Defence Equipment Industry: Achieving Self-Reliance and Promoting Exports

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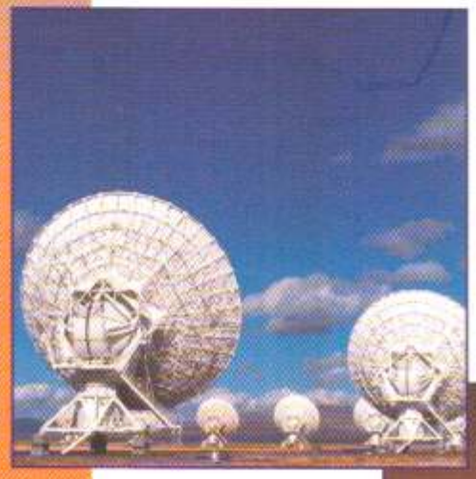

एक्ज़िम बैंक
EXIM BANK
भारतीय निर्यात-आयात बैंक
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WORKING PAPER NO. 52

DEFENCE EQUIPMENT INDUSTRY: ACHIEVING SELF-RELIANCE AND PROMOTING EXPORTS

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Executive Summary

The defence industry is technology driven and capital intensive. Like many other industries, the defence segment has also witnessed changing landscapes. For a long period of time, the defence sector had been shorn of globalization, with most governments investing in national defence companies. Although national governments still play a predominant role in the defence space, there has been a gradual emergence of transnational defence companies reflected in the consistent growth of Foreign Direct Investments (FDI) in this sector during the past decade.

GLOBAL SCENARIO

The concept of a single Original Equipment Manufacturer (OEM) operating at all stages of the value chain has become obsolete in the current global defence production, as it has in other sectors like automobiles. The global space and defence industry is now characterized by various supply chains. The importance of value chains in global defence production can be gauged by the fact that the manufacturing of UK Warrior Armoured Fighting Vehicle (AFV) required over 200 Tier I suppliers, while the manufacturing of German Leopard II Tank required about 1,500 supplying companies.

Global Arms Production and Military Expenditure

Global military expenditure declined for the third consecutive year in 2014 by (-) 0.4 percent, to amount to US$ 1776 bn (current prices and exchange rate). Military expenditure includes all current and capital expenditures on the armed forces, including peacekeeping forces; defence ministries and other government agencies engaged in defence projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities.

Expenditures in the regions of Africa, Asia, Eastern Europe and the Middle East continued to increase in 2014. Following the trend in the past years, military expenditures in the regions of North America and Western Europe declined during the year. During the period 2004-2014, the region of Africa has shown the maximum vibrancy in terms of military expenditure, registering a CAGR of 7.1 percent.

The USA had the largest share in top 100 arms producing and military services companies, with a share of 36.4 percent in 2014, followed by Russia at 16.1 percent. Companies from several countries have emerged as major arms producers over the last decade. While companies from Turkey, Brazil, Finland, Ukraine and Poland did not feature among the top hundred arms producers in 2002, they had a few companies among the top hundred in 2014.

High economic growth, high oil or gas revenues, and significant armed conflict or other violence have been often associated with high military spending. There is a positive correlation of 0.93 between the military expenditure of countries and their GDP, implying that high GDP is very often associated with a high military expenditure. However, correlation between military expenditure as percentage of GDP of countries with their GDP is extremely low (0.09), indicating that high GDP need not be associated with a greater share being allocated to military expenditures. Military expenditure as percentage of GDP in 2014 was the highest for Oman at 11.8 percent, followed by

Saudi Arabia (10.8 percent), South Sudan (8.2 percent), and UAE (5.7 percent).

The coefficient of variation (CV) measures the volatility of the data set around the mean – the greater the CV, the greater is the volatility. An analysis of five countries – the USA, China, South Korea, India and the UK shows that the CV is much higher in case of countries with centrally planned defence production (i.e. China and to a lesser extent India), while it is relatively lower for countries with more private production in this sector (i.e. the USA, South Korea and the UK).

During 2014-2018, global defence budget of the top 50 defence spenders is expected to increase by US$ 89 bn (CAGR: 1.4 percent) to reach the level of US$ 1690 bn. The global defence R&D budget is also expected to register a CAGR of 2.0 percent during 2014-18. In their pursuit of obtaining new defence capabilities and developing domestic capacities, China, Russia, India and the lower-income nations are expected to be among the largest contributors to the increase in global procurement budget.

International Arms Transfers: Major Weapons

For comparing international arms transfers, two major data sources have been considered in the study - SIPRI and UNCOMTRADE. SIPRI measures the 'volume', not the financial value, of arms transfers. UNCOMTRADE, on the other hand, measures the financial value of exports. A limitation with the data from SIPRI is that it does not include transfers of small arms, trucks, ammunition, support equipment, services or technology, and most light weapons and components. On the other hand, the data sourced from UNCOMTRADE does not include all defence items and is inclusive of some non-defence items too. In the current study, data sourced from SIPRI have been termed as trade in 'Major Weapons', while that sourced from UNCOMTRADE are termed 'Defence Equipment'.

Each weapon that falls within the SIPRI definition of major conventional arms is given a Trend Indicator Value (TIV). The TIV is based on the known unit production costs of a core set of weapons and is intended to represent the transfer of military resources rather than the financial value of the transfer.

The United States was the largest exporter of major weapons in 2014, accounting for 36.0 percent of the total arms exports, followed by Russia (21.1 percent), France (7.0 percent), the United Kingdom (6.0 percent) and Germany (4.2 percent). India was the 22nd largest exporter in 2014, with its exports recording a CAGR of 15.3 percent during the period 2009-2014.

India was the largest importer of major weapons in 2014, with a share of 15.0 percent, significantly up from 8.2 percent share in 2009, followed by Saudi Arabia (9.3 percent), Turkey (5.5 percent), China (4.8 percent) and Indonesia (4.2 percent).

Aircraft was the largest category of weapon system in global exports, accounting for 46.7 percent of the total exports in 2014, up from 40.7 percent in 2009. Other major weapon categories in 2014 were Ships (13.9 percent), Missiles (12.7 percent), Armoured Vehicles (9.0 percent), Sensors (5.7 percent), Engines (5.0 percent), and Air Defence Systems (4.6 percent).

International Arms Transfers: Defence Equipment

Global exports of defence equipment registered a consistent increase from 2011 onwards. Total value of exports in 2014 stood at US$ 219.1 bn, witnessing a y-o-y growth of 11.3 percent.

France was the largest exporter of defence equipment in the world, accounting for more than one-fourth of the total exports during 2014.

Germany (share of 20.2 percent), the United States (8.1 percent), the United Kingdom (7.7 percent) and Canada (6.0 percent) were the other top defence equipment exporters in 2014. India was the 7th largest exporter of defence equipment in the world, accounting for 3.1 percent of the global exports.

The United States was the largest importer of defence equipment, with its share in the global market increasing from 14.6 percent in 2010 to 18.0 percent in 2014. France (share of 13.5 percent), Germany (11.8 percent), China (5.9 percent), and the United Kingdom (4.3 percent) were the other major importers of defence equipment in the world. India was the tenth largest importer of defence equipment, accounting for nearly 1.7 percent of the global market.

In 2014, India was the 5th largest exporter of swords, cutlasses, bayonets, lances, scabbards and sheaths (HS: 9307) and also the 5th largest exporter of aircraft, (helicopter, aeroplanes) & spacecraft (satellites). India was also the second largest importer of aircraft launching gear; ground flying trainer (HS: 8805).

Global Foreign Investment Scenario in Defence Equipment

According to FDI Markets Database of the Financial Times, between January 2003 and June 2015, a total of 247 FDI projects were recorded in the global defence equipment sector. These projects represented a total capital investment of US$ 4.51 billion. Being a technology intensive industry, global defence manufacturers are wary of sharing and losing control of technology. Moreover, FDI in defence will be attractive only if the investments yield commensurate benefits in the recipient country and future orders are assured. Hence, investments in the global defence sector are limited.

North America was the largest recipient of FDI inflows during the period January 2003-June 2015, amounting to US$ 1332 mn, followed by Asia Pacific (US$ 1040 mn), Western Europe (US$ 944 mn) and Middle East (US$ 703 mn). On the other hand, Western Europe was the largest source country for FDI investments, with investments of US$ 2715 mn originating from this region.

Outlook

Governments across the globe are increasing their military expenditures to deal with terrorism and address issues pertaining to sovereign security. Cyber-security is also increasingly becoming a major area of defence spending. This is expected to create substantial opportunities for defence companies.

However, growth prospects for defence expenditure can be impacted by the slower economic growth in China. Moreover, while hostilities in Middle East countries are expected to keep the demand for defence equipment high, spending may be constrained on account of falling oil prices which has a major impact on the reserves of these countries. On the other hand, increase in budget of the United States Department of Defence is expected to provide a boost to global defence spending. Hence, the outlook for the industry is positive in the medium term.

INDIAN SCENARIO

India has a large defence industrial base consisting of research laboratories, defence public sector undertakings, ordnance factories and several private firms. However, these have been unable to meet the burgeoning requirements of the armed forces in the country, thereby making India one of the largest importers of defence equipment in the world.

Defence Spending in India

Defence budget can be categorized into revenue and capital expenditure. The revenue portion is incurred largely on pay and allowances, and operation and maintenance costs. The capital expenditure, on the other hand, is largely utilised for procurement of military equipment. The total defence budget of India increased by 10.9 percent in 2016-17, and witnessed a CAGR of 7.8 percent during the period 2011-12 to 2016-17. The increase in revenue expenditure has been sharper at 13.6 percent than the 6.1 percent increase in the capital expenditure during 2016-17. Notwithstanding this, the consistent increase in the capital expenditure is reflective of the modernization efforts in defence equipment.

The market size for defence equipment in 2014-15 is estimated to have been ₹ 81618.4 crore, registering a growth of 3.4 percent as compared to the previous period.

Defence Production in India

Defence Public Sector Units (DPSUs) and Ordnance Factories dominate the defence industrial base in India. Together, they account for nearly fifty percent of the domestic defence market. There are a total of nine DPSUs and 41 ordnance factories in the country. Several private Indian companies are also engaged in defence equipment production, but they cannot participate in certain sensitive projects. DPSUs and ordnance factories also source some of their requirements from the private sector. In recent times, there has been encouragement to private sector participation in the defence sector. Small and medium enterprises (SMEs) also play a crucial role in the defence production space of India. These account for nearly 17.5 percent of the domestic defence market. SMEs are a major supplier of components, sub-assemblies, capital goods, IT hardware, software, etc. to DPSUs and Ordnance factories.

