, é membra de uma aliança e está em vistas de se desprender paulatinamente da dependência norte-americana. Já a Suécia, com uma indústria também secular, está adentrando a OTAN agora e, por mais que suas empresas já estejam na fronteira tecnológica, mudanças são esperadas, principalmente na relação gasto % PIB. O Brasil tem um cluster aerospacial avançado para um país em desenvolvimento, mas está ficando para trás. Essa tendência só será revertida por meio de medidas necessárias como investimento, P&D, equacionamento orçamentário, dentre outros. Os três países já colaboraram na indústria aeroespacial, a exemplo do programa Gripen X, entre Suécia e Brasil.

Palavras-chave: *Economia de Defesa; alianças; desenvolvimento.*

1 INTRODUCTION

In this study, I focus on the impact of alliances, economic development and external threat as potential variables which impact the performance of the industrial base and investments in the sector. The paper is analytical and utilizes a comparative framework based on the defence industry analytical framework and performance indicators put forward by Keith Hartley (2011; 2014). For example, the size and international placement of the firms, the technological stage of development of

projects, the proportion of expenditure dedicated to defence and the general output of the investment in security. These indicators provide a coherent view of a country's defence industry. Although there are many theories that can be applied to defence economics, Hartley's framework is the one best suited to the purpose of this article. The parameters developed in the area of economics of defence by Hartley and others are used for analysis due to the more empirical nature of this paper. In this sense, a historical comparative methods employed, although it is not based on a single theoretical perspective or background.

In this study, I compare the aerospace sectors in Sweden, Italy and Brazil. The first two are advanced democracies, which I argue are less volatile in procurement, acquisition and budgeting. Brazil has developed a successful aerospace sector, however, it may be lagging behind, not only in comparison to advanced economies but also to developing middle powers. There are connections between Brazil and the other countries Italy and Brazil have already collaborated on aerospace projects and Brazil is currently buying 36 E/F Gripens from Sweden with *offset* agreements, technology transfer, for example. At present, Italy and Brazil cooperate in the production of armoured vehicles. The main objective is to compare the effects of being a large developing country such as Brazil and the consequences of attempting to build a defence industrial base in comparison to countries with different characteristics. Italy has always been part of NATO and Sweden has just become a member; Alliance membership is certainly a variable to analyse. Sweden and Italy have centuries of experience in building defence equipment. The idiosyncrasies of each are explored in this discussion. Finally, in terms of social and political development, Sweden and Italy are ahead of Brazil; but in International Relations, the three might be considered "middle-powers".

2 ITALY'S AEROSPACE INDUSTRY

In the realm of international relations, Italy is often described as a middle power. In addition, itis a member of the North Atlantic Treaty Organization (NATO)and in fact, during the Cold War, Italy had limited scope to elaborate its own foreign policy and make independent choices in military spending and procurement. Defence spending in Italy is thus greatly affected by doctrinal and organizational guidelines. Italy did not free-ride and accomplished the famous 2% GDP defence expenditure advocated by NATO in order not to be a *free-rider*[1]. Being tied to NATO, however, has hampered the development of the country's defence industrial base (DIB)in accordance with its distinct strategic guidelines.

[1] In alliances, the most powerful country usually provides, through military investment, outputs in form of defence to the allies. In turn, the allies spend less in defence and can engage in a free-rider behaviour [if you use defence, then you should use behaviour; both are UK spelling], taking advantage of the security provided by the lead state and utilizing the resources for other priorities.

Nevertheless, Italy has been able to develop a highly innovative DIB. In shipbuilding, for example, Italy, with its centuries of experience, is at the cutting-edge of the market. It may be argued that this advantage is a consequence of merchant seamen navigating the Mediterranean. External threat is currently low in Italy and aside from possible Russian aspirations, will remain that way, although as a member of NATO, it may be called upon to confront China or Russia. In the past, high threat levels, for example the aspirations of the Habsburg Empire in the First World War, bolstered the development of DIB in Italy.

