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Creating a Competitive Environment for Defense Aerospace in a Protectionist Multipolar World: A Study of India and Israel

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Cover Page Footnote

Shlok Misra is an undergraduate at Embry-Riddle Aeronautical University, Daytona Beach. He is currently pursuing a Bachelor of Science in Aeronautical Science, with a minor in Airline Operations and Business Administration. Shlok is passionate about using technology for enhancing airspace efficiency and safety. Shlok's research also focuses on studying human factors to enhance aviation safety. Shlok is currently a Commercial Pilot with an instrument rating. Tanish Jain is an undergraduate at the University of California, San Diego. He is currently pursuing a Bachelor of Science in Electrical Engineering, with a focus on Machine Learning and Controls. Given his engineering background, he closely watches technological advancements in the defense space, and is keenly interested in defense aerospace policy.

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Creating a Competitive Environment for Defense Aerospace in a Protectionist Multipolar World: A Study of India and Israel

Shlok Misra & Tanish Jain

Abstract

The paper studies protectionism in defense aerospace in a multipolar world and analyzes the strategies of two emerging powers: India and Israel. The emergence of protectionism in a multipolar world has left a visible and influential impact in the globally integrated defense industry. As the world has become increasingly multipolar, new military powers have emerged around the world. India and Israel are disparate in terms of their size, wealth, and international relations. There are interesting similarities between them when it comes to their defense strategies. As a result, they also present compelling case studies for understanding protectionism in a multipolar world, specifically in the defense aerospace sector. This paper studies the current strategies adopted by the two nations in their defense aerospace manufacturing sectors. The paper evaluates differences and similarities between the two nations in terms of the issues faced by the defense aerospace sectors of the two nations and the potential that lies ahead for them. In the recommendations made, it was discussed how Israel needs new defense partners to reduce its over dependence on the United States, while India needs to boost manufacturing in its defense aerospace industry through specific tax reforms and bureaucratic reforms. While India and Israel need to regulate the defense aerospace industry to some extent for national security reasons, they should open their industries to other countries and find favorable partners to do so.

Introduction

With the collapse of the Soviet Union towards the end of the last century, the Cold War came to a close. The end of the Soviet Union convinced the world that the United States (U.S.) was the single muscular power in the world. As the new century dawned upon us, the balance of power was undergoing a gradual shift and its effects have been amplifying ever since. Multiple power centers other than the U.S. rapidly emerged in terms of economic, technological, and military strength. In the period from 1978 to 2004, China's economy grew at an average of 9.5%, that is the largest economic expansion in the world (Bi, 2005). Similar economic, technological, social, and military growth has been achieved by other nations, such as India, Japan, most European Union nations, and Brazil, that has led to a shift in global power dynamics. The world has truly become multipolar and the influence of emerging market countries has never been larger. Emerging market countries—such as India, Russia, Israel, Brazil, and Indonesia, among others—currently hold 3/4th of the world's foreign exchange reserves and are augmenting their contributions exponentially in global growth and leading the world into having a more "diffuse distribution of economic power" and, in turn, a more multipolar arrangement (World Bank, 2011, pp.8).

This rapid transformation in global geopolitics was not without a similar transformation in defense ties among nations. Following the two World Wars in the 20th century, countries scrambled to form alliances and create treaties that would dampen the possibilities of another major war. Through formal or informal pacts/agreements or alliances, nations became more connected and allied than ever before. This has given rise to treaties like the North Atlantic Treaty Organization, ANZUS (consisting of Australia, New Zealand, and the U.S.), and the 'Security Treaty between the U.S. and Japan' formed in 1951.

Defense treaties can guarantee international support and collaboration during a conflict with a so-called 'common enemy.' While a defense treaty can prevent isolation during a conflict, treaties often demand large financial and humanitarian commitments that might seem economically unfeasible and unreasonable. Consequently, some countries may feel shortchanged by these treaties, viewing them as being disproportionately burdensome towards themselves. As a result, following the peak of global cooperation towards the end of the 20th century and the beginning of the 21st century, there has been a reversal: Traditional powers have gradually withdrawn from actively encouraging different forms of globalization and global cooperation.

This has, in part, been a cause for a gradual move towards protectionism across the world. The defense sector has not been immune to this trend: An increasing number of countries are shielding their domestic defense industries from foreign competition. Interestingly, while protectionism in general trade seems to be driven by inter-governmental relations, domestic politics, and as a means to "correct" trade deficits, national security and self-sufficiency are generally cited as reasons to justify protectionism in the defense sector.

The emergence of protectionism in a multipolar world has left a visible and influential impact on the globally integrated defense industry. As the world has become increasingly multipolar, most new military powers have emerged in Asia. China, for example, has strengthened its military to almost rival that of the U.S. in certain areas, that until recently was the sole nation with a robust global military presence. Others have come up as important regional powers with ambitions to assert their dominance internationally. In this paper, we specifically look at two such powers: India and Israel. While both these nations are disparate in terms of their size, wealth, and international relations, there are interesting similarities between them when it comes to their defense strategies. As a result, they also present compelling case studies for understanding protectionism in a multipolar world, specifically in the defense aerospace sector. We will focus our discussion on the defense aerospace sectors in these two countries, and this paper will:

- Evaluate India and Israel's geopolitical constraints and the future of their defense aerospace industry;
- Recommend strategies towards creating a competitive environment for growing their defense aerospace industries; and
- Evaluate strategies India and Israel need to adopt to utilize the advantages of protectionism in this multipolar world to develop their defense aerospace industries.

India

India's geopolitics has been defined by its strategically volatile location as it shares borders with Pakistan and China, with whom it has had strained relations. Although there is a significant disparity in the status of its relations with its neighbors, India's defense strategy has largely been dictated by its geopolitical situation with Pakistan and China.