India's defence model is at variance from the global one, with more than 80 percent value addition happening at the integrator stage. Component suppliers, many of which are SMEs, account for only the remaining 20 percent[1]. This concentrated model stunts the growth of the private players in the sector and also affects the scope for R&D.

Efficiency measured in terms of labour productivity stood at ₹ 724.7 cr (net profit per thousand employees) for the DPSUs (not including Goa Shipyard Ltd.). This is significantly higher than the labour productivity in sectors such as machinery. However, the efficiency lags behind sectors such as consumer goods (₹ 952.2 Cr) and transport equipment (₹ 861.4 Cr). The average labour productivity for domestic manufacturing as a whole was also higher at ₹ 746.0 Cr. As against this, labour productivity measured in terms of value added productivity per employee in UK aerospace and defence was nearly 8 percent higher than the productivity in all UK companies[2].

Defence Procurement in India

One of the key developments in the Indian defence sector over the last decade and a half has been the creation of the Defence Procurement Procedure (DPP). The DPP has evolved over the years witnessing various revisions and amendments, the most recent being DPP-2016. The underlying

[1]Defence Armoring India, Edelweiss Securities Limited
[2]Keith Hartley (2012), The Economics of Defence Policy: A New Perspective

objectives of the DPP are to essentially streamline the procurement process, make it structured and transparent and to build the capabilities of the Indian defence industry.

The share of foreign procurement in total defence procurements under both capital and revenue expenditure increased steadily from 19.7 percent in 2010-11 to 41.0 percent in 2013-14, before dipping to 37.1 percent in 2014-15. Total procurement registered a y-o-y decline of (-) 15.5 percent in 2014-15. Procurement from indigenous sources registered a lower decline of (-) 10.0 percent, as compared to a (-) 23.5 percent decline in procurement from foreign sources during the same year.

Defence Exports from DPSUs/ OFB

Defence exports by Defence Public Sector Undertakings/ Ordnance Factory Board from India have witnessed a fluctuating trend over the past few years. In 2013-14, the exports stood at ₹ 686.27 crore, which increased to ₹ 994.04 crore in 2014-15. During April-September 2015, the export value stood at ₹ 695.70 crore.

Trade Performance: Major Weapons

India's exports of arms have been rather moderate, with exports reaching their highest level in 2009. Some of the important recipients of arms from India include Ecuador, Maldives, Namibia, Nepal, Seychelles and Suriname. In 2014, exports of arms amounted to US$ 53 mn in terms of SIPRI TIVs at constant (1990) prices while cumulatively during 2009-2014, this figure amounted to US$ 96 mn. Over this period, Maldives, Namibia, Nepal, and Seychelles were the only countries with repeat purchases of major weapons from India.

Mauritius was the largest export destination for India's exports of major weapons cumulatively during 2009-2014, with a share of 42.7 percent. Other major export destinations were Ecuador (28.1 percent), Maldives and Seychelles (9.4 percent each).

In 2014, India's imports of major weapons as classified by SIPRI amounted to US$ 3487 mn in terms of SIPRI TIVs at constant (1990) prices. India's imports of major weapons registered a CAGR of 12.4 percent over the period 2009-2014. Russia was the largest import source, accounting for nearly 53.7 percent of the total imports in 2014, followed by the United States (32.7 percent) and Israel (4.4 percent). Even cumulatively, over the five year period 2009-2014, Russia was the largest source accounting for close to three-fourth of all the purchases of major weapons, followed by the United States (11.5 percent), the United Kingdom (3.7 percent), and Israel (3.5 percent).

India's arms exports are limited to aircraft, ships and armoured vehicles. In 2014, the exports were in the categories of ships and aircraft. It was for the first time in the past six years that ships featured as an export category from India. Within aircrafts, India's exports were predominantly in the helicopter segment.

Aircraft accounted for bulk of major weapons imports by India, with a share of 72.6 percent in India's total imports of these products during 2014, followed by missiles (9.2 percent) and engines (6.9 percent). In 2014, India's imports in all categories other than air defence systems, naval weapons and sensors registered a y-o-y decline.

Trade Performance: Defence Equipment

India remained a net exporter of defence equipment in all the years during the period 2010-2014, except in 2010 and 2012, when trade balance turned negative at US$ 274.4 mn and US$ 1172.2 mn, respectively.

Overall, India's exports increased from US$ 1659.7 mn in 2010 to US$ 6844.8 mn in 2014, recording an impressive CAGR of 42.5 percent. Imports increased at a relatively lower pace, from US$ 1934.2 mn to US$ 3674.5 mn, thereby registering a CAGR of 17.4 percent. During 2014, imports recorded a y-o-y decline of (-) 1.7 percent from US$ 3736.8 mn to US$ 3674.5 mn. On the other hand, exports during 2014 registered a robust y-o-y growth rate of 59.5 percent.

Cumulatively from 2010-2014, Sri Lanka was the largest export destination, accounting for 8.4 percent of the total exports of these products from India during the period, followed by the USA (6.1 percent), UAE (5.9 percent), Singapore (4.5 percent), and the UK (3.5 percent).

On the imports side, France was, by far, India's largest source for defence equipment accounting for a share of 27.6 percent in the country's cumulative imports of US$ 14020.3 mn during the period 2010-2014. Other major import sources during this period were the USA (23.9 percent), Germany (18.7 percent), Canada (5.3 percent) and Singapore (4.9 percent).

Aircraft parts were the largest category of exports, accounting for 20.9 percent of the total exports of defence equipment during 2014 and an even higher share of 48.9 percent cumulatively during 2010-2014. Aircraft, (helicopter, aeroplanes) & spacecraft (satellites) was another major export category with a share of 46.9 percent during 2010-2014. Other export categories had miniscule shares.

On the import front, aircraft, (helicopter, aeroplanes) & spacecraft (satellites); and aircraft parts were the top two categories, with their shares in India's total imports of defence equipment being 72.3 percent and 18.8 percent, respectively during 2010-2014.

Aircraft parts account for a major share of the global import demand for defence equipment. However, India's competitiveness in this category has declined over the period under consideration. Hence, exporters need to focus in augmenting capacities and enhancing technical capabilities under this segment.

Another major import category is that of aircraft (helicopter, aeroplanes) and spacecraft (satellites). Most of the major suppliers in this category are developed countries. However, Brazil has been able to tap the potential in this sector and best practices in this sector of Brazil can be suitably adapted in the Indian case to promote exports from this sector.

Foreign Direct Investment (FDI)

Recently, FDI limit of 26 percent in the defence sector has been raised to 49 percent under the automatic route and above 49 percent on a case-to-case basis under the approval route wherever it is likely to result in access to modern and state-of-the-art technology. Portfolio investment and investment by Foreign Venture Capital Investors have been allowed up to permitted automatic route level of 49 percent. In case of infusion of fresh foreign investment within the permitted automatic route level, resulting in change in the ownership pattern or transfer of stake by existing investor to new foreign investor, Government approval will be required.

During April 2000 to December 2015, a total of US$ 5.02 million of FDI inflows have been received in the defence industry. Moreover, as on 30.06.2015, a total of 34 foreign investment proposals were approved in the defence sector, including products in defence electronics.

However, in terms of foreign capital expenditure (capex), between January 2003 and January

2016, a total of 17 FDI projects were recorded in the space and defence industry of India. These projects represent a total capital investment of US$ 423.90 mn. Maximum capex of US$ 124.5 mn was from Sweden in 3 projects from 2 companies, followed by the UK (US$ 107.4 mn of capex from 3 projects by 2 companies). The United States had the maximum number of FDI projects in India at 6, accounting for US$ 80.8 mn of capex. The top investing companies were Saab AB and BAE Systems.

One outward investment in the defence sector has also been recorded. Mahindra & Mahindra in 2010 had set up a joint venture in Ras Al-Khaimah, United Arab Emirates. Mahindra Emirates Vehicle Armouring Fz LLC manufactures custom armoured vehicles for variety of applications. The company has experience in the fields of engineering, prototyping and manufacturing of armoured cars and other armoured vehicles.

Outlook

The 'Make in India' policy of the Government of India for indigenisation of defence programme is expected to reap benefits for the domestic defence industry. India being a major importer of defence equipment has immense scope for attracting investments in its defence sector. Steps taken for greater participation of private players in this sector also creates possibilities for setting up of more defence manufacturing facilities, forming of joint ventures and obtaining state-of-the-art technologies. The initiatives taken in electronics manufacturing will also be beneficial for the strategic electronics segment.

Hence, while the demand for defence equipment grows in this unique monopsony industry, the recent initiatives by the Government of India, which is the buyer as well as the regulator, is expected to encourage investments and domestic production.

ENHANCING DEFENCE EXPORTS: SELECT OPTIONS

Due to various reasons, including capacity constraints and inadequate technological capabilities, Indian defence equipment suppliers are unable to secure greater share in the global market. Development of a strong defence manufacturing sector has the potential to position India as an attractive source country for global defence imports. Given the cost advantages which the country offers, multinational firms can engage in sourcing of defence equipment and services from the country if industrial capabilities are matched to those of international standards.

Apart from benefits in the form of greater export revenues, a robust manufacturing base will ensure self-reliance, provide large scale employment, and encourage creation of IP and dual-use technologies. Appropriate policy oriented, manufacturing related and promotional strategies need to be adopted by this sector to emerge as a leading player in both domestic and export markets. As in the case of several successful global defence manufacturers, ECA support can also help create global suppliers in India's defence sector.

I. Policy Oriented Strategy

Revisions in Offset Policy

India has one of the highest threshold limits and the lowest offset percentage requirement, among some of the major defence equipment importers of the world. Moreover, according to Laxman Behra (2015), India also does not specify the exact way in which foreign vendors can discharge their offset obligations. As against this, Canada has a list of technologies on which vendors are required to

invest at least 5% of their offset obligations. Turkey uses offsets for promotion of exports by specifying the export requirements in the tender document itself. India also does not have an implementation agency for effective management of offsets and their monitoring. On the other hand, countries such as Canada have a dedicated, single-window agency to manage offsets in all aspects, ranging from vetting offset proposals, to awarding offset credits to vendors and monitoring them .

Hence, the offset policy needs to be amended to direct offset obligations in critical areas which can be identified by the Ministry of Defence. The offset percentage requirements also need to be revised upwards, while threshold limits need to be revised downwards.

Special Priority Status to Defence Sector

The defence sector can also be placed on par with the infrastructure sector to ensure that serious defence players are able to secure long term finance at competitive pricing. Infrastructure sector in India has been a focus area for the Indian Government and there exists a strong incentive system, which includes tax holiday of ten years. Such tax related incentives will be crucial for the growth of domestic defence industry.