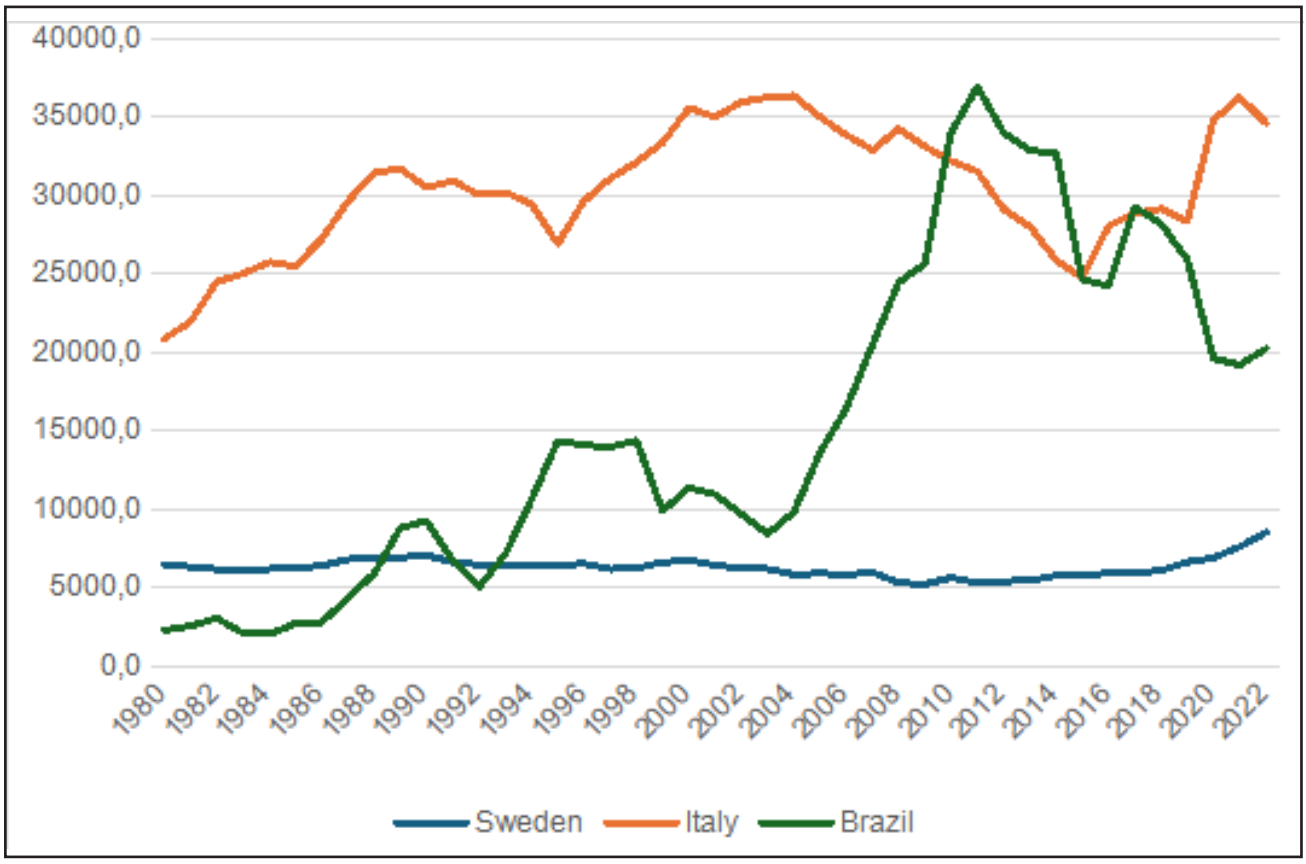
The defence market structure in Italy resembles an oligopoly on the supply side, with Leonardo (previously Finmeccanica) and Fincantieri dominating the market. Both are state-owned companies and are listed among SIPRI's (Stockholm International Peace Research Institute) top 100 companies. Italian firms have collaborated with several partners, previously Embraer in Brazil, and now with Japan and England on a project to develop the sixth-generation fighter, the Global Combat Air Program. The supply side, in terms of the largest companies, is divided into shipbuilding and aerospace. The first and third Italian national champions are in the aerospace business; Leonardo-Societa' per Arizoni and Ge Avio S.R.I. 2016: Balance sheets of these companies (AIDA apud Caruso, p. 293) indicated a €7,7 billion revenue for the former and €1,455 billion for the latter. Together, they employ around 35,000 people. Beyond the aerospace sector, other firms that demonstrate collaboration between Brazil and Italy are, for example, Iveco, that has a partnership with Brazil for building armoured vehicles, and Fincanteri and Orizzonte-Sistemi Navali, both shipbuilding firms.

There is a complex relation inside NATO. During the Cold War there was constant pressure for an increase in military expenditure, that continues to exist, especially since China has required greater attention from the U.S. Caruso and Di Domizio (2016) observed a positive association between European and U.S expenditure. In Caruso and Addesa (2012), the determinants of Italian military spending are highlighted. A negative association with US military expenditure between 1988 and 2008 suggested free-rider behaviour. In the aftermath of the Cold War, military spending decreased until 1995 before re-gaining momentum until 2004. Thereafter, a downward trend until 2015 is evident, as seen in Graph 1[2].

On the demand side, there has been an emphasis on export-led industrial policy linked with the alliance commitments. The government has focused on establishing partnerships, and defence has given way to commercial objectives. The pursuit of wealth and power are intertwined, as the mercantilists rightly argue.

[2] Such a negative trend is explained first in the light of the abolition of military conscription which occurred in 2005. In the period 2009–2015 the decrease can be explained by the severe financial crises in late 2008 which eventually became extremely pervasive in 2011 so imposing further budget cuts on public spending. (…..)

Graph 1 - Defence expenditure (Constant 2021 US$).



Source: SIPRI.

In Italy's most recent White Paper for International Security and Defence (2015)[3], exports are given priority. In this document, released in 2015, it is clearly stated that exports represent a useful tool in intergovernmental cooperation. Defence will continue to strengthen the domestic industry. Italy has always robustly supported its national defence industry. The country has used the national security exemption to protect its industrial base from European and international competition(Nones,1996; Pianta; Perani,1991)[4].

The goal of entering the U.S. market was accomplished with the F-35 project. Cameri FACO is assembling Italian F-35's and hasassembled Dutch F-35's.The workforce is expected to reach 6,500 employees. However, these commitments to F-35 assembly limit Italian collaboration with European partners, in the new Eurofighter, for example (Hartley, 2008) and, especially, PESCO.