Despite cultural and historical ties, the India-Pakistan relationship has been strained ever since the formation of these countries in 1947. The tensions between these two neighbors are born out of, and play themselves in, the region of Kashmir, a disputed territory, that both nations control partially but claim entirely. The two nations have engaged in several military confrontations since their formation, three of that have escalated into wars.

On the other hand, while China and India share a positive trade relationship, the status of their diplomatic ties has fluctuated, that remains tense. Again, the tension arises, among other reasons, from territorial disputes. China lays claim to the North-Eastern Indian state of Arunachal Pradesh, that was one of the causes of the Sino-Indian War in 1962. India is also suspicious of China as it shares friendly relations with Pakistan. Moreover, China controls a part of the disputed territory of Kashmir called Aksai Chin, that further complicates the Kashmir issue, as well as India-China ties.

Indian Defense Aerospace: Background

India is one of the world's highest spenders when it comes to military expenditure, and it also maintains the world's 4th largest military by size (Tian, Fleurant, Kuimova, Wezeman, & Wezeman, 2019). Despite this, India's aerospace industry is still heavily dependent on imports from other countries. The Indian Air Force (IAF) receives the largest chunk of defense capital budget allocation, a large part of that is spent on these imports (Keval, 2019).

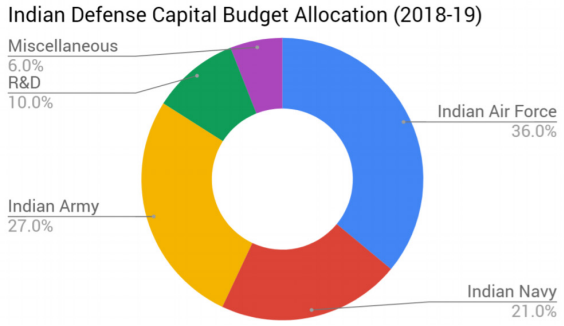

Figure 1. Allocation of capital expenditure budget of the Indian Defense Forces (Keval, 2019).

Despite large domestic demand in the defense aerospace sector, India's internal defense aerospace industry remains relatively modest. India imports the majority of its defense equipment (including defense aerospace equipment) and is one of the world's largest defense aerospace importers (Tian, Fleurant, Kuimova, Wezeman, & Wezeman, 2019). This heavy reliance on other nations for its defense aerospace industry has been a pain point for India's security establishment, that has wanted to reduce India's dependence on foreign suppliers. As a result, India has initiated several policies to develop military equipment indigenously.Historically, the Indian government has sought to directly implement this approach by establishing public sector companies. It is estimated that about 95% of the country's defense manufacturing presently happens in the public sector (Jayaraman, 2016). A handful of public sector organizations form the backbone of India's defense aerospace industry, the most prominent of that is Hindustan Aeronautics Limited (HAL). India's defense aerospace manufacturing has primarily been carried out by HAL and the lack of private enterprises has not only restricted competition but also strained the industry of human resources and capital (Krishnan & Sachitanand, 2019).

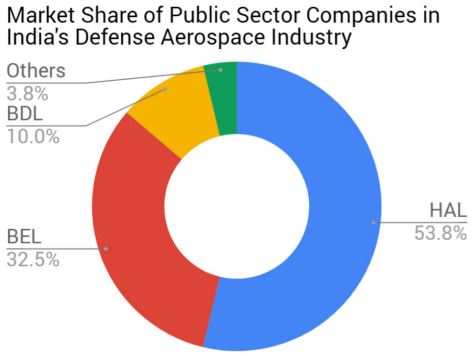

Figure 2. Indian Defense Aerospace market share (Krishnan & Sachitanand, 2019).

The HAL Tejas, a light combat aircraft built by HAL, is a prime product of the effort by the government to form a robust domestic manufacturing base. As of March 2019, the IAF had 16 HAL Tejas and is expected to receive another 16 by the end of the year (Mathews, 2019).

Currently, the HAL Tejas is only built for the IAF, but HAL has expressed interest in exporting the Tejas to allies as well (TNN, 2019).

Indian Defense Aerospace: Present Scenario

While India has been plagued by a lethargic growth in the defense manufacturing sector with weak production rates, high unit costs of productions due to inefficient production methods and equipment, and obstructive bureaucracy, key steps have been taken in the past decade to re-energize the industry.

India has not traditionally opted for protectionism in the defense sector. While India has always built on efforts to strengthen its domestic defense aerospace manufacturing—public sector and recently private sector—it has not adopted traditional policies of taxing imports and setting up trade barriers for imports. This has been mainly due to a weak domestic manufacturing industry that has been incapable of feeding the large demands of the industry and good defense trading ties with countries like Russia and France, that has helped

India lobby with these countries to promote its other geopolitical and economic interests in the global community. Critics of India's strategy might argue that adopting protectionism in the 1960s through the 1980s would have helped develop the Indian domestic industry and relieved it from its heavy imports. However, the mid-to-late 20th century saw India compete with Pakistan in three wars (1965, 1971, and 1999) and China in one war (1962). Consequently, there was a huge and urgent demand for defense equipment and India could not afford to adopt protectionism in that period.

The IAF has a wide fleet, including squadrons of Sukhoi Su-30, Dassault Mirage 2000, Mikoyan-Gurevich MiG-21, Mikoyan MiG-29, and Mikoyan MiG-27 (Government of India). Notably, the IAF has diverse equipment lines: It sources aerospace equipment of any given type (such as that related to combat aircraft, rescue aircraft, trainer aircraft, etc.) from various contractors based in multiple countries. This has resulted in additional costs related to integrating technology platforms and personnel training to operate across these platforms (Kanwal & Kohli, 2018).