Given the huge import dependence, the government could also consider according 'Deemed Export' status for the defence industry for a few years, extendable in future. 'Deemed Exports' refers to those transactions in which the goods supplied do not leave the country and the payment for such supplies is received either in Indian rupees or in free foreign exchange. Deemed exports are eligible for several benefits such as advance license, deemed export drawback and exemption/refund of terminal excise duty. Benefits of deemed export project could be extended to defence projects. Supplies of inputs and capital goods to defence projects, especially those awarded through international competitive bidding could be granted refund of terminal excise duty. Such benefits could also be made available to Indian offset partners.

Membership in Non-Proliferation Regimes

There exist several multilateral non-proliferation export control regimes to combat the problems related to proliferation and export of weapons of mass destruction (WMD). These regimes are wide-ranging and endeavour to tackle the threats to security. The regimes focus on specific threats such as chemical and biological weapons (The Australia Group), nuclear weapons (Nuclear Suppliers Group), delivery systems (Missile Technology Control Regime), and conventional arms (The Wassenaar Arrangement). India is not a member of any of these groupings.

As India increases its capacity to export defence equipment, which might be sensitive in nature, it will be essential for the country to be in conformity with the major international non-proliferation regimes. The country also needs to set up export control systems in order to strengthen its case for becoming a member in these groupings. In order to facilitate this, domestic industries should be encouraged to adopt global best practices in export control and regulations.

II. Manufacturing related strategy

R&D Expenditure in Defence Sector

R&D expenditure in defence has registered an increase over the past two years, reaching a level of ₹15,282 cr in 2014-15. This accounted for nearly 6.7 percent of the total defence expenditure during 2014-15. As against this, the budget for Research, Development, Test and Evaluation (RDT&E) programme of the US Department of Defense -

which supports the development of future military hardware - was about 11.3 percent of the defence budget in FY2015. In the case of China as well, approximately 16 percent to 18 percent of the defence budget is spent on R&D expenditures. Hence, there is a need for upward revisions in the defence R&D expenditures in the country. This will help in creation of Intellectual Property Rights within the Indian defence space, which in turn will help in increasing the competitiveness of the defence R&D resulting in state-of-art technologies and improvement in domestic defence production capabilities. This will also help Indian defence industry to tap overseas markets by production of innovative defence equipment.

R&D is usually divided into three main segments: basic research, applied research, and development. Basic research is research undertaken primarily to acquire new knowledge without taking into consideration the applicability of the results. On the other hand, applied research is directed towards a specific objective, and development is activity drawing on existing research results and directed specifically towards the creation of new and improved products and processes. For the defence sector to benefit from the research activities, applied research and development segments must receive a major share of the expenditure on R&D. Industrial applicability of research work needs to become a major focus area. Currently, nearly 70 percent of India's R&D investment is dedicated to advanced research, and development as against 80 percent and 92 percent, respectively, in the case of the US and China.

Technology Development

In India, technology transfers in defence space have not been satisfactory, leading to significant dependence on foreign manufacturers. The offset policy also does not put special emphasis on development of domestic technological capabilities. Moreover, several major defence exporters are wary of transferring technologies, thereby restricting India's access to new technologies by way of imports.

Under the current scenario, it will be essential to promote domestic technology development for self-reliance in domestic production. India has been successful in developing space and nuclear technologies, and an appropriate incentive system and innovation climate can nudge the defence sector on to a higher technological path.

DPSUs need to be encouraged to develop cluster of suppliers and incubate technology based companies. Handholding small suppliers and incentivizing innovation in high risk areas through a cost-plus contract structure will be essential for propelling the defence industry on a higher growth path.

The 2005 report of the Kelkar Committee on review of Defence Procurement Procedure had recommended several policies for enhancing self-reliance in the defence sector. Among other recommendations, two Technology Development Funds were recommended - the Strategic Defence Industry Fund which was 'a non-lapsable pool of resources', especially for the 'Make' projects; and the Defence Technology Product Development Fund which was meant for the SME sector for undertaking design and development projects. The non-lapsable nature of these resources was crucial for unhindered support to the domestic defence industry. However, these proposed funds never saw the light of the day. To achieve self sufficiency in the defence space, it may be worthwhile to reconsider these options.

Availability of Test Facilities

Private entities registered in India can avail of Government test facilities such as military ranges and laboratories for testing and evaluation purposes. Previously, private players sent their equipments abroad for testing purposes. While this is expected to drastically reduce the development cost of defence products, there is scope for creating a more enabling environment.

According to a report by ELCINA, the test labs available with government/private establishments do not have complete range of test facilities under one roof. This necessitates movement of equipment to labs in different parts of the country. Moreover, these labs have fixed charges for each test and firms testing their systems are required to pay the test charges in advance. In case the test does not comply with the test conditions, the test would be conducted again after necessary modifications and after another fee payment.

Creation of new test facilities will be important in order to meet the demands of the private players. Public-private partnerships in some categories of defence equipment can help in management of cost and quality of the labs. Formation of an industry group with a forum specific to testing facilities can help in productive dialogues between relevant stakeholders for technology advancements. Moreover, provisions can be made for providing fundamental test facilities for measurement of physical and electrical parameters at one place so that equipment need not be transferred to various locations. Subsidies on test fees can also be provided to smaller manufacturers of defence components.

Skill Development

The defence industry requires highly skilled labour force. However, the current education and training structure does not adequately meet the requirements, thereby compromising the defence innovation climate in the country. In 2008, the report of the Rama Rao Committee for restructuring of DRDO had noted that only ten percent of the scientific manpower in DRDO had higher qualification of PhD, and majority of the workforce was not research trained. Moreover, according to National Skill Development Council, the aerospace industry alone will require an additional manpower of over 185,500 by 2022 in its R&D, manufacturing, and maintenance, repair and overhaul (MRO) segments. Hence, it is essential to set up a dedicated Defence Technology University which could cater exclusively to the demands of the defence industry.

III. Promotional Suggestions

Dedicated Body for Exports Promotion

In several countries such as Australia and Turkey, there are dedicated government offices which facilitate the overseas sales of indigenous defence equipment through government channels. On similar lines, a dedicated export promotion council can be created under the Ministry of Defence. This dedicated council could follow ongoing overseas defence tenders and provide the information to relevant Indian companies. It can also set up liaison offices in strategic geographies. The council can also participate in international defence fairs, for displaying Indian capabilities in the defence sector.

Strategic Partnerships in Defence Space

Firms from the private sector can be identified and encouraged to develop and manufacture major defence equipment. This can be achieved through incentives like sharing of R&D expenses by the Government. It is noteworthy that a similar recommendation was made by the Kelkar

Committee (2005) in the form of "Raksha Udyog Ratna", but the plan was later scrapped by the Ministry of Defence.

The report of the committee of experts for amendment to DPP 2013 including formulation of policy framework, chaired by Mr. Dhirendra Singh has also suggested a strategic partnership model, under which a few big private players will be identified and nurtured through preferential treatment. These companies can be appointed for 'Buy and Make' and Government-to-Government procurement programmes. The strategic partnership model is yet to become a part of DPP-2016.

Australia's AIC program is similar to the proposed strategic partnership model, where in areas defined as 'Priority Industry Capabilities', long term contracts are assigned to a few vendors. Focused vendor landscape per critical area and long term nature of contracts help fuel long term investments in the identified areas and thereby build capacity.

Centralized Registration Process for Common Vendor Base

Various defence procurement agencies such as Director General of Ordnance Factories (DGOF), DPSU, DRDO and Directorate General of Ordnance Services (DGOS), have separate vendor-registration process, while the format for procurement is the same for all. Moreover, vendors registered with any of the departments of the Ministry of Defence can be considered for procurement by other departments. However, there exists no exhaustive vendor database. Devising a mechanism for centralized registration can help in creation of a single vendor database, which can be then used for dissemination of procurement related information. This will help enhance competitiveness through the procurement process, thereby increasing productivity.

IV. Promotion of Defence Exports through ECA Support

Defence exports of major exporting economies have generally been supported by the Export Credit Agencies (ECA) of respective countries. These ECAs are typically Government owned although their operations are largely independent. Like other ECAs, the Export-Import Bank of India (Exim Bank) has also been supporting exports of defence related products and equipment, including vessels and vehicles, and defence related services from India, under its various flagship financing programmes. As on September 30, 2015, 121 project exports contracts valued at ₹ 2918.1 Cr were in execution for defence equipments and services (exclusive of dual use items).

Japan uses its overseas development assistance for supporting exports from the defence sector. A fraction of defence exports are also routed through India's development assistance. Lines of Credit (LOCs) are one of Government of India's major instruments of development assistance. These LOCs are Government of India-backed and Exim Bank-managed credit lines. Under the LOC programme, exports of several defence equipment and services have been facilitated. As on September 30, 2015, exports of nearly ₹ 334.8 Crore was facilitated under the LOC program.

Exim-US, UKEF and EFIC provide export finance to the defence sector in the form of export credit and insurance. Exim Bank also has a wide range of products which have been used to support defence exports.

Exim Bank has played the role of a coordinator and facilitator for the promotion of project exports, besides that of a financier in extending export credits. Exim Bank is equipped to offer a comprehensive financing package to Indian project exporters including funded support, project

related guarantee facilities and issuance of letters of credit on their behalf towards third country imports for overseas projects. As on September 30, 2015, Exim Bank has financed various projects for defence equipment and services in different countries, valued at ₹ 2389.2 crore.

The Bank's strong emphasis on increasing project exports from India has been further enhanced with the introduction of the Buyer's Credit under NEIA Programme. The Indian project exporter, under this programme, is backed by a tailored financing package that meets the funding needs of the project, without impacting the balance sheet of the Indian project exporter. Consequently, while the Indian company remains responsible for timely and satisfactory execution of the project, it is free from commercial and political risks while executing the project.

BC-NEIA is extended by Exim Bank to the governments of recipient countries or to the parastatal project authorities backed by sovereign guarantee. NEIA, through ECGC, provides cover upto 100% for the facility (including interest) and also cover for exchange rate fluctuation till repayment of credit. As on September 30, 2015, one project valued ₹ 194.1 Crore for supply of vehicles and spares to Ministry of Home Affairs, Government of Republic of Tanzania is being executed with support under the BC-NEIA program.

The support offered by Exim Bank can at the best be considered moderate when compared to the kind of support being provided by other countries to promote their respective defence exports. A primary reason for this is that the ECAs of other countries have a strong financial backing from their respective governments while also not being subject to regulatory norms that are applicable for commercial banks. This is where the GOI could consider bolstering its support to Exim Bank in order to take the exports of Indian defence products to a higher trajectory while at the same time encouraging private sector participation in the entire process. Select mechanisms that the GOI could consider in this respect include the following:

- In addition to existing support under Lines of Credit and Buyer's Credit - NEIA, Exim Bank could be advised to devise a special program to finance defence project exports wherein interest equalisation support is provided to Exim Bank to offset the difference between the cost of Exim Bank's borrowings and the concessional interest rates offered under the scheme to partner developing countries. Such a mechanism could enable Indian companies to get new orders and increase their defence exports. Defence PSUs may also consider sub-contracting certain jobs to the private sector companies or partner with them (as may be deemed appropriate by GOI). This would enable PSUs to benefit from the skills available in the Indian private sector and also support GOI's 'Make in India' Programme.