[3] Available at: https://www.iai.it/en/pubblicazioni/italian-white-paper-international-security-and-defence. Accessed on: 31 May, 2023.[as you do not know the exact day, you may mention the last day of the month, because it would be certain that the content would already be available.

[4] Italy has pursued a strategy of national consolidation intertwined with an explicit support for exports of defence firms. In 2012, the Prime Minister issued a decree (DPCM 253/2012) to highlight which sectors and technologies were to be considered vital for the economic growth and the competitiveness of the country (Caruso, Raul p. 182).

In summarising Italy's aerospace force, only the Air Force will be taken into consideration. Although Army missiles, defence systems and naval aviation are also pivotal to a country's aerospace sector, since they are extremely important for the country's air defence, a *ceteris paribus* will be drawn, focusing on Air Force arsenal. In order to illustrate Italy's aerospace capabilities data was selected from the International Institute for Strategic Studies (IISS) and its Military Balance document. The same will be done for Sweden and Brazil.

In terms of fighters, Italy has a force of 93 Eurofighter Typhoons, 20 F-35A Lightning II, 2 F-35B Lightning II, 34 Tornado IDS ATKW and 15 Tornado ECR. Rafale provided 4 Maritime Patrol ATR-72 MP (P-72A). Electronic warfare can be provided with Italy's Beech 350 King Air and AEW&C 3 Gulfstream G550 CAEW.

In terms of tanker and transport aircraft, Italy's squadron includes33 medium TPT 76: 11 C-130J Hercules TKR/TPT; 4 KC-767A(5+ KC-130J tanker pods); 10 C-130J-30 Hercules; 12 C-27J Spartan; and 35 Light aircraft: 17 P-180 Avanti; 18 S-208 (liaison); PAX 8: 3 A319CJ; 2 Falcon 50 (VIP); 2 Falcon 900 Easy; 1 Falcon 900EX (VIP). Italy also has several training aircraft and helicopters (MRH; CSAR and SAR),alongside 6 Heavy 6 MQ-9A Reaper UAV's (Unmanned Aerial Vehicle), and an arsenal of air launched missiles and bombs[5].

The above-mentioned capabilities demonstrate a solid aerospace industry, although some of the fleet, such as the tanker aircraft, is aging and would benefit from replacement. Collaboration with Europe guarantees a solid aerospace fleet, with Typhoons, for example. Furthermore, its alliance partnership allowed Italy to participate and acquire the F-35, considered the best fighter in the world today. In terms of UAV's (Unmanned Aerial Vehicles), Italy still has to count on imports. Italy's defence industry has been shaped by its alliance commitments since the end of 1949.Future European collaboration is promising in terms of aerospace and should not be disregarded. Italy has managed to build, with its national champions[6], a solid innovative industry which provides security and defence to its country. Expenditure shows that internal politics does not substantially alter investments in defence. External threat is low and becomes lower because of the alliance. Nevertheless, Italy decided to invest in its DIB.

3 SWEDEN'S AEROSPACE INDUSTRY

Sweden has managed to develop an impressive defence industry in *per capita terms,* even though investment is not high. Its experience, however, dates back to the 17th century with the building of naval ships and cannons. Bofors, a company founded at the time, continues to produce missiles and artillery components. Naval ships and submarines are also strong in Sweden. This paper focuses mostly on SAA Band fighter jets. It is worth mentioning that Sweden's third biggest arms company, Nammo, is focused on rocket propulsion. There are also a number of very large, primarily civil-oriented companies, such as Volvo Trucks, Scania (trucks) and Trelleborg, that sell components, systems and platforms to the Swedish and other military forces.

[5] Source: IISS, 2024.

[6] There is a persistent argument that the existence of national champions prevents efficiency gains (Caruso, Raul, p.191). One can argue, however, that effectiveness subordinates efficiency in defence (Dall'Agnol, 2022).

The Saab Group accounts for about 75% of Swedish production of arms material. Of that, 45% of turnover is Aeronautics, the main product being the Gripen-C/D version, which became operational in 2004 (Lunmark, Martin, p. 293). The Gripen E/F version (also called Gripen NG) is in development, and is being co-developed with its first foreign buyer, Brazil, specifically the company Embraer. Brazil has initially ordered 29 aircraft. The Gripen E/F is Sweden's latest aircraft, with its longer range, stronger engine, extended fuselage and ability to carry a heavier payload, compared to the Gripen E. Saab has 16,400 employees (Lunmark; Martin, p. 293) and had a turnover of 31.4 billion Swedish kronas in 2017.

In 2014 and 2015, the Swedish government declared two "essential security interests": fighter aircraft and underwater capability. This can be understood in relation to the E.U. Defence Procurement Directive, where national preference (and thereby non-competitive procurement) must be justified by declared essential national security interests. The two main development projects directly related to these essential security interests – Gripen and A26 – accounted for around one third of the development and procurement budget in 2017,and with the associated support systems that are directly needed for the capability, the share is around 50%.