Another issue faced by the IAF is its aging fleet, with almost half of it set to retire soon (Stacey, 2016). Although this means that IAF currently faces high operational costs to service its aging aircraft, it also presents a remarkable opportunity for defense manufacturing as the demand for defense aerospace equipment is set to accelerate (Keval, 2019). As a result of its immense appetite, India is considered an attractive market for sales in the defense aerospace sector. Despite this attractiveness, defense manufacturing in the aerospace sector in India has not met its full potential. This is largely because of the complexity of obtaining contracts and approvals arising from cumbersome bureaucracy and complicated tax laws that specifically govern the defense aerospace sector (Kanwal & Kohli, 2018). Additionally, due to these reasons, the private sector has largely stayed away from participating in defense manufacturing, especially defense aerospace manufacturing. At the same time, this has also meant that foreign investment in the sector has been constrained (Krishnan & Sachitanand, 2019).

More recently, as a result, India has been actively moving towards a hybrid form of protectionism currently for its private and public defense manufacturing. Foreign companies are allowed to supply and produce equipment for the IAF, but by partnering with Indian companies for production, they can avoid high taxation and trade barriers (PricewaterCoopers, 2018). The result of this outward-looking strategy has seen stalwarts like Lockheed Martin announcing the production of F-16 wings in India. Separately, on 19th July 2019, Lockheed Martin signed a Memorandum of Understanding with three startups from India, that were aimed at inculcating the start-ups into the production cycle and supply chain of Lockheed Martin in India (Shukla, 2019). In another breakthrough, The Boeing Company collaborated with Indian giant Tata through their enterprise Tata Advanced Systems to produce the fuselage of the AH-64 Apache helicopters (Economic Times, 2018). The equipment produced will supply Boeing's global supply chain. The Indian government has been leading efforts towards international investments in the industry by allowing more than 50% Foreign Direct Investment in Indian companies (Singh, 2019).

India has adopted similar initiatives with its public sector company HAL as well. The Indian government's effort to bolster HAL has extended to multiple international agreements, such as agreements with Boeing and Sukhoi. HAL is a member of the Sukhoi/HAL Fifth Generation Fighter Jet program, that is aimed at launching a refurbished and augmented version of the Sukhoi Su-57. HAL is also licensed to produce the Sukhoi 30MKI and is expected to produce more than 220 jets by the end of 2019. (Defense World, 2019). Unfortunately, despite strong support from the Indian government, HAL has recently faced turbulent times financially, posting losses in the first two quarters of 2019 (Krishnan & Sachitanand, 2019).

Israel

Israel has numerous geopolitical constraints and its conflict with Palestine and its Arab neighbors has defined much of its geopolitical history. Israel has been involved in a multitude of conflicts

with its Arab counterparts with regional wars in 1948, 1967 and 1973, and two Lebanon wars in 1982 and 2006. Due to its location and multiple unsolved conflicts with Iran and Palestine (backed by other Arab nations), Israel has invested heavily in its military and has transformed itself from a largely agrarian economy to an economy that boasts of high technological growth in multiple sectors.

Owing to its complicated geopolitical situation, Israel is highly dependent on diplomatic support from other nations. While most European nations and some Asian nations, such as India, enjoy healthy intelligence sharing, technology collaborations, and trading relations, Israel finds its most loyal and robust diplomatic supporter for its geopolitical causes in the U.S.

Israel enjoys good trading relations with China as well. However, its close alliance with the U.S. and its dependency on the U.S. for aid has restricted that relationship. According to Dr. Alex Coman, technology and economics specialist at the Adelson School of Entrepreneurship, Israel and China have friendly relations and collaborate on technology projects; however, Israel is wary of pressure from the U.S. to develop this into a strong business relationship (Mintner, 2019).

Israeli Defense Aerospace: Background

Due to its geopolitical issues, Israel's defense aerospace demands are considerably high. Israel has a fairly mature domestic defense aerospace industry, and it is considered a leading exporter of Unmanned Aerial Vehicles (UAVs) globally. Nevertheless, the Israeli Air Force (IsAF) remains heavily dependent on foreign equipment, specifically, from the U.S. Israel is a large market for the U.S.' military aircraft exports—for example, Israel has the world's largest F-16 fleet outside the U.S. Additionally, Israel is also the largest beneficiary of U.S. military aid, amounting to a massive $3.8 billion in 2019 (Spetalnick, 2016).

Israel's defense aerospace industry grew along with the rest of the defense industry out of necessity during the late 1960s when Israel was embargoed by its European allies while facing a series of regional military escalations. In the following years, the industry also depended on its American partners for support in the form of funding and technology exchange.

While Israel continues to be dependent on imports from the U.S. for military combat aircraft and related equipment, it has a well-developed defense aerospace industry: It is a pioneer in Unmanned Aerial Systems (UAS) and is the leading UAV exporter in the world, accounting for nearly half of all drones sold in the previous decade (Defense Update, 2013). The industry makes annual sales of about $4 billion, making Israel a leader in this sector (Defense Update, 2013). The Israel UAV fleet is entirely Israeli produced with UAVs like IAI Heron, IAI Eitan, Hermes 900, and Hermes 450. All the UAVs currently operated by the Israel Air Force are surveillance drones. The Heron family of drones, produced by IAI, is among the most widely sold internationally (UPI, 2013).

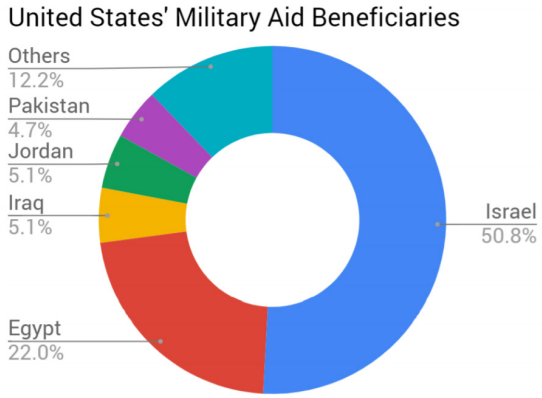

Figure 3. U.S.' Military Aid Beneficiaries (Spetalnick, 2016).