- Exim Bank can also, with GOI support, finance strategic defence infrastructure overseas including ports / airbases, bridges and other associated infrastructure under its Lines of Credit programme. However, in order to provide a strategic thrust to such an initiative in the defence space would entail reviewing of existing regulatory norms.

    - For most ECAs across the world, profitability is not a major consideration. Exim Bank's charter requires it to be run on business principles with due regard to public interest. Exim Bank has been regularly paying dividends, and its dividend pay-out is one of the highest in the industry. Paradoxically, the higher the dividends

pay-out to the GOI, the greater the need for capital. Therefore, Exim Bank could be allowed to plough back its dividend that it is paying to the Government of India and utilise the proceeds exclusively for facilitating development of indigenous defence sector. Exim Bank could also be freed from the requirement of paying tax, with the proviso that the amounts equivalent to the tax load be earmarked for capacity building activities in the private defence sector.

- Moreover, defence transactions are usually large value transactions and in order to avoid growth limitations in the defence portfolio, Exim Bank must be adequately equipped with equity. It is to be noted that Exim Bank's authorised capital is ₹ 100 billion, which can be further enhanced by notification. Moreover, as on March 31, 2015, Exim Bank's paid-up capital amounted to ₹ 50.59 billion. Hence, there is enough head room for the paid-up capital to move up.

- The Export Development Fund (EDF) can also be utilized for promoting defence exports. In 1981 when Exim Bank was set up in terms of the Export-Import Bank of India Act, 1981 (Exim Bank Act), a provision was made in the Act for establishing an Export Development Fund. As per the Statement of Objects and Reasons in the Bill placed before the Parliament seeking setting up of the Export-Import Bank of India, "the Export Development Fund is to be utilized mainly for the purposes of research, training, survey, market intelligence etc. in connection with the country's international trade as well as for financing proposals which are unlikely to be supported by banks and financial institutions". The EDF can be used to support such transactions which are considered necessary by GOI as a matter of priority in the interests of the international trade of the country. Credits into this special fund can be made by way of loans, grants, donations or benefactions from GOI or any other sources in or outside India. Given the crucial role of capacity building in the defence sector in making the country self-reliant, financing and facilitating of defence exports can be routed through the EDF.

- A separate Defence Exports Fund (DEF) could also be created by the Government of India with contributions from a group of financial institutions, including Exim Bank. This fund can be a source of cheap finance for the defence sector. Strategic cooperation agreement can be signed by the group of financial institutions with the firms identified under the Strategic Partnership model. Defence projects supported through the DEF can be provided interest subvention by the Government of India. The Government of India can also launch a credit linked capital subsidy scheme through this fund for firms. Such cooperation between defence companies and banks exists in the countries of China and Brazil. There are close ties between China's state owned defence companies and banks. The BNDES in Brazil also had a significant role in the success of Embraer, as it not only provides the company with concessional loans, but is also an important shareholder in the company, through its wholly owned subsidiary.

- Exim Bank can also be appointed as a nodal agency for establishing and approving the eligibility of projects under the Defence Technology Product Development Fund recomended earlier in the study for design and development in the SME sector.

- The Cabinet Committee on Economic Affairs, at its meeting held on September 16, 2015, approved the proposal of the Department of Economic Affairs, Ministry of Finance, Government of India for a new concessional

financing scheme to enable Exim Bank to offer concessional finance to support Indian companies bidding for strategically important infrastructure projects overseas. Under this concessional financing scheme, Exim Bank will provide letter of support by way of Buyer's Credit for part financing a power project. The letter of support will enable Indian companies to participate in the tendering process for EPC contract of the projects under an International Competitive Bidding. Going forward, support can be granted to other strategically important projects such as development of airports, air-base, etc.

- The Cabinet Committee on Economic Affairs has approved the Interest Equalisation Scheme (earlier called Interest Subvention Scheme) on Pre and Post Shipment Rupee Export Credit with effect from 1st April, 2015 for five years. The scheme will be evaluated after three years. The rate of interest equalisation is 3 percent and is available to all exports of MSME and 416 tariff lines. While such initiatives are expected to reap benefits for merchandise exports, it is also essential to focus on other facets of exports, especially those which are capable of withstanding the pressure on the country's current account balance in the face of global slowdown. With industrial demand slowing down globally, governments around the world are now targeting project exports as vital conduits to exporting high-value machinery, labor, expertise, and technology. Hence, the Government may consider extending the scheme to project exports including defence projects.

  Currently, the BC-NEIA programme is envisaged as a commercial or quasi-commercial priced product, and there is high resistance to such pricing occasioned by Chinese competition and the concessional pricing under the LOC programme. Interest equalization support can enhance the attractiveness of the programme and enable the Indian exporters to canvas aggressively for overseas projects.

- RBI can consider extending a line from its foreign exchange reserves to Exim Bank at an interest rate equal to the average return earned by RBI on deployment of the reserves for long-term financing of export-oriented defence manufacturing, strategic acquisitions overseas, technology transfer, etc. The actual release may be in annual tranches. This will enable Exim Bank to provide long term Buyer's Credit and LOC to the defence sector, which are in alignment with the estimated cash flow streams from the assisted projects. This mechanism would not only reduce borrowing costs for Exim Bank but also allow it to extend larger quantum of finance to support large defence contracts. The use of foreign exchange reserves to finance overseas projects of national interest is being done by Exim China. In 2015, Export-Import Bank of China (EXIM) received US$ 30 bn from China's Central Bank to support the country's 'belt and road' economic plan.

1. Global Scenario

INTRODUCTION

The defence industry is technology driven and capital intensive. Like many other industries, the defence segment has also witnessed changing landscapes. For a long period of time, the defence sector had been shorn of globalization, with most governments investing in national defence companies. Although national governments still play a predominant role in the defence space, there has been a gradual emergence of transnational defence companies reflected in the consistent growth of Foreign Direct Investments (FDI) in this sector during the past decade.

There are four key domains of the defence industry: Maritime (Navy and Coast Guard), Land, Aerospace, and Electronics. Taking into consideration only the major weapons, the Stockholm International Peace Research Institute (SIPRI)[3] has defined 11 categories of weapons – aircraft, air defence systems, anti-submarine warfare weapons, armoured vehicles, artillery, engines, missiles, sensors, satellites, ships and other products (Box 1). Apart from these, there are other military equipment which are not covered by SIPRI, such as small arms and light weapons (SALW) other than portable guided missiles such as man-portable air defence systems (MANPADS) and guided anti-tank missiles. Trucks, artillery under 100-mm calibre, ammunition, support equipment and components (other than those mentioned above), repair and support services or technology transfers are also not included in the database.

GLOBAL SPACE AND DEFENCE INDUSTRIAL SUPPLY CHAIN

The concept of a single Original Equipment Manufacturer (OEM) operating at all stages of the value chain has become obsolete in the current global defence production, as it has in other sectors like automobiles. The global space and defence industry is now characterized by various supply chains. The inter-linkages between various contractors at different stages of the supply chain are complex and the production structure has been compared by Bitzinger (1994) to a 'bowl of spaghetti, where moving one strand sets the contents of the whole bowl in motion'[4]. Depending on the sector, the supply chains can differ. For instance, strategic electronics industry is expected to be more globalized than the rest. The importance of value chains in global defence production can be gauged by the fact that the manufacturing of UK Warrior Armoured Fighting Vehicle (AFV) required over 200 Tier I suppliers, while the manufacturing of German Leopard II Tank required about 1,500 supplying companies.

In general, lead system integrators form the top of the supply chains (Exhibit 1). These work with several lower tier suppliers, many of which are small and medium enterprises (SME). The subcontractors provide specialized knowledge, products and capacity, and are often

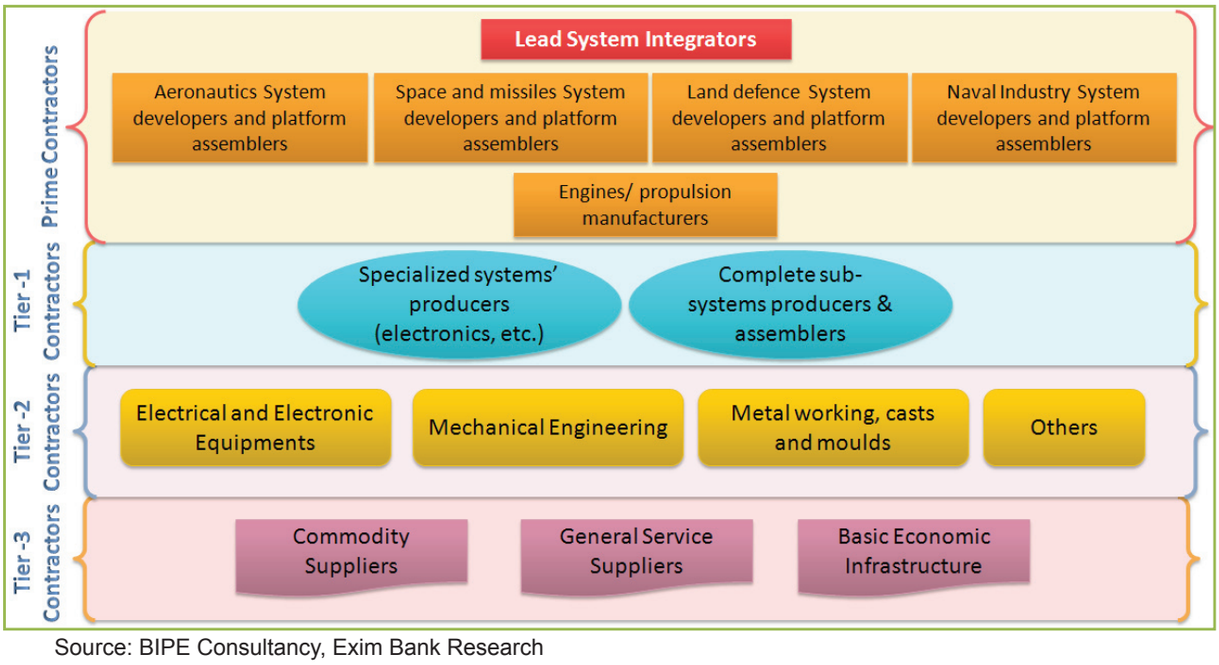
[3]SIPRI is an independent international institute dedicated to defence research and inter alia, provides data on global arms and armament.
[4]Bitzinger, R. A., 'The globalization of the arms industry: the next proliferation challenge', International Security, vol. 19, no. 2 (fall 1994), pp. 170–98.