The largest defence spenders in Europe started collaborating on armaments in the 1950s. France, Germany, Italy and the UK engage especially in missile and aircraft development. These developments have gradually deepened integration and led to joint ventures and finally to industrial conglomerates such as Airbus, MBDA, EADS and Euro Torp in the 1990s and 2000s. Sweden did not really engage in armaments collaboration until the late 1990s. Examples of collaboration starting in the 1990s are Cision, Bonus, Meteor, Archer, IrisT, NH90 and Excalibur. In recent years, Sweden has engaged in fewer and smaller collaborations[7]. The primary exception is the bilateral development of Gripen E/F with Brazil, a conjoint development between Saab, Embraer and the Brazilian state. The Swedish state and Saab are also eagerly searching for an international partner for the development of the A26 submarine. In October 2018, Boeing and Saab won the US Air Force order for the next US trainer aircraft, the T-X. In its first phase until 2023, the project produced five T-X, and the program plans to produce 351 T-X aircraft. The system is expected to be fully operational by 2031 with all aircraft delivered. The aircraft is also likely to have very strong export potential, especially for international F-35 users. Saab's share of the program is around 10%, and its production will be undertaken in the U.S.

[7] See: Bofors-Giat (Fra), guided munition, start 1993; Iris-T: Saab-companies from five partner nations (Germany, Greece, Italy, Norway, andSpain, which wasreplaced by Canada during the development), 1995; Cision: Kockums and DCN (Fra), submarines, 1998; Meteor: Saab-MBDA (France, GermanyItaly, Spain, UK), beyond visual range air-to-air missile, 1998; Excalibur: BoforsRaytheon (US), guided artillery shell, 2002; NH90: Saab-NHI industries (together with Finland, France, Germany, the Netherlands, Norway, Sweden), helicopters, 2004.

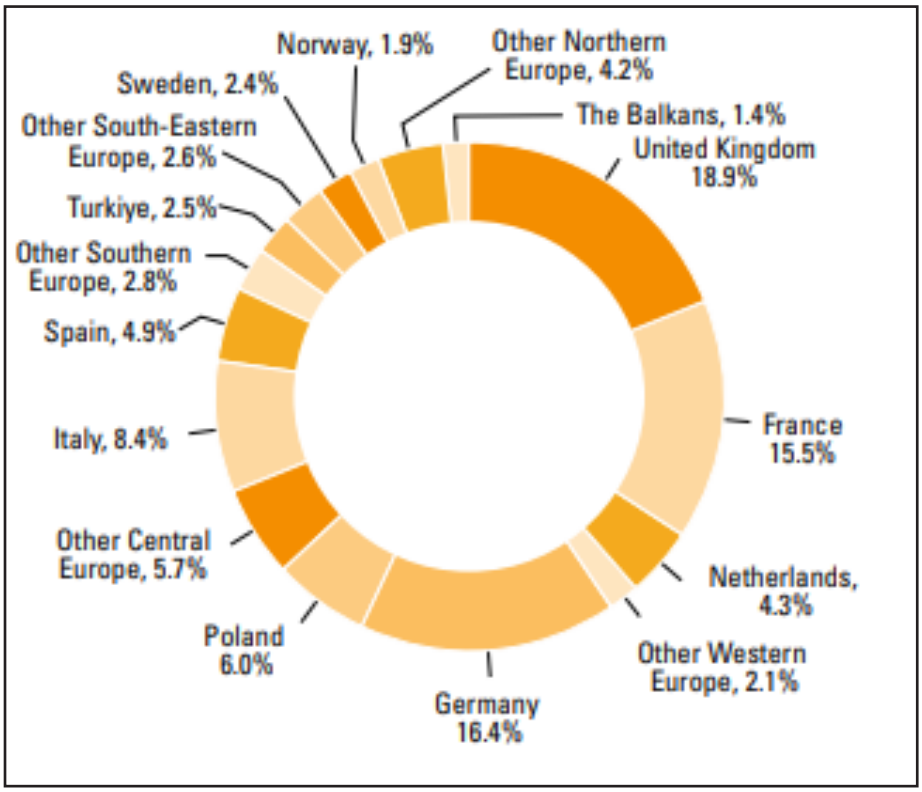
According to Lunmark and Martin (2020 p. 300),Sweden invests 33.2% of its defence budget in the Air Force, the remainder directed to logistics, support functions, operative management and the other services. It is a country that decided to specialize in submarines and jets. The main programs nowadays are the Patriot (Middle range ground-based air defence) and the Iris T (short range ground-based air defence). In comparison with Brazil, there is an important point to make. While Brazil aims at being a regional power and a global medium power, it lacks air defence capability. In a country so large, with many potential targets, and with many neighbours (albeit currently peaceful, this is a considerable gap in Brazilian DIB.

The Swedish 2019 White Book is ambitious. While there were some years of international openness and liberalization of the Swedish defence industry, and it certainly works with partners, some key technologies are national and will remain so. The White Book lists the following objectives: The defence budget shall gradually be increased up to 1.5% of GDP by 2025, up to a level of 84 billion Swedish kronas; The Gripen C/D will not be phased out by 2027, it will serve until 2038. Thereby Saab will have around ten more years of supporting the C/D. The C/D will serve as a capability complement to the E/F, and also as an advanced trainer. Two more Air Force divisions will be added, increasing the number to eight; and there will be Acquisition of a new trainer for basic pilot training. Air defence capabilities will be strengthened through the acquisition of air-launched cruise missiles and additional air-to-air missiles.