Israel is the world's 6th largest defense exporter, with a mature industrial environment consisting of over 150 defense companies. Nevertheless, the industry is dominated by three key players - Israel Aerospace Industries (IAI), Elbit Systems, and RAFAEL - that are also the major players in the defense aerospace industry, with IAI being the largest of the three (Research and Markets, 2019).

Israeli Defense Aerospace: Present Scenario

Israel has adopted different strategies for its manned and unmanned aircraft vehiclesdevelopment, even though they come under the same horizon of defense aerospace.

Israel has adopted a traditional protectionist strategy to develop its UAVs industry. Israel Air Force does not use any imported UAVs due to the barriers put in by the government. In fact, the import tariffs on UAVs imported from other European nations are extremely high depending on the purpose and nation of manufacturing that the private sector in Israel has adopted locally produced Israeli UAVs as well.

On the other hand, Israel's Air Force is entirely dependent on the U.S. for its manned missions. This is largely because a large part of the massive military aid that Israel receives from the U.S. is used to buy military equipment from the U.S. (Spetalknick, 2016). Israel's procurement of the F-35I has completely been funded by American aid (Defense Industry Daily, 2019). Israel's outward-looking strategy for its manned equipment is very similar to India's strategy in the 20th century due to its volatile geopolitical situation. Israel was in desperate need of defense equipment in the mid-to-late 20th century due to its troubled relations with the Arab allies and the embargo by the Europeans. This was a time when the U.S. was Israel's staunchest ally and Israel could not afford to impose any restrictions on American products. This dependency is deep-rooted and its effects have carried on ever since. Nevertheless, Israel was able to form an independent UAVs industry due to its stable economic, social, and geopolitical growth in the late 20th century.

Even though the Israel defense aerospace industry consists of both public sectorcompanies (such as IAI) and private sector companies (such as Elbit), interestingly, they may be subject to different government regulations despite operating within the same industry (Sadeh, 2018). For instance, Israeli labor law is governed by a clutch of laws, including the Basic Laws, that are a set of constitutional laws. Under current practices, public sector companies are subject to more stringent collective bargaining agreements, that means that employees of public sector companies can unionize more easily and exercise greater leverage than they would in a private sector company (Sadeh, 2018).

Another issue plaguing the Israeli defense aerospace industry is the lack of transparency in defense procurement. Israel has among the lowest ratings for transparency for defense procurement among Organisation for Economic Co-operation and Development (OECD) nations, according to Transparency International, a global non-profit anti-corruption watchdog (Transparency International, 2013). This has disincentivized the participation of the private sector, as the majority of government contracts historically have been awarded to public sector firms in non-transparent tendering procedures.

India & Israel: A Comparison

Similarities

Geopolitical Situation

India and Israel have similar geopolitical situations in that they have strained relations with their immediate neighbors. In either case, these hostile relations have acted as catalysts for military development and a growing focus on modernization.

Public Sector-Driven Defense Aerospace Industries

Both India and Israel have had public-sector enterprises dominating their defense aerospace sectors. In fact, there has been the dominance of a single public-sector player in each case: India's defense aerospace growth has been spearheaded largely by HAL, while Israel's has been driven by IAI.

Large Industry Appetite and Strong Growth Projections

India has placed high strategic importance on expanding and modernizing its defense aerospace sector. The Indian government has allocated $30 billion towards modernizing the Indian military until 2024. A lot of Israel's jets are also aging, with the F-15s delivered in the late 1970s. The IsAF is looking to expand and modernize its fleet by striking new deals with American manufacturers like Lockheed Martin and Boeing. Israel has been a crucial member of the F-35 Joint Fighter Program and with the initial F-35s operational for the Israel Air Force, Israel's Ministry of Defense is close to striking a deal with Boeing for the new F-15IA.

Israel and India are following similar trends of expansion and modernization.

Dependence on Imports

India and Israel are highly dependent on imports to fulfill their defense equipment needs. While India imports its manned equipment from Russia and France, Israel has just depended on the U.S. for its fighter jets. Even as both countries have attempted to provide a fillip to domestic manufacturing, the vast majority of their equipment is purchased from foreign countries.

Differences

Stage of Industry Maturity

India and Israel share close defense ties in their defense aerospace industries. Despite the two nations working closely together, the two nations are at different stages of their industry maturity. Israel houses a robust defense manufacturing industry that has been a pioneer in building UAVs. Israeli-built UAVs are being used by militaries around the globe, including those of India and the U.S. Israel has also been a vital contributor and manufacturer in jet programs, such as the F-16 and F-35 Joint Strike Fighter Program. Even though Israel has not entirely launched any popular jet fighter indigenously, it has held vital and influential contributions in foreign partnerships with the most recent and renowned being the F-35 flight and stealth enhancement that was led by Israel. The enhancement led to the F-35I 'Adir', that is the only variant launched entirely for a foreign country's specification and enhancements (Defense Industry, 2019).

India, on the other hand, has been more sluggish with its indigenous defense aerospace developments. India's complex bureaucracy, complicated tax structure, lack of tax incentives and monetary support for defense manufacturing, meager supporting infrastructure, and limited resources adhering to military standards are some factors that have stagnated innovation and growth. This has led to a shortfall in private and foreign investments in the past and long gestation periods.