Box 1: SIPRI's Classification of Major Conventional Weapons

- **Aircraft**: all fixed-wing aircraft and helicopters, including unmanned aircraft [unmanned aerial vehicle (UAV)/ unmanned combat aerial vehicle (UCAV)] with a minimum loaded weight of 20 kg. Exceptions are microlight aircraft, powered and unpowered gliders and target drones.
- **Air defence systems**: (a) all land-based surface-to-air missile (SAM) systems, and (b) all anti-aircraft guns with a calibre of more than 40 mm or with multiple barrels with a combined calibre of at least 70 mm. This includes self-propelled systems on armoured or unarmoured chassis.
- **Anti-submarine warfare weapons**: rocket launchers, multiple rocket launchers and mortars for use against submarines, with a calibre equal to or above 100 mm.
- **Armoured vehicles**: all vehicles with integral armour protection, including all types of tank, tank destroyer, armoured car, armoured personnel carrier, armoured support vehicle and infantry fighting vehicle. Vehicles with very light armour protection (such as trucks with an integral but lightly armoured cabin) are excluded.
- **Artillery**: naval, fixed, self-propelled and towed guns, howitzers, multiple rocket launchers and mortars, with a calibre equal to or above 100 mm.
- **Engines**: (a) engines for military aircraft, for example, combat-capable aircraft, larger military transport and support aircraft, including large helicopters; (b) engines for combat ships – fast attack craft, corvettes, frigates, destroyers, cruisers, aircraft carriers and submarines; (c) engines for most armoured vehicles – generally engines of more than 200 horsepower output.
- **Missiles**: (a) all powered, guided missiles and torpedoes, and (b) all unpowered but guided bombs and shells. This includes man-portable air defence systems (MANPADS) and portable guided anti-tank missiles. Unguided rockets, free-fall aerial munitions, anti-submarine rockets and target drones are excluded.
- **Sensors**: (a) all land-, aircraft- and ship-based active (radar) and passive (e.g. electro-optical) surveillance systems with a range of at least 25 kilometres, with the exception of navigation and weather radars, (b) all fire-control radars, with the exception of range-only radars, and (c) anti-submarine warfare and anti-ship sonar systems for ships and helicopters.
- **Satellites**: Reconnaissance satellites.
- **Ships**: (a) all ships with a standard tonnage of 100 tonnes or more, and (b) all ships armed with artillery of 100-mm calibre or more, torpedoes or guided missiles, and (c) all ships below 100 tonnes where the maximum speed (in kmh) multiplied with the full tonnage equals 3500 or more. Exceptions are most survey ships, tugs and some transport ships.
- **Others**: (a) all turrets for armoured vehicles fitted with a gun of at least 12.7 mm calibre or with guided anti-tank missiles, (b) all turrets for ships fitted with a gun of at least 57-mm calibre, and (c) all turrets for ships fitted with multiple guns with a combined calibre of at least 57 mm, and (d) air refuelling systems as used on tanker aircraft.

Source: SIPRI

Exhibit 1: Global Defence Industrial Supply Chain



Source: BIPE Consultancy, Exim Bank Research

technologically superior to the prime contractors. Specialization at various stages of the value chain requires the players to invest in research and development. According to Edelweiss Research, nearly 20 percent of value added in the global production model is by integrators, while the rest is by lower tiers. Tier I contractors perform majority of the contract.

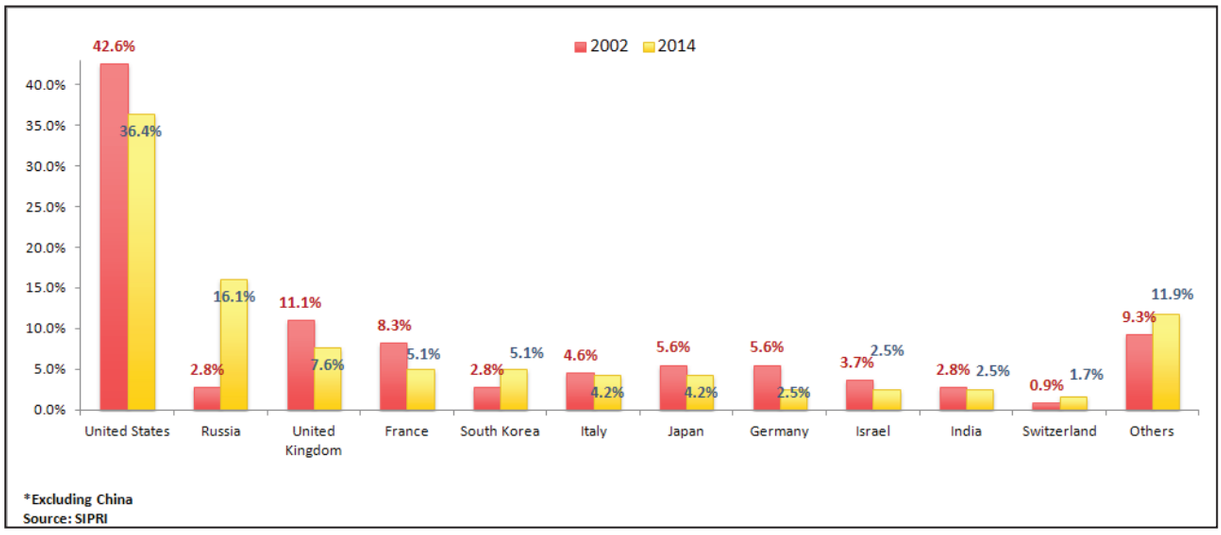
GLOBAL ARMS PRODUCTION AND MILITARY EXPENDITURE

The USA had the largest share in top 100 arms producing and military services companies, with a share of 36.4 percent in 2014, followed by Russia at 16.1 percent. The United Kingdom, which had the second largest share in 2002, witnessed a decline in share over the period under consideration, sliding to the third position in 2014 with a share of 7.6 percent (Exhibit 2). Companies from several countries have emerged as major arms producers over the last decade. While companies from Turkey, Brazil, Finland, Ukraine and Poland did not feature among the top hundred arms producers in 2002, they had a few companies among the top hundred in 2014. Three trans-European companies – CNH Industrial[5], Airbus Group, and MBDA were also among the top hundred producers in 2014.

All the companies in the top 10 were headquartered either in the USA or Western Europe. The share of these ten companies in the total arms sales of the Top 100 in 2014 was 49.6 percent, a marginal decline from 50.0 percent in 2013[6]. Lockheed Martin remained the topmost arms-producing and military services company in the world, with nearly 82 percent of the company's sales accruing from arms sales.

[5]The company is based in Italy but has production facilities in several countries. Hence, it is treated as a Trans-European company for statistical purposes.
[6]The SIPRI Top 100 Arms-Producing and Military Services Companies, 2014, SIPRI Fact Sheet, December 2015

Exhibit 2: Change in Share of Countries in Top 100 Arms Producing and Military Services Companies



There has been a continuous decline in arms sales for the US companies since 2011. According to SIPRI, the arms sales of companies have declined despite an easing of limits imposed on federal spending in 2014. As far as West European producers are concerned, the character is fragmented, and the defence industry in these countries is dependent on the national economic environment. In 2014, there was mixed performance in the region, with German companies registering significant increases in total arms sales, while companies based in France and the United Kingdom recording decline in arms sales.

The economies of Brazil, India, South Korea and Turkey accounted for 3.7 percent of total arms revenues in 2014, with 12 companies from these countries appearing in the top 100.

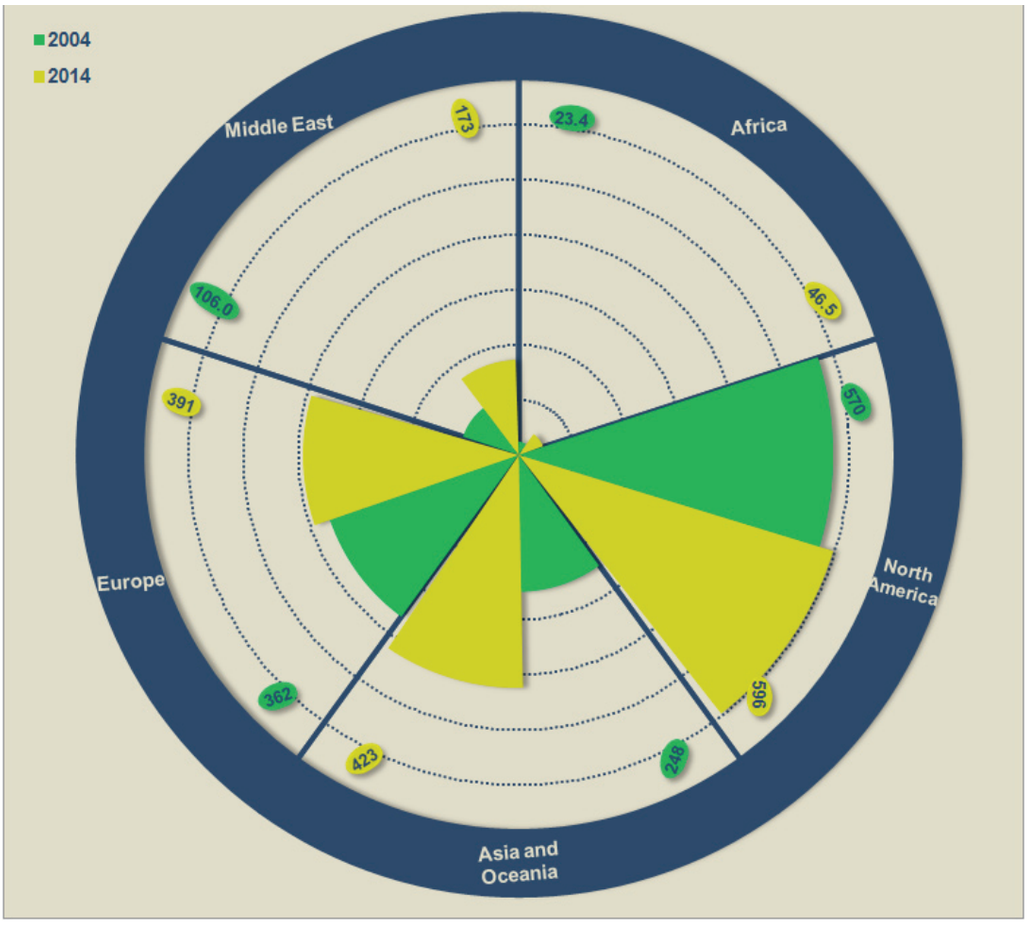
While Chinese companies are not covered under the SIPRI top 100 data, a study by Cheung (2013), provides some insights in this regard. Ten major state-owned conglomerates under which most of the Chinese arms industry are organized, had total sales of around 1608 billion yuan (US$ 268 billion) in 2012[7].