Sweden's Air Force has 99Ground/Attack planes with 96 being the JAS 39 C/D Gripen and Gripen and 3 being the JAS 39/E Gripen. It has one Tanker/Transport KC-130H Hercules and 5 C-130H Hercules (Tp-84); Light 2 Saab 340 (OS-100A/ Tp-100C); PAX 1 Gulfstream 550 (Tp-2) for Medium Transport Aircraft. It also possesses 3 AEW&C: 1 S-100B Argus; 2 S-100D Argus and two Elint's (Gulfstream IV SRA-5 (2-120B). Sweden has 8 RQ-7 *Shadow* Medium Sized UAV's and four kinds of Air-Launched Missiles: ASM AGM-65 Maverick (RB-75) AShM RB-15F • AIM-9L Sidewinder (RB-74); IIR IRIS-T (RB98); ARH AIM-120B AMRAAM (RB-99); and Meteor (IISS, 2024).

It can be seen that Sweden possesses a vast range of equipment and has opted for its own established firms. Sweden opted to develop the SAAB Gripen instead of importing F-35's. However, imports are necessary as can be noted in the case of carriers, missiles and drones, mostly imported from the United States. Also, it has to modernize its tanker fleet, and Brazilian's KC-390 would be a good option. Having joined NATO, it is expected that international collaboration will increase. European spending as a share of the GDP has increased (Figure 1) recently. Alliances and external threat impact directly the expenditure figures, as is the case of Poland, for example.

Figure 1 - Europe members share of defence spending (2023).



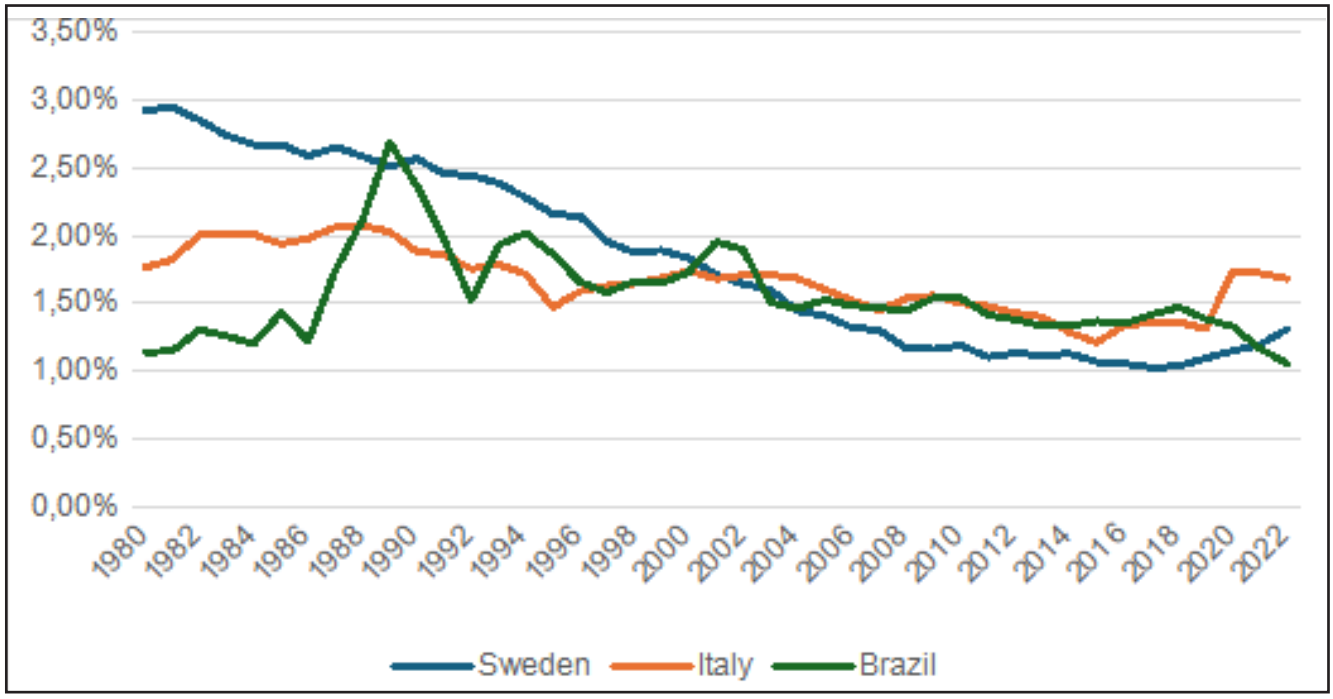
Source: IISS, 2024.

Authors like Andersson (2007), Ikegami (2013) and DeVores (2015) made different predictions for the Swedish economy. They anticipated that it would be more integrated to Europe, more internationalized, and would be specialized in niche actors with successful segments. All of them have some reason, although a form of *mercantilism* prevails when it comes to strategic assets. Sweden increased 40% of its defence procurement budget from 2013-2019 and now, facing the pressure of the war in Ukraine, joined NATO. Certainly, the alliance will change Swedish defence economics and probably expenditure will increase, and decision-making will not be so autonomous. Known for its outstanding social welfare, Sweden might have to sacrifice some of its resources to contribute to the alliance's burden-sharing.

4 BRAZIL'S AEROSPACE INDUSTRY

The first independent variable in this paper, comparing the prospects of the aerospace industry in the three countries, is whether they are part of an alliance or not. The second considers whether the level of economic development directly impacts the potential for investments in defence. Finally, external threat as a determinant for the level of defence expenditure is explored. Internal bureaucratic disputes and decision-making certainly affect defence economics, although these variables are not detailed in this paper.