Number of Defense Partners

India enjoys defense partnerships, especially for its Air Force, with a diverse group of nations. While its fighter jets have been exported from Sukhoi and Mikoyan-Gurevich in Russia and Dassault in France, its Unmanned systems are imported from IAI in Israel. India inducted its first heavy-lift helicopter C-47 Chinook in March 2019 that has been manufactured by American company Boeing Vertol (IANS, 2019). India has a very wide network of defense aerospace trading partners that has relieved it off over-reliance on any particular nation.

Israel's inventory is restricted to either locally produced surveillance UAS or American produced fighter jets. American support has boosted Israel's might against regional rivals like Iran. Israel has extensively worked on F-35 prototypes and six Israeli companies are named as contracting partners in the partnership. Israel's IAI has manufactured the outer wings of the aircraft and Israel will also produce the helmet-mounted display for the F-35s (Military and Aerospace Electronics, 2012). Israel's extreme proximity to Washington DC on defense aerospace has largely restricted Israel's collaboration and dealings with other nations in terms of import of equipment and technology. Nevertheless, Israel exports its UAVs extensively to countries like the U.S., India, and the United Kingdom.

Recommended Strategies

The driving force for any industry's sustainability in the 21st century is its ability to maintain efficiency while being innovative. The defense aerospace industry is no different - it can continue to be attractive only if it continues to be efficient and innovative. A central factor that has been responsible for some countries having successful defense aerospace industries has been their ability to create a competitive environment for the players in the industry to operate in. The Department of Defense (DoD) of the U.S. recognized competition as the "single best way"to produce the most value within the defense industry (Department of Defense, 2014, p.14). Infact, in a survey by Avascent and FleishmanHillard (as cited in Barney and Breen, 2014) of executives

in the defense aerospace industry, 80% of those surveyed believed that the industry's competitive landscape was the driver of the industry globally. This paper, therefore, makes recommendations below that can make defense aerospace industries within India and Israel more competitive on a global scale, by encouraging the development of competitive environments domestically. These recommendations are made in the context of an increasingly protectionist and multipolar global environment.

India

Simplification of Equipment Lines & Procurement Process

For countries that import defense equipment on a large scale, it makes sense to procure equipment for specific "lines" from a single partner. For instance, they may procure most of their combat aircraft from one partner, most of their reconnaissance aircraft from another partner, and most of their Airborne Early Warning & Control (AEW&C) systems from yet another partner. This reduces the cost of procurement, as well as increases line efficiency, as economies of scale can be achieved with large orders and backup equipment can be made by the same partners. However, the IAF currently has a wide variety within lines, that creates inefficiencies in the supply chain (Kanwal & Kohli, 2018).

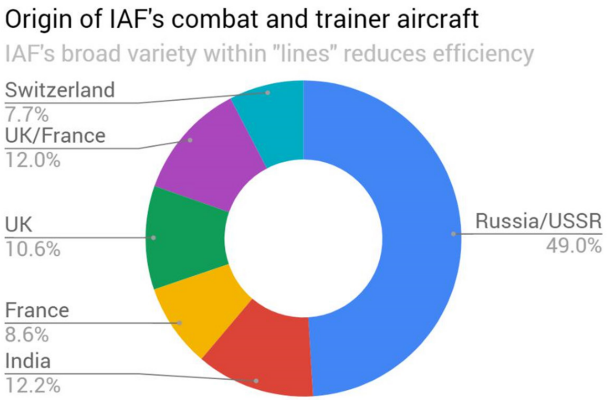

Figure 4. Origin of IAF's combat and trainer aircraft (Spetalnick, 2016).

A part of the reason for the existing complexity in lines is because of the notoriously bureaucratic process for defense procurement. Several simplifications can be made in the procurement process, that would allow faster procurement and make large-scale orders possible. This includes:

Increase in Capital Procurement Stage of Budgetary Allotment.

A larger chunk of the military's budget needs to be allocated towards capital procurement. Currently, revenue expenditures (such as salary payments to military personnel) form the largest chunk of defense expenditure. As the defense budget is increased every year, funds can gradually be increased for capital expenditure, in percentage terms. Additionally, India needs to follow through with long-pending defense reforms that would make the military a "leaner" force, increasing efficiency without expanding the size of the military, that would free up monetary resources to support increased capital expenditure.

Separation of Acquisition from Indigenization

The same committee under India's Ministry of Defense is responsible for defense acquisition and furthering indigenization plans. These two goals can conflict with each other, and therefore, half-hearted decisions have historically been taken on either front. Separate committees need to be set up to achieve each goal and create plans for procurement, and higher authorities can then decide on that procurement plan to choose for any given project.

This, in turn, will lead to line simplification, and make India a more attractive destination for defense corporations to do business in.

Promotion of Defense Manufacturing Through Tax Reform

While India has taken steps in the right direction to promote defense manufacturing, more needs to be done to ensure that investors see India as an attractive destination for defense manufacturing. One of the main areas in that India lags behind its competitors is in providing tax incentives for defense manufacturing.

A key step India needs to take in promoting defense manufacturing is tax reform in the sector. India can designate the defense aerospace industry as an "infrastructure sector" to facilitate tax breaks

and benefits to increase the availability of capital liquidity for such capital intensive ventures. Along with this, it should also create explicit tax breaks and benefits to promote indigenous development of defense aerospace components and subsystems. This will give a much-needed boost to India's domestic defense aerospace industry, in addition to attracting foreign companies to invest more in the sector.

Supporting the Involvement of the Private Sector

Supporting the involvement of the private sector is complementary to the other strategies recommended in this paper. Simplifying the defense procurement process and equipment lines will do well to encourage the private sector to enter the defense manufacturing industry. Additionally, we recommend an international outlook towards involving privatization. India needs to attract foreign companies in India with international agreements and provide capital incentives, such as easy access to local land for setting up industries and provide tax breaks and holidays. India has successfully implemented a similar strategy for its public sector company HAL (Kishore, 2016). HAL partnered with Sukhoi in 2007 to obtain licensing to be a coproducer for the 'Fifth Generation Fighter Jet Program', that produces the Sukhoi 300MKI used by the IAF.