Global military expenditure declined for the third consecutive year in 2014 by (-) 0.4 percent, to amount to US$ 1776 bn (current prices and exchange rate). Military expenditure includes all current and capital expenditures on the armed forces, including peacekeeping forces; defence ministries and other government agencies engaged in defence projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities.

Expenditures in the regions of Africa, Asia, Eastern Europe and the Middle East continued to increase in 2014. Following the trend in the past years, military expenditures in the regions of North America and Western Europe declined during the year. During the period 2004-2014, the region of Africa has shown the maximum vibrancy in terms of military expenditure, registering a CAGR of 7.1 percent (Exhibit 3).

[7]Cheung, T. (ed.), The Chinese Defense Economy Takes Off: Sector-by-Sector Assessments and the Role of Military End Users (University of California Institute on Global Conflict and Cooperation: La Jolla, CA, 2013).

Exhibit 3: Region-wise Change in Military Expenditure



Figures are in US$ bn, at constant 2011 prices and exchange rates.
Source: SIPRI, Exim Bank Research

High economic growth, high oil or gas revenues, and significant armed conflict or other violence have been often associated with high military spending. There is a positive correlation of 0.93 between the military expenditure of countries and their GDP, implying that high GDP is very often associated with a high military expenditure. However, correlation between military expenditure as percentage of GDP of countries with their GDP is extremely low (0.09), indicating that high GDP need not be associated with a greater share being allocated to military expenditures. Military expenditure as percentage of GDP in 2014 was the highest for Oman at 11.8 percent, followed by Saudi Arabia (10.8 percent), South Sudan (8.2 percent), and UAE (5.7 percent).

The coefficient of variation (CV) measures the volatility of the data set around the mean – the greater the CV, the greater is the volatility. An analysis of five countries – the USA, China, South Korea, India and the UK shows that the CV is much higher in case of countries with centrally planned defence production (i.e. China and to a lesser extent India), while it is relatively lower for countries with more private production in this sector (i.e. the USA, South Korea and the UK) (Table 1).

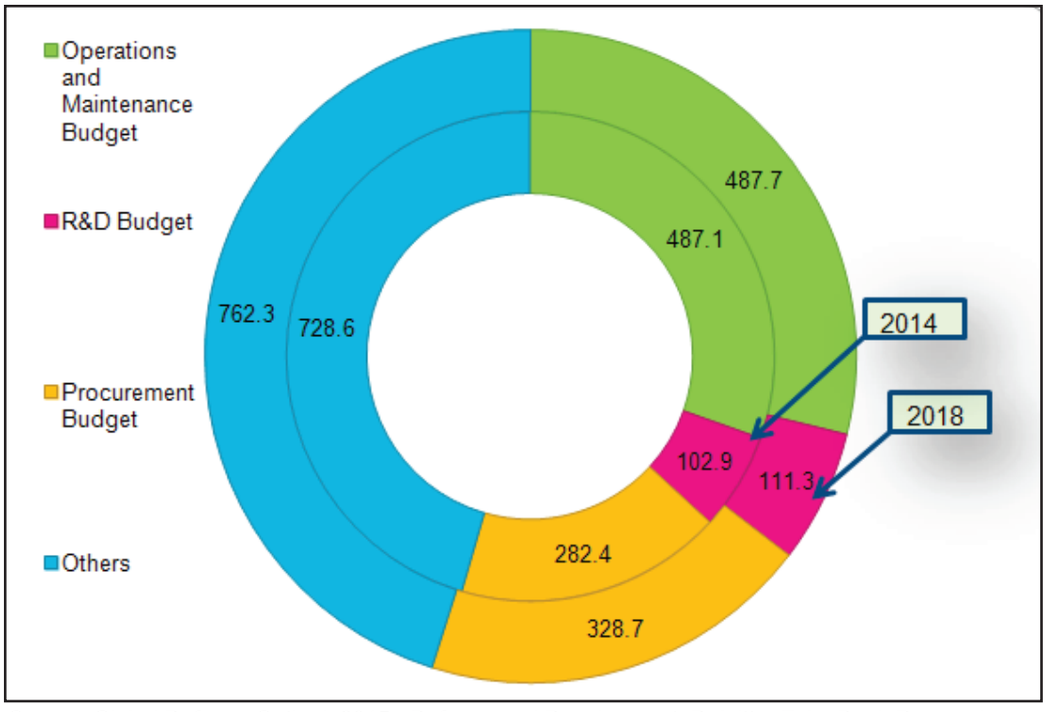
Table 1: Descriptive Statistics of Defence Expenditures of Countries (1988-2013; Constant (2011) US$ Mn)

	USA	China	South Korea	India	UK
Mean	522193.5	65107.9	22103.5	30166.5	55367.2
Standard Error	22009.0	9912.9	1113.8	2295.8	1081.5
Standard Deviation	112224.4	49564.7	5679.4	11706.5	5514.4
Range	341749.0	153045.0	17965.0	32851.0	17719.0
Minimum	378533.0	18336.0	14387.0	16783.0	46578.0
Maximum	720282.0	171381.0	32352.0	49634.0	64297.0
CV	21%	76%	26%	39%	10%

Source: SIPRI, EXIM Bank Research

During 2014-2018, total defence budget of the top 50 defence spenders is expected to increase by US$ 89 bn (CAGR: 1.4 percent) to reach the level of US$ 1690 bn (Exhibit 4). China is expected to witness the largest defence budget increase of nearly US$ 53 bn by 2018. On the other hand, defence budget of the United States is expected to decrease by US$ 36 bn during the same period.

Exhibit 4: Change in Defence Budget of the Top 50 Defence Spenders, 2014- 2018 (US$ Bn)



Source: Global Defence Outlook 2015 - Defence and Development, Deloitte, Exim Bank Research

Global defence procurement budget is expected to witness a healthy CAGR of 3.9 percent during 2014-2018. In their pursuit of obtaining new defence capabilities and developing domestic capacities, China, Russia, India and the lower-income nations are expected to be among the largest contributors to this increase in global procurement budget.

The global defence R&D budget is also expected to register a CAGR of 2.0 percent during 2014-18. According to an estimate, the United States is projected to account for nearly 58 percent of the global defence R&D budget in 2018. However, nearly 77 percent of the increase in global defence R&D budget will emanate from the countries of China, India and Russia[8].

INTERNATIONAL ARMS TRANSFERS: MAJOR WEAPONS[9]

For comparing international arms transfers, two major data sources have been considered in the study - SIPRI and UNCOMTRADE. SIPRI measures the 'volume', not the financial value, of arms transfers. UNCOMTRADE, on the other hand, measures the financial value of exports. A limitation with the data from SIPRI is that it does not include transfers of small arms, trucks, ammunition, support equipment, services or technology, and most light weapons and components. On the other hand, the data sourced from UNCOMTRADE does not include all defence items and is inclusive of some non-defence items too.In the current study, data sourced from SIPRI have been termed as trade in 'Major Weapons', while that sourced from UNCOMTRADE are termed 'Defence Equipment'.

Each weapon that falls within the SIPRI definition of major conventional arms is given a Trend Indicator value (TIV). The TIV is based on the known unit production costs of a core set of weapons and is intended to represent the transfer of military resources rather than the financial value of the transfer. Weapons for which a production cost is not known are compared with core weapons based on: size and performance characteristics (weight, speed, range and payload); type of electronics, loading or unloading arrangements, engine, tracks or wheels, armament and materials; and the year in which the weapon was produced. A weapon that has been in service in another armed force is given a value 40 per cent of that of a new weapon. A used weapon that has been significantly refurbished or modified by the supplier before delivery is given a value of 66 per cent of that of a new weapon (Box 2).

The United States was the largest exporter of major weapons in 2014, accounting for 36.0 percent of the total arms exports, followed by Russia (21.1 percent), France (7.0 percent), the United Kingdom (6.0 percent) and Germany (4.2 percent). The United States' exports during the period 2009-2014 registered a CAGR of 8.4 percent, thereby increasing its share in global exports by nearly 8 percentage points. The United Kingdom's exports also recorded a robust CAGR of 10.8 percent in the period under consideration. Exports of Germany and China, on the other hand witnessed CAGRs of (-) 14.0 percent and (-) 1.0 percent, respectively during the same period. India was the 22nd largest exporter in 2014, with its exports recording a CAGR of 15.3 percent during the period 2009-2014 (Table 2).

[8]Global Defence Outlook 2015 - Defence and Development, Deloitte

[9] SIPRI statistical data on arms transfers relates to actual deliveries of major conventional weapons. To permit comparison between the data on such deliveries of different weapons and to identify general trends, SIPRI has developed a system to measure the volume of international transfers of major conventional weapons using a common unit, the trend-indicator value (TIV). TIV figures do not represent sales prices for arms transfers. Nonetheless, they can be used for calculating trends in international arms transfers over periods of time, and global percentages for suppliers and recipients.

Box 2: Sample Calculations of the SIPRI Trend-Indicator Value

Transfer of newly produced complete weapons systems

In 2009, Germany delivered 6 Eurofighter combat aircraft to Austria. One Eurofighter is valued at 55 million SIPRI TIV. Therefore the delivery is valued at 330 million SIPRI TIV.

Transfer of surplus weapons

SIPRI values 'used' weapons at 40 percent of the TIV of a new weapon. In 2009, Germany delivered 43 surplus Leopard-2A4 tanks to Chile. One Leopard-2A4 tank is valued at 4 million SIPRI TIV and a used version is valued at 1.6 million SIPRI TIV (40 per cent of the value of a new version). Therefore, the delivery is valued at 68.8 million SIPRI TIV.

Transfer of significant components for major conventional weapons systems

In 2009, Germany delivered 8 MTU-8000 diesel engines for frigates to Singapore. One MTU-8000 diesel engine is valued at 4 million SIPRI TIV. Therefore the delivery is valued at 32 million SIPRI TIV.

Licensed production arrangement

The SIPRI definition of licensed production covers a range of activities whereby the recipient is granted permission to produce major conventional weapons from kits or blueprints. In 2009 the Republic of Korea was granted a license to produce one Type-209PN submarine. One Type-209PN submarine is valued at 275 million SIPRI TIV. Therefore the delivery is valued at 275 million SIPRI TIV.