Graph 4 - Military Expenditure as a % of the GDP (Current $2021).



Source: SIPRI.

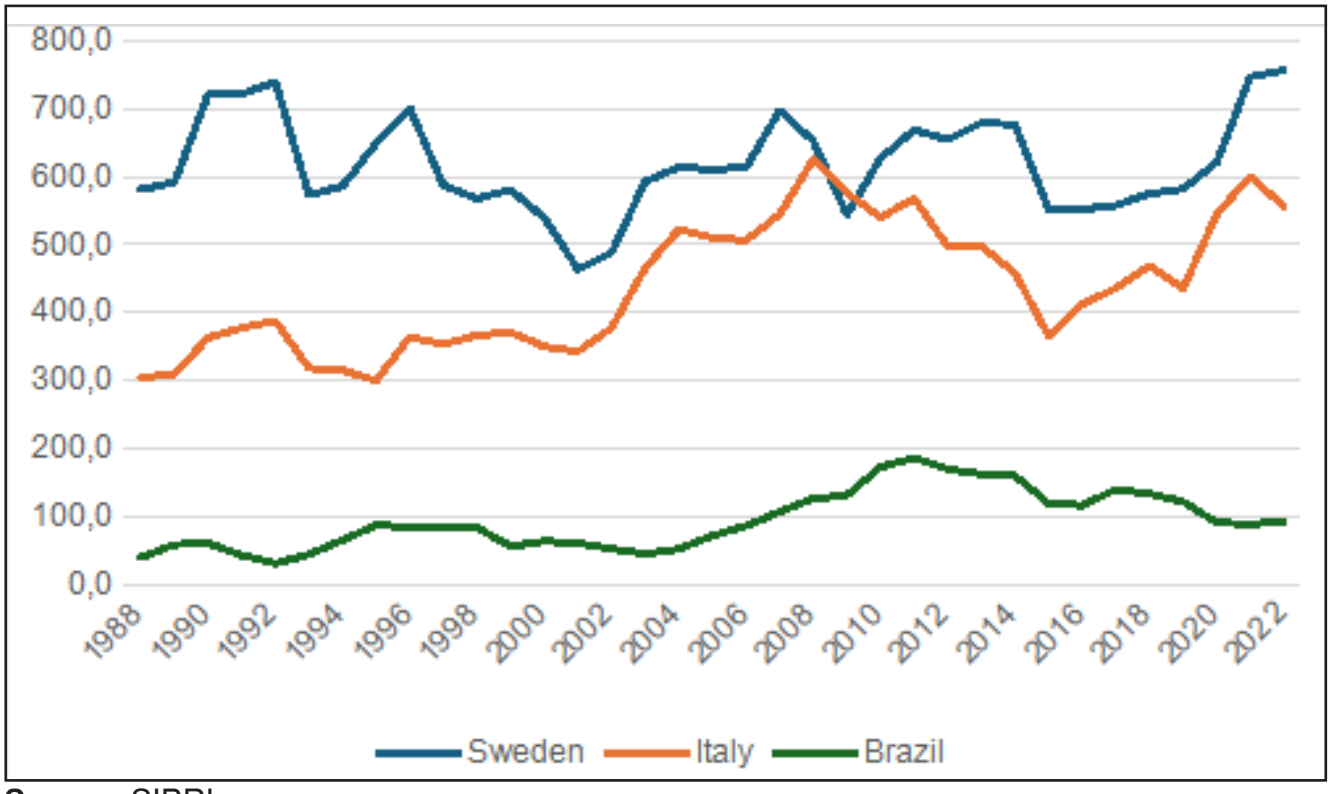
Although Brazil spent more than Sweden and more than Italy after the 2000's, it did not build such a cutting-edge technological defence industrial base. One case of success, at least presently, is the aerospace sector. As a developing country, Brazil has managed to establish an aerospace cluster around Sao Jose dos Campos, with its leading company, Embraer, and other suppliers building aircraft such as the Bandeirante, AMX A-1, A-29 Super Tucano, and the new cargo aircraft KC-390. The Brazilian industrial base was considered strong until the late 1980's. The process of liberalization and privatization reduced its scope and reach. However, firms like Embraer and Avibras are examples of companies which adapted to the process. Furthermore, around 80% of the Brazilian budget is already earmarked for personnel and pensions. Foreign investment is expressive in the Brazilian DIB, for example, the initiative of Iveco to develop the Guarani. In the Brazilian Air Force, besides the aforementioned Gripen, Brazil has bought off-the-shelf equipment such as the electronic warfare EMB 145 AEW&C, EMB-145 RS and the helicopters AS332 Super Puma, EC 135, UH-60 Black Hawk, and EC725 Super Cougar. Some projects and laws have been attempting to strengthen the DIB, as Law Nr. 12.598/2012. The rocket system Astros and the KC-390 are some examples of national large-scale defence projects. As for fighters, Brazil chose to import Saab's Gripens with offset deals, such as technology transfer and a production assembly line in Brazil. Defence is considered a monopsonic market and, as a result, the DIB requires regular demand from and commitment by the Armed Forces. However, fluctuations or low demand have resulted in firms exploring dual-use

technologies and exports, as in the case of Embraer, which is examining the possibility of a dual-use EVTOL (electric vertical take-off and landing aircraft).Despite being considered a success, Brazil's aerospace sector is lagging behind other middle powers such as Turkey and India.