India is currently moving towards this recommendation positively. The Indian Government facilitated a deal between Boeing and HAL in India to be producers in the F-18 Super Hornet program. For this deal, the government also included Mahindra Aircraft Systems, a private sector company, to produce certain aircraft parts for the F-18 Super Hornet. Pratyush Kumar, Boeing India President remarked on the deal that "This partnership brings the best of Indian public and private enterprises together in partnership with the world's largest aerospace company, Boeing, to accelerate a contemporary 21st-century ecosystem for aerospace & defense manufacturing in India"(ANI, 2018, pp.1).

Israel

Integration of Labor Laws

Israel's defense aerospace industry has been adversely affected by its non-uniform labor law, which stipulates different regulations for different types of enterprises within the same industry, which has created a non-competitive business environment in the defense aerospace industry (Sadeh, 2018). Employee unions are stronger within public sector companies, which means they can often dictate how the company makes business decisions. For instance, IAI has three civil divisions, including a Business Jets division, which posted a loss of $20 million in 2016 (Sadeh, 2018). In fact, IAI diverts money from its profitable defense divisions to its lossmaking civil divisions - largely because of the union's push to pursue civilian activity even when it became unprofitable. On the other hand, private sector companies have been free to focus on divisions that generate more profit, which in turn allows them to invest more heavily in research and development.

This does not mean that Israeli companies should look to crack down on unions, which can be beneficial in the long-term by lowering employee turnover and improving work conditions. However, Israel must integrate its labor law, treating public and private sector companies equally within the industry. This ensures a level playing field and allows companies to compete in a fair environment. This will foster healthy competition within the industry, resulting in higher levels of innovation as well as productivity.

Incentivizing the Involvement of the Private Sector by Enacting Transparency Measures

Even as the labor laws remain uneven, the private sector needs to bolster its role in defense aerospace manufacturing. Israel's defense aerospace manufacturing has been highly dominated by IAI. Israel needs to encourage its private manufacturers and small scale industries to diversify its defense aerospace manufacturing. Israel's defense protectionism should be used as an opportunity to develop a robust private defense manufacturing sector. This recommendation is specifically

intended to further strengthen Israel's already well-developed defense aerospace technologies (such as those in the UAS segment).

Elbit is a well-performing private company that has developed successful Israeli technology, namely in unmanned systems, and has inked deals with foreign militaries. In 2005, Elbeit signed a contract with the British company Thales to form UAV Tactical Systems Ltd., which produces intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) UAV Watchkeeper WK450 for the British Army. Elbit has also expanded into the U.S. through its company Elbit Systems of America (ESA) and is a manufacturing contractor for the F-16 and Bell Boeing V-22 helicopters (Army Technology).

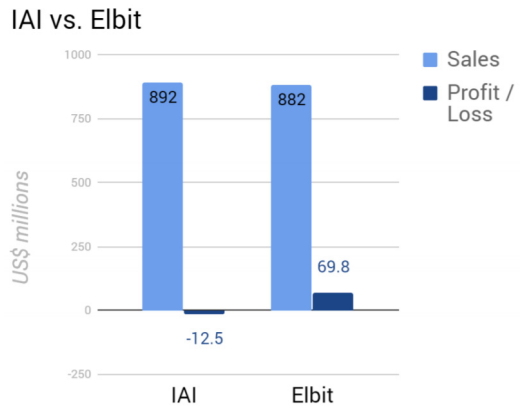

Figure 5. Elbit vs. IAI revenue and profit or loss (Egozi, 2019).

While private companies have expanded by creating global partnerships, their potential to influence the Israel Air Force has largely been untapped. They have also proven to be more efficient in meeting domestic as well as global demand, even as public sector companies have done well on average. For example, from the latest available comparative data (2018 Q3), Elbit's revenues were higher than IAI's, and it also made a profit while IAI posted a loss. This was despite IAI's significant lead in the market in terms of the total order backlog (Egozi, 2019). Elbit recently bought out Israeli Military Industries, a state-owned defense manufacturing firm, which underlines the growing strength of the private sector. Additionally, it also reaffirms the argument that private firms are more efficient in the industry, and incentivizing investment in this sector will both lead to higher efficiency and higher competition, which in turn will increase innovation in the industry.

Even as private sector firms seem to perform well, their participation in domestic aerospace defense manufacturing has been limited, partly due to opaqueness in the awarding of defense contracts, especially in the aerospace sector. Resultantly, an estimated 83% of Israel's capital budget on domestic defense aerospace purchases has been awarded to IAI, a public sector corporation (Egozi, 2019). Improving transparency is key to reviving the animal spirits of private sector enterprises to participate more effectively and create a more competitive industrial environment. Two key steps can be taken to achieve this:

Publication of Detailed Breakup of Defense Budget

It is a standard practice among most democratic nations to publish how the defense budget has been spent. Israel, however, is an exception. It needs to form either a special office under the Ministry of Defense (MoD) to publish its defense expenditure breakup or empower the Israel Central Bureau of Statistics (CBS) to publish these figures in its government expenditure reports. This is a low-cost and effective method to increase transparency while ensuring that the government adheres to standard international practices.

Formulation of Defense Aerospace Procurement Norms. No legislation dictates how aerospace defense procurement must be carried out, which adds to opaqueness in the process. Some defense purchases by the IsAF are also carried out without a clear justification of needs in the absence of procurement norms (Transparency International, 2013). Therefore, specific legislation needs to be enacted to set in place defense aerospace procurement norms, which is standard practice internationally, to improve transparency.