Source: SIPRI Arms Transfers Database

Table 2: Top Exporters of Arms^

Rank	Top Exporters	Export TIVs*		CAGR (%)	Share (%)	
		2009	2014	(2009-2014)	2009	2014
1	The United States	6822	10194	8.4	28.1%	36.0%
2	Russia	5102	5971	3.2	21.0%	21.1%
3	France	1959	1978	0.2	8.1%	7.0%
4	The United Kingdom	1021	1704	10.8	4.2%	6.0%
5	Germany	2547	1200	-14.0	10.5%	4.2%
6	Spain	961	1110	2.9	4.0%	3.9%
7	China	1138	1083	-1.0	4.7%	3.8%
8	Israel	734	824	2.3	3.0%	2.9%
9	Italy	493	786	9.8	2.0%	2.8%
10	Ukraine	377	664	12.0	1.6%	2.3%
22	India	27	55	15.3	0.1%	0.2%
	World	**24286**	**25570**	**3.1**	**100.0%**	**100.0%**

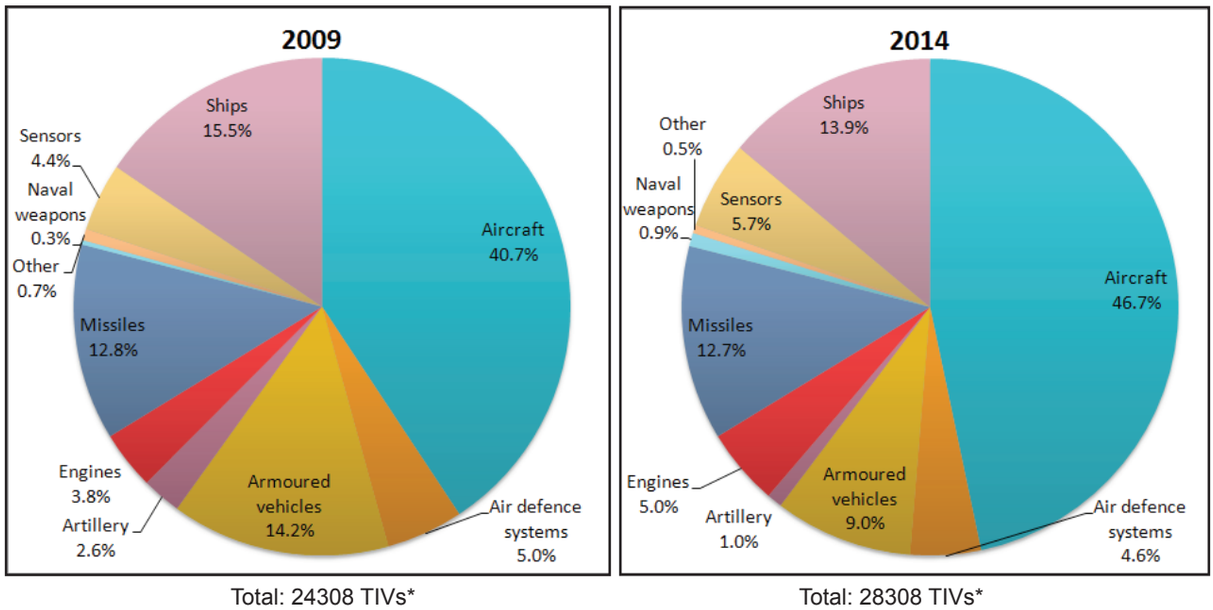
^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn. at constant (1990) prices.
Source: SIPRI

Table 3: Top Importers of Arms^

Rank	Top Importers	Import TIVs*		CAGR (%)	Share (%)	
		2009	2014	(2009-2014)	2009	2014
1	India	1986	4243	16.4	8.2%	15.0%
2	Saudi Arabia	756	2629	28.3	3.1%	9.3%
3	Turkey	733	1550	16.2	3.0%	5.5%
4	China	1407	1357	-0.7	5.8%	4.8%
5	Indonesia	437	1200	22.4	1.8%	4.2%
6	Viet Nam	61	1058	76.9	0.3%	3.7%
7	Taiwan	60	1039	76.9	0.2%	3.7%
8	UAE	560	1031	13.0	2.3%	3.6%
9	Australia	775	842	1.7	3.2%	3.0%
10	Oman	93	738	51.3	0.4%	2.6%
	World	**24308**	**28308**	**3.1**	**100.0%**	**100.0%**

^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn. at constant (1990) prices.
Source: SIPRI

Exhibit 5: Share of Weapon Categories in Global Exports



Total: 24308 TIVs* Total: 28308 TIVs*

* Figures are based on SIPRI Trend Indicator Values (TIVs) expressed in US$ mn. at constant (1990) prices.
Source: SIPRI

India was the largest importer of major weapons in 2014, with a share of 15.0 percent, significantly up from 8.2 percent share in 2009, followed by Saudi Arabia (9.3 percent), Turkey (5.5 percent), China (4.8 percent) and Indonesia (4.2 percent). India's imports during the period 2009-2014 registered a CAGR of 16.4 percent, thereby raising its share in global imports by nearly 7 percentage points. Imports by China witnessed negative CAGR of (-) 0.7 percent during this period (Table 3).

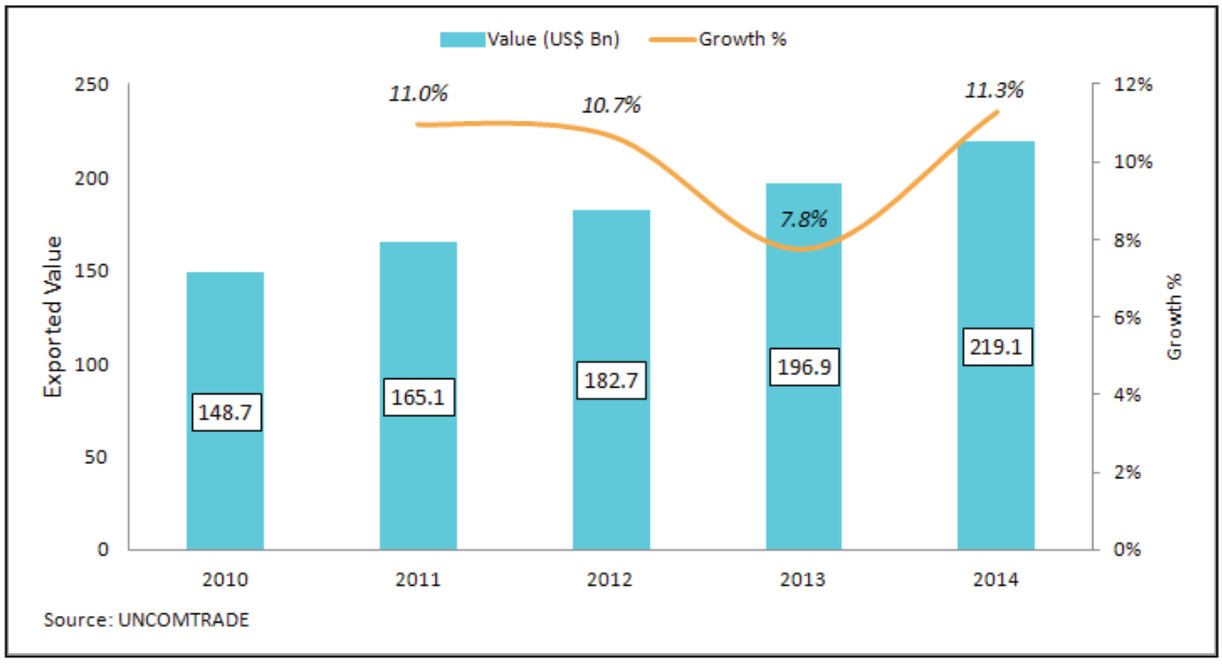
Aircraft was the largest category of weapon system in global exports of major weapons, accounting for 46.7 percent of the total exports in 2014, up from 40.7 percent in 2009. Other major weapon categories in 2014 were Ships (13.9 percent), Missiles (12.7 percent), Armoured Vehicles (9.0 percent), Sensors (5.7 percent), Engines (5.0 percent), and Air Defence Systems (4.6 percent) (Exhibit 5).

INTERNATIONAL ARMS TRANSFERS: DEFENCE EQUIPMENT[10]

Global exports of defence equipment registered a consistent increase from 2011 onwards. Total value of exports in 2014 stood at US$ 219.1 bn, witnessing a y-o-y growth of 11.3 percent (Exhibit 6).

France was the largest exporter of defence equipment in the world, accounting for more

Exhibit 6: Global Exports of Defence Equipment



[10]Data sourced from UNCOMTRADE for the following HS Codes: 890610 (Warships of all kinds); 8710 (Tanks and other armoured fighting vehicles, motorised, and parts); 8801 (Balloons, dirigibles, gliders, hang gliders); 8802 (Aircraft, (helicopter, aeroplanes) & spacecraft (satellites)); 8803 (Aircraft parts); 8804 (Parachutes and parts and accessories thereof); 8805 (Aircraft launching gear; ground flying trainer); 9301 (Military weapons, other than revolvers, pistols & arms of heading number 9307); 9302 (Revolvers and pistols, other than those of heading number 9303 or 9304); 9303 (Other firearm & similar devices operating by the firing of an explosive charge); 9304 (Arm nes, excluding those of heading no 9307); 9305 (Arm parts and accessories (of heading 9301 to 9304)); 9306 (Bombs, grenades, ammunitions & parts); and 9307 (Swords, cutlasses, bayonets, lances, scabbards & sheaths). As on 15th February 2016, nearly 97.43 percent of the global merchandise trade data for 2014 was published by UNCOMTRADE.

than one-fourth of the total exports during 2014. Exports of defence equipment from the country witnessed a CAGR of 5.4 percent during 2010-2014. Germany (share of 20.2 percent), the United States (8.1 percent), the United Kingdom (7.7 percent) and Canada (6.0 percent) were the other top defence equipment exporters in 2014. India was the 7th largest exporter of defence equipment in the world, accounting for 3.1 percent of the global exports. India's exports have registered strong CAGR of 42.5 percent during 2010-2014 (Table 4).

The United States was the largest importer of defence equipment, with its share in the global market increasing from 14.6 percent in 2010 to 18.0 percent in 2014. France (share of 13.5 percent), Germany (11.8 percent), China (5.9 percent), and the United Kingdom (4.3 percent) were the other major importers of defence equipment in the world. India was the tenth largest importer of defence equipment, accounting for nearly 1.7 percent of the global market. Its imports have witnessed a CAGR of 17.4 percent during 2010-2014 (Table 5).

The USA was the largest exporter and importer in several segments of defence equipment. In 2014, India was the 5th largest exporter of swords, cutlasses, bayonets, lances, scabbards and sheaths (HS: 9307) and also the 5th largest exporter of aircraft, (helicopter, aeroplanes) & spacecraft (satellites). India was also the second largest importer of aircraft launching gear; ground flying trainer (HS: 8805) (Table 6).