Innovation is a difficult, risk-prone task. For developing countries and for large-scale projects, the challenge is even greater. Firms have to adapt to maintain competitive levels. Innovation is systemic since the components interact and reinforce one another. Furthermore, it varies according to sectors. Firms will innovate aiming appropriability conditions – extraordinary profits – and a better positioning in the global value chains. Brazil ranks low in innovation (Wipo, 2022).The Brazilian aerospace industry, despite facing growing competition from countries such as Turkey and India, is an exception.

There is a solid network of public and private actors that have assured the country's success in the sector. Embraer and Bombardier form a duopoly on regional jets. The KC-390 has had great success in exports as the demand for medium-sized cargo aircraft is high. The Brazilian Air Force supported the project but made important cuts that were, from Embraer's standpoint, compensated by exports. Brazil has a space program and has been able to build satellites, although attempts at building rockets failed. Nonetheless, combining efforts with domestic and international firms, Brazilian aerospace projects might aspire to a leading position.

Graph 5 - Military Expenditure Per Capita.



Source: SIPRI.

5 PRELIMINARY RESULTS

Italy is a developed country with a long tradition of producing defence equipment. Its level of development certainly impacts its possibility to invest in defence and innovative projects such as the Eurofighter Typhoon, that aims at being a sixth-generation aircraft. This is done by forging partnerships with other countries, alongside its own projects. Being part of an alliances has pushed Italy to invest in defence, even though its investments are usually above the 2% mark set by NATO as a standard. Alliances are also a source of development of the defence industrial base, even though it is not a *sine qua non* condition, since there are countries which engage in freeriding. Italy's external threat environment is relatively low, and different from Poland, for example, that cannot be considered a variable that determines the development of its aerospace industry.

Sweden, through its largest firm, Saab, is already at the forefront of the aerospace industry. Besides focusing on its internal markets, it has already forged important deals, such as exports and collaboration on its Gripen E/F project. Sweden's GDP per capita allows a growth in defence expenditures, even though it will have to choose between *guns and butter*. This growth in investments and defence expenditure is necessitated by the recent admission of Sweden into NATO. This may be expected to have a positive impact on the country's aerospace industry. As for external threat, despite not having a present external threat challenge, Russia's intentions as one of the reasons that led Sweden to join NATO. External threat increases resource mobilization and allocation to defence.

Brazil, as a developing country, has many difficulties in directing expenditure to investment and R&D in the defence industry. This is not only because of its development status but also because of resource allocation within the defence budget, with a disproportionate amount earmarked for personnel. Nonetheless, it has managed to establish a strong aerospace industry, in the civil and military markets. Projects like the Super Tucano and the KC-390 are successful. However, middle-size developing countries like Turkey and India are surpassing Brazil in the sector. Being part of an alliance would most likely pressure Brazil to revise its military spending priorities and lead towards a more effective rate of investment and budget equalization. Brazil's external threat level is low, which works against building a defence industrial base. However, threat level is not a necessary condition for developing capacities.

6 CONCLUDING REMARKS

The three countries analysed here are substantially different. Brazil is a developing country and is not in an alliance. Italy attains its commitment to the alliance and avoids freeriding. Brazil would probably benefit from an alliance to properly allocate its defence resources to innovation and modernization. Graph 5clearly highlights the differences. While Italy is in compliance with its alliance and Sweden has a very high GDP per capita, Brazil might not provide security for its citizens if the output of defence economics is defined as a non-rival and non-excludable public good. Buying off-the-shelf equipment, obtaining offset contracts, and focusing on a few niches for possible exports would be a good strategy. However, there are other macroeconomic variables that interfere heavily with the possibility of developing capabilities. As shown, within

the defence budget, there is limited room for investment, and the Congress and other actors do not play a decisive role in making defence spending more effective and efficient.

The three countries have similarities: they are successful in their aerospace sectors. The three are neither great powers nor states with no capabilities of their own. They are also subject to low threat level, which does not provide a compelling reason for the immediate development of capabilities. Brazil is a big market and has options to buy off the shelf. Imports must offer contracts that guarantee benefits for Brazil. The greatest difference between Sweden's and Italy's success when compared to Brazil, besides the cited alliances, is economic effectiveness: Steadiness of investments and defence budget management, allocation of discretionary expenses to the pertinent programs and diminishing the level of mandatory expenses. This is certainly connected to the level of development of the three countries, although it is not an impossible challenge for Brazil.

Informações sobre os autores:

Gustavo Fornari Dall'Agnol
https://orcid.org/ 0000-0001-5566-0194
http://lattes.cnpq.br/1151240380228469
gustfd@gmail.com

Atualmente, é bolsista de pós-doutorado do INCT- Observatório de Capacidades Militares e Políticas de Defesa. Doutor em Relações Internacionais pela PUC-MG onde também realizou estágio pós-doutoral. Mestre em Economia Política Internacional pelo Instituto de Economia da Universidade Federal do Rio de Janeiro (UFRJ). Bacharel em Relações Internacionais pela Universidade Federal de Santa Catarina (2010-2014). Atuou como Professor na PUC-MG. Atuou como Professor Substituto na UFSC. Trabalha com: Tomada de Decisão; Inovação, Indústria e Economia da Defesa; Economia Política Internacional e Teoria das Relações Internacionais. SeniorResearch Fellow at ISAPE.