Transparency in defense procurement is widely acknowledged to improve competitiveness in the aerospace defense industry, and can, therefore, help the Israeli aerospace defense industry to grow (Parlo-Freeman, 2016).

Diversification of partnerships. Israel is highly dependent on the U.S. for its geopolitical support and military equipment. The geopolitical landscape has drastically changed in the world and multiple power centers have emerged in this multipolar world. Israel should look towards building more military partnerships and pacts with nations other than the U.S. Israel can look towards France, China, or Russia for diversifying its own Air Force equipment. Israel will have to be wary of political pressure from the U.S. if Israel looks towards China and Russia for its equipment. Israel's close alliance with the U.S. and its dependency on the U.S. for aid has restricted its relations with Russia and China. The U.S. administration has increasingly put pressure on Israel to restrict the sharing of information and technology with China. In a similar scenario, Turkey was expelled from the F-35 Joint Strike Fighter Program in July 2019 after Turkey has procured the S-400 Russian-made air defense system. While the S-400 systems are not a direct competition to the F-35, the U.S. is wary of Turkey allying with Russia as the S400 is a "Russian intellgence-collection platform that will be used to learn about its advancedcapabilities." (Marcus, 2019) Israel can also look for export and manufacturing partners. A likely partner for Israel is India. India's expansion and modernization efforts will help create a large market for Israel's equipment. Israeli produced IAI Searcher and IAI heron dominate India's unmanned missions. India also signed a $50 million contract with Israel Aerospace Limited for medium-range surface-to-air missile systems for the Indian Navy (PTI, 2019).

Conclusion

In a rapidly evolving multipolar world, countries and their corporations need to adapt quickly to survive, especially in highly internationalized industries, such as the defense aerospace industry. India and Israel - two regional powers and emerging players in this industry - face some common challenges when it comes to putting their defense aerospace industries on a high-growth trajectory. Consequently, they can learn from one another as well as work together to address these challenges. For instance, India has much to learn from the success of Israel's UAS sector. India's manufacturing in the defense aerospace sector is still plagued by the challenges of lack of productivity and limited foreign investment. These are challenges that Israel's UAS sector has successfully weathered, and it is, therefore, in a good position to support India's defense manufacturing while benefiting from its huge growth potential and strong domestic demand.

Both countries face the challenge of limited private sector involvement in their defense aerospace industries. They can work together in supporting the increased role of the private sector, which can bring higher levels of efficiency and competition, which is good for the industry as a whole.

In the aforementioned recommendations, it was discussed how Israel needs new defense partners to reduce its overdependence on the United States, while India needs to boost manufacturing in its defense aerospace industry. This presents an excellent opportunity for both countries to work together in this industry, which can be a win-win situation for both of them. India and Israel already enjoy favorable diplomatic and security relations. The promise of this relationship between their defense aerospace industries has not gone unnoticed by the governments of the two countries: They have recently been posturing towards developing this relationship, which has, in turn, sparked growth in investments in this industry between the two countries. However, to meet the full potential of this relationship, both countries need to move from mere posturing to concrete policy changes, some of which have been outlined in this paper. This is particularly important for spurring private sector involvement in this industry between the two countries.

Importantly, the case of India and Israel is not an isolated one; with the emergence of many regional powers in this multipolar world, countries should not be tempted by the growing trend of protectionism, which would restrict their defense aerospace industries. While all countries need to regulate the defense aerospace industry to some extent for national security reasons, they should open up their industries to other countries and

find favorable partners to do so. Nations can thereby take advantage of this multipolar world by developing new defense relationships with other countries, which will be mutually beneficial for everyone.

References

ANI. (2018). Make in India: Boeing announces partnership with HAL, Mahindra Defence. *Business Standard*. http://www.business-standard.com/article/news-ani/make-in-india-boeing-announces-partnership-with-hal-mahindra-defence-118041300151_1.html

Army Technology. Watchkeeper tactical UAV. *Army Technology*. https://www.army-technology.com/projects/watchkeeper/

Barney. J, & Breen. M. (2014). Rising tide: Game changing competition in the global aerospace & defense market. *Avascent*. https://www.avascent.com/news-insights/white-papers/rising-tide-game-changing-competition-global-aerospace-defense-market/

Bi. J. (2005). China's new concept for development. UNCTAD, China in a globalizing world. *New York and Geneva: United Nations*. https://unctad.org/en/Docs/gdsmdpb20051_en.pdf

Defense Industry Daily. (2019). Adir who? Israels F-35i stealth fighters. *Defense Industry Daily*. http://www.defenseindustrydaily.com/israel-plans-to-buy-over-100-f35s-02381/

Defense Update (2013). Israel - An unmanned air systems (UAS) super power. *Defense Update*. https://defense-update.com/20130503_israel-as-unmanned-air-systems-super-power.html

Defense World. (2019). HAL to complete 222 Su-30MKI manufacturing order by 2019-20. *Defense World*. http://www.defenseworld.net/news/16107/HAL_To_Complete_222_Su_30MKI_Manufacturing_Order_By_2019_20#.XUnFYehKhEY

Department of Defense. (2014). Performance of the defense acquisition system, 2014 annual report. *The United States Department of Defense*. http://dod.defense.gov/Portals/1/Documents/pubs/Performance-of-Defense-Acquisition-System-2014.pdf

Economic Times (2018). Make in India: Boeing & Tata announce JV to produce apache fuselages. *The Economic Times*. http://economictimes.indiatimes.com/news/defence/make-in-india-boeing-tata-announce-jv-to-produce-apache-fuselages/articleshow/49720444.cms

Egozi. A. (2019). Israel: Does Elbit's rise mean IAI's downfall?. *Breaking Defense, Above the Law*. Retrieved from https://breakingdefense.com/2018/12/israel-does-elbits-rise-mean-iais-downfall/

Government of India. Our strength: Indian air force: Government of India. *Indian Air Force, Government of India*. https://indianairforce.nic.in/content/our-strength

IANS. (2019). 4 Multi-Mission chinook helicopters inducted into IAF. *Gulf News*. https://gulfnews.com/world/asia/india/4-multi-mission-chinook-helicopters-inducted-into-iaf-1.62902061

Jayaraman. K. (2016). How India can speed up indigenisation in defence manufacturing. *Forbes India*. https://www.forbesindia.com/blog/enterprise/how-india-can-speed-up-indigenisation-in-defence-manufacturing/

Kanwal. G. & Kohli. N. (2018). Defence reforms: A national imperative. *Institute for Defence Studies and Analyses, New Delhi: Pentagon Press*. https://www.brookings.edu/wp-content/uploads/2018/04/book-defence-reform-3.pdf

Keval. S. (2019). Indian defence - brief overview on capital expenditure & spending patterns. *Alpha Invesco*. https://www.alphainvesco.com/blog/indian-defence-spending/

Kishore, J. (2016). How India can speed up indigenisation in defence manufacturing. *Forbes India*. https://www.forbesindia.com/blog/life/how-india-can-speed-up-indigenisation-in-defence-manufacturing/

Krishnan. R. & Sachitanand. R. (2019). What forced HAL onto a downward spiral and how it can overcome the turbulence. *The Economic Times*. https://economictimes.indiatimes.com/news/defence/what-forced-hal-onto-a-downward-spiral-and-how-it-can-overcome-the-turbulence/articleshow/67504460.cms

Marcus. J. (2019). US removes Turkey from F-35 fighter jet program. *BBC News*. https://www.bbc.com/news/world-us-canada-49023115

Mathews. N. (2019). HAL ramps up LCA production and looks to the Mk2. *Aviation International News*. https://www.ainonline.com/aviation-news/defense/2019-03-11/hal-ramps-lca-production-and-looks-mk2

Military and Aerospace Electronics. (2012). EFW acquires helmet-mounted display product line from Honeywell. *Military and Aerospace Electronics*. https://archive.is/20120714140528/http://prod.militaryaerospace.com/articles/2001/01/efw-acquires-helmet-mounted-display-product-line-from-honeywell.html

Mintner. T. (2019). Israel flirting with protectionist economic policies. *The Media Line*. http://themedialine.org/news/israel-flirting-with-protectionist-economic-policies

Perlo-Freeman. S. (2016). Transparency and accountability in military spending. *SIPRI*. https://www.sipri.org/commentary/topical-backgrounder/2016/transparency-and-accountability-military-spending

PricewaterhouseCoopers. (2018). Decoding the Indian aerospace and defence sector: Domestic and foreign investments and offset obligations. *PwC India*. http://www.pwc.in/assets/pdfs/industries/aerospace-and-defence-services.pdf

PTI. (2019). Israel inks USD 50 Mn deal with India to supply complementary naval MRSAM systems. *Business Today*. https://www.businesstoday.in/current/economy-politics/israel-inks-usd-50-mn-deal-with-india-to-supply-complementary-naval-mrsam-systems/story/365138.html

Research and Markets. (2019). Future of the Israeli defense industry - market attractiveness, Competitive landscape and forecasts to 2024. *Research and Markets Reports*. https://www.researchandmarkets.com/reports/4767164/future-of-the-israeli-defense-industry-market

Sadeh,S. (2018). How Israel aerospace went from sky high to free fall. *Haaretz*. http://www.haaretz.com/israel-news/business/how-israel-aerospace-went-from-sky-high-to-free-fall-1.5730498

Shukla. A. (2019). Lockheed inks memorandums of understanding with three Indian start-ups. *Business Standard*. https://www.business-standard.com/article/current-affairs/lockheed-inks-memorandums-of-understanding-with-three-indian-start-ups-119072000065_1.html

Singh. J. (2019). Defence manufacturing. *Invest India, National Investment Promotion & Facilitation*. http://www.investindia.gov.in/sector/defence-manufacturing

Spetalnick. M. (2016). U.S., Israel sign $38 billion military aid package. *Thomson Reuters*. http://www.reuters.com/article/us-usa-israel-statement/u-s-israel-sign-38-billion-military-aid-package-idUSKCN11K2CI

Stacey. D. (2016). 5 charts that show India's growing fighter jet shortage. *The Wall Street Journal*. http://blogs.wsj.com/briefly/2016/09/26/5-charts-that-show-indias-growing-fighter-jet-shortage/

Tian. N., Fleurant. A., Kuimova. A., Wezeman. P., & Wezeman. S. (2019). Trends in world military expenditure, 2018. *SIPRI*. http://sipri.org/sites/default/files/2019-04/fs_1904_milex_2018_0.pdf

TNN. (2019). LCA tejas good for exports, says HAL. *Times of India.* https://timesofindia.indiatimes.com/city/bengaluru/lca-tejas-good-for-exports-says-hal/articleshow/68102505.cms

Transparency International. (2013). Corruption perceptions index: Corruption around the world in 2013. *NEWS Press*. https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:59YX-N171-F12G-X25W-00000-00&context=1516831

UPI. (2013). Israel builds up its war robot industry. *UPI*. https://www.upi.com/Defense-News/2013/04/26/Israel-builds-up-its-war-robot-industry/54601367005342/?ur3=1

World Bank. (2011). Multipolarity: The new global economy. *The World Bank Group*. http://siteresources.worldbank.org/INTGDH/Resources/GDH_CompleteReport2011.pdf