Table 4: Top Exporters of Defence Equipment

Rank	Top Exporters	Value of Exports (US$ mn)		CAGR (%)	Share (%)	
		2010	2014	(2010-2014)	2010	2014
1	France	46762.6	57798.2	5.4	31.4%	26.4%
2	Germany	30817.8	44199.5	9.4	20.7%	20.2%
3	The United States	12742.5	17837.9	8.8	8.6%	8.1%
4	The United Kingdom	174.7	16820.2	213.2	0.1%	7.7%
5	Canada	10600.4	13115.1	5.5	7.1%	6.0%
6	Italy	5587.6	7001.3	5.8	3.8%	3.2%
7	India	1659.7	6844.8	42.5	1.1%	3.1%
8	Singapore	4635.8	5848.5	6.0	3.1%	2.7%
9	Japan	2700.0	5675.2	20.4	1.8%	2.6%
10	Spain	3706.9	5497.5	10.4	2.5%	2.5%
	World	**148723.7**	**219120.9**	**10.2**	**100.0%**	**100.0%**

Source: UNCOMTRADE

Table 5: Top Importers of Defence Equipment

Rank	Top Importers	Value of Imports (US$ mn)		CAGR (%)	Share (%)	
		2010	2014	(2010-2014)	2010	2014
1	The United States	21656.4	39339.7	16.1	14.6%	18.0%
2	France	20130.1	29600.5	10.1	13.5%	13.5%
3	Germany	18533.6	25819.4	8.6	12.5%	11.8%
4	China	7621.3	13012.3	14.3	5.1%	5.9%
5	The United Kingdom	6838.7	9484.7	8.5	4.6%	4.3%
6	UAE	4557.5	8757.3	17.7	3.1%	4.0%
7	Saudi Arabia	3354.9	5249.6	11.8	2.3%	2.4%
8	Japan	2434.5	4138.4	14.2	1.6%	1.9%
9	Rep. of Korea	2541.7	3896.8	11.3	1.7%	1.8%
10	India	1934.2	3674.5	17.4	1.3%	1.7%
	World	**148723.7**	**219120.9**	**10.2**	**100.0%**	**100.0%**

Source: UNCOMTRADE, Exim Bank Research

Table 6: Segment-wise Top Exporters and Importers in the World (2014)

HS Code	Description	Top Exporters	Value (US$ Mn)	Share %	Top Importers	Value (US$ Mn)	Share %
9307	**Swords, cutlasses, bayonets, lances, scabbards & sheaths**	**World**	**75.0**		**World**	**75.0**	
		Qatar	24.4	32.5%	The USA	16.4	21.9%
		China	11.0	14.6%	France	15.2	20.3%
		Germany	10.0	13.3%	Germany	7.2	9.6%
		The USA	6.1	8.2%	Sweden	4.7	6.3%
		India	4.9	6.5%	UAE	3.6	4.9%
890610	**Warships of all kinds**	**World**	**506.4**		**World**	**506.4**	
		The USA	297.2	58.7%	Egypt	257.2	50.8%
		The Netherlands	76.4	15.1%	Peru	69.1	13.6%
		Ukraine	52.8	10.4%	China	52.8	10.4%
		Romania	47.7	9.4%	Norway	45.5	9.0%
		Rep. of Korea	31.9	6.3%	Colombia	31.9	6.3%

HS Code	Description	Top Exporters	Value (US$ Mn)	Share %	Top Importers	Value (US$ Mn)	Share %
8710	Tanks and other armoured fighting vehicles, motorised, and parts	**World**	**2208.3**		**World**	**2208.3**	
		The USA	875.3	39.6%	Saudi Arabia	453.3	20.5%
		Canada	444.5	20.1%	Sweden	192.7	8.7%
		Finland	240.8	10.9%	France	167.2	7.6%
		Cote d'Ivoire	160.4	7.3%	Germany	145.7	6.6%
		Switzerland	137.3	6.2%	The USA	141.7	6.4%
8801	Balloons, dirigibles, gliders, hang gliders	**World**	**47.2**		**World**	**47.2**	
		Germany	8.1	17.2%	The USA	6.8	14.4%
		The USA	5.2	11.0%	Germany	4.6	9.7%
		Israel	5.2	10.9%	Italy	4.4	9.3%
		Japan	4.4	9.3%	Australia	3.3	7.1%
		Czech Rep.	3.6	7.7%	Switzerland	2.9	6.2%
8802	Aircraft, (helicopter, aeroplanes) & spacecraft (satellites)	**World**	**123369.6**		**World**	**123369.6**	
		France	49798.6	40.4%	The USA	17092.6	13.9%
		Germany	33866.3	27.5%	Germany	16126.3	13.1%
		Canada	8148.2	6.6%	France	14115.7	11.4%
		The USA	5894.5	4.8%	China	10244.7	8.3%
		India	5247.8	4.3%	UAE	7078.7	5.7%
8803	Aircraft parts	**World**	**80823.7**		**World**	**80823.7**	
		The UK	13340.2	16.5%	The USA	19862.9	24.6%
		Germany	9674.8	12.0%	France	14921.8	18.5%
		France	7820.7	9.7%	Germany	9032.5	11.2%
		The USA	5819.8	7.2%	The UK	4304.4	5.3%
		Singapore	5571.3	6.9%	China	2585.9	3.2%
8804	Parachutes and parts and accessories thereof	**World**	**279.4**		**World**	**279.4**	
		The USA	60.9	21.8%	France	29.4	10.5%
		The UK	49.7	17.8%	The USA	29.0	10.4%
		France	21.2	7.6%	Germany	27.3	9.8%
		Viet Nam	20.7	7.4%	The UK	17.0	6.1%
		Germany	20.4	7.3%	Switzerland	9.7	3.5%
8805	Aircraft launching gear; ground flying trainer	**World**	**1482.8**		**World**	**1482.8**	
		Canada	604.9	40.8%	The USA	244.4	16.5%
		The USA	334.8	22.6%	**India**	139.9	9.4%
		The Netherlands	95.4	6.4%	China	114.1	7.7%
		Switzerland	70.8	4.8%	UAE	92.6	6.2%
		Germany	66.9	4.5%	Saudi Arabia	86.6	5.8%

HS Code	Description	Top Exporters	Value (US$ Mn)	Share %	Top Importers	Value (US$ Mn)	Share %
9301	Military weapons, other than revolvers, pistols & arms of heading no 9307	**World**	**726.8**		**World**	**726.8**	
		The USA	474.0	65.2%	Indonesia	77.4	10.7%
		Switzerland	84.8	11.7%	Saudi Arabia	68.6	9.4%
		Rep. of Korea	78.1	10.7%	The Netherlands	58.4	8.0%
		Poland	19.2	2.6%	Philippines	48.7	6.7%
		Turkey	11.9	1.6%	Israel	48.3	6.6%
9302	Revolvers and pistols, other than those of heading no 9303 or 9304	**World**	**504.9**		**World**	**504.9**	
		Germany	116.1	23.0%	The USA	241.5	47.8%
		The USA	105.5	20.9%	Canada	30.5	6.0%
		Croatia	93.2	18.5%	Egypt	26.8	5.3%
		Italy	84.4	16.7%	Saudi Arabia	17.5	3.5%
		Czech Rep.	48.7	9.6%	Thailand	13.1	2.6%
9303	Other firearm & similar devices operating by the firing of an explosive charge	**World**	**1366.9**		**World**	**1366.9**	
		Italy	339.7	24.8%	The USA	490.3	35.9%
		The USA	198.0	14.5%	Canada	139.9	10.2%
		Turkey	141.5	10.3%	France	61.2	4.5%
		Brazil	127.2	9.3%	The UK	59.1	4.3%
		Germany	107.1	7.8%	Russia	49.5	3.6%
9304	Arm nes, excluding those of heading no 9307	**World**	**591.1**		**World**	**591.1**	
		Czech Rep.	175.4	29.7%	The USA	128.5	21.7%
		China	112.4	19.0%	France	34.9	5.9%
		Germany	64.7	11.0%	Germany	28.8	4.9%
		The USA	63.3	10.7%	Canada	23.2	3.9%
		Spain	45.4	7.7%	The UK	23.0	3.9%
9305	Arm parts and accessories (of heading 9301 to 9304)	**World**	**1351.8**		**World**	**1351.8**	
		The USA	376.8	27.9%	The USA	413.7	30.6%
		Italy	111.1	8.2%	Viet Nam	93.7	6.9%
		Russia	109.0	8.1%	Germany	68.4	5.1%
		Germany	85.4	6.3%	The UK	66.7	4.9%
		Norway	70.8	5.2%	Canada	60.1	4.4%
9306	Bombs, grenades, ammunitions & parts	**World**	**5787.0**		**World**	**5787.0**	
		The USA	3326.5	57.5%	The USA	661.4	11.4%
		Rep. of Korea	319.5	5.5%	Saudi Arabia	639.6	11.1%
		Norway	210.3	3.6%	Other Asia, nes	533.9	9.2%
		Italy	193.7	3.3%	UAE	358.5	6.2%
		Brazil	182.6	3.2%	Japan	290.9	5.0%

Source: UNCOMTRADE, Exim Bank Research

GLOBAL FOREIGN INVESTMENT SCENARIO IN THE SPACE AND DEFENCE SECTOR

According to FDI Markets Database of the Financial Times, between January 2003 and June 2015, a total of 247 FDI projects were recorded in the global space and defence sector. These projects represented a total capital investment of US$ 4.51 billion. This data differs from official data on FDI flows as company can raise capital locally, phase their investment over a period of time, and can channel their investment through different countries for tax efficiency. Being a technology intensive industry, global defence manufacturers are wary of sharing and losing control of technology. Moreover, FDI in defence will be attractive only if the investments yield commensurate benefits in the recipient country and future orders are assured. Hence, investments in the global space and defence sector are limited.

The largest FDI investment was witnessed in the year 2008 with total global capital investment amounting to US$ 609.8 million. After the decline in global FDI investment in 2012, there has been consistent improvement in global FDI flows in this sector in the two subsequent years. From January-June 2015, capital investment of US$ 285.8 mn was recorded in the industry globally (Exhibit 7).

North America was the largest recipient of FDI inflows during the period January 2003-June 2015, amounting to US$ 1332 mn, followed by Asia Pacific (US$ 1040 mn), Western Europe (US$ 944 mn) and Middle East (US$ 703 mn). On the other hand, Western Europe was the largest source country for FDI investments, with investments of US$ 2715 mn originating from this region, followed by North America (US$ 1352 mn) (Table 7).

Exhibit 7: Global Foreign Direct Investments in the Space and Defence Industry