Contribuições dos autores:

Conceituação; aquisição de financiamento; investigação; supervisão; validação; visualização; escrita; escrita revisão e edição.

Como citar este artigo:

ABNT

DALL'AGNOL , G. F. The Aerospace sector in Italy, Sweden and Brazil: aliances, economic development and industry. **Revista da UNIFA**, Rio de Janeiro, v. 38, p. 1-15, 2025.

APA

DALL'AGNOL , G. F. (2025, Fevereiro) The Aerospace sector in Italy, Sweden and Brazil: aliances, economic development and industry. **Revista da UNIFA**, Rio de Janeiro, 38 (1), P. 1-15.

REFERÊNCIAS

AIDA. The defence industry in Italy (Dezember 31, 2017): Balance sheet 2016 *apud* CARUSO, Raul. The Italian defence industry. In.HARTLEY, Keith. **The Economics of the Global Defense Industry**. New York: Routledge, 2019.

ANDERSSON, J. J; '**A New Swedish Defence for a Brave New World'.** In. **Matlary&Österud (eds), Denationalisation of Defence - Convergence and Diversity**. Ashgate, pp. 135–156, 2007.

CARUSO R., DI DOMIZIO M. Interdependence Between US and European Military Spending: A Panel Cointegration Analysis (1988-2013).**Applied Economics Letters**, vol. 23, n.4, 302–305, 2016.

CARUSO R., LOCATELLI A. Finmeccanica amid International Market and State Control, a Survey of the Italian Military Industry. **Defence and Peace Economics**, vol. 24, n.1, 89–104, 2013.

CARUSO, Raul. The Italian defence industry. In: HARTLEY, Keith. **The Economics of the Global Defense Industry**. New York: Routledge, 2019.

DALL'AGNOL, G. F. **Defense,Decision-making and Political Economy: Large-scale projects and the decision-making process in United States' defense politics.** Belo Horizonte: PUC-MG, 2022. Available:http://www.biblioteca.pucminas.br/teses/RelacoesInternacionais_GustavoFornariDallagnol_29820_Textocompleto.pdf. Accessed on: 18 August 2022.

DEVORE, Marc, **Defying Convergence: Globalisation and Varieties of Defence Industrial Capitalism.** In. New Political Economy, Routledge Vol. 20, No.4, pp. 569–593, 2015.

EDA: EUROPEAN DEFENCE AGENCY. Available at: https://eda.europa.eu/. Access at: 31 March, 2024.

GILLI; Andrea. Alessandro, Riccardo Ungaro. Marrone, Alessandro. 2015. **Italian White Paper.** Available at: https://www.iai.it/en/pubblicazioni/italian-white-paper-international-security-and-defence. Accessed on: 31 May 2024.

HARTLEY, Keith, **The Economics of Defence Policy: A new perspective**. New York: Routledge, 2011.

HARTLEY, Keith. **The Political Economy of Aerospace Industries: A key driver of growth and international competitiveness?**Northhampton: Edward Elgar, 2014.

IISS. **Military Balance 2010**. Available at: https://www.iiss.org/publications/the-military-balance/. Accessed at: March 2024.

IKEGAMI, Masako.'The End of a "National" Defence Industry?–Impacts of Globalization on the Swedish defence Industry'. **Scandinavian Journal of History**, Vol. 38, No.4, pp. 436–457, 2013.

International Monetary Fund (IMF). **Datasets**. Available at: https://www.imf.org/external/datamapper/datasets. Accessed on: 31 March 2024.

LUNDMARK, Martin, OXENSTIERNA, Susanne. **Koordineringochprioriteringavinternationellasamarbeteninom materiel-ochlogistikområdet. Coordination and prioritization of international cooperation in the defence acquisition and logistics domains.** FOI- R4388 SE, FOI, Stockholm, 2016.

NONES M. **L'Economiadelladifesa e ilnuovomodellodidifesa**. IAI quaderni 1, 1996.

PIANTA, M., Pierani, G, **L'industriamilitare in Italia**. **Ascesa e declino dellaproduzionediarmamenti.** Roma,Edizioni Associate, 1991.

SIPRI. **SIPRI Yearbook**. **2022**. Oxford: Blackwell, Oxford (for Stockholm International Peace Research Institute. 2023.

SWEDISH GOVERNMENT, Värnkraft.**Resilience Ds 2019:8.** /. Access at:www.regeringen.se/ 49a295/globalassets/regeringen/dokument/forsvarsdepartementet/forsvarsberednin gen/slutrapport-14-maj/defence-commissions-white-book-english-summary.pdf. Accessedon: 31 March 2024.

THE WORLD BANK. **World Bank Open Data**. Available at: https://data.worldbank.org/. Accessedon: 15 March 2024.

WORLD INTERNATIONAL PROPERTY ORGANIZATION. **Global Innovation Index 2020**. Available at: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2020.pdf. Accessed on: 14 July 2022.

Received: 06/17/2024

Accepted: 01/30/2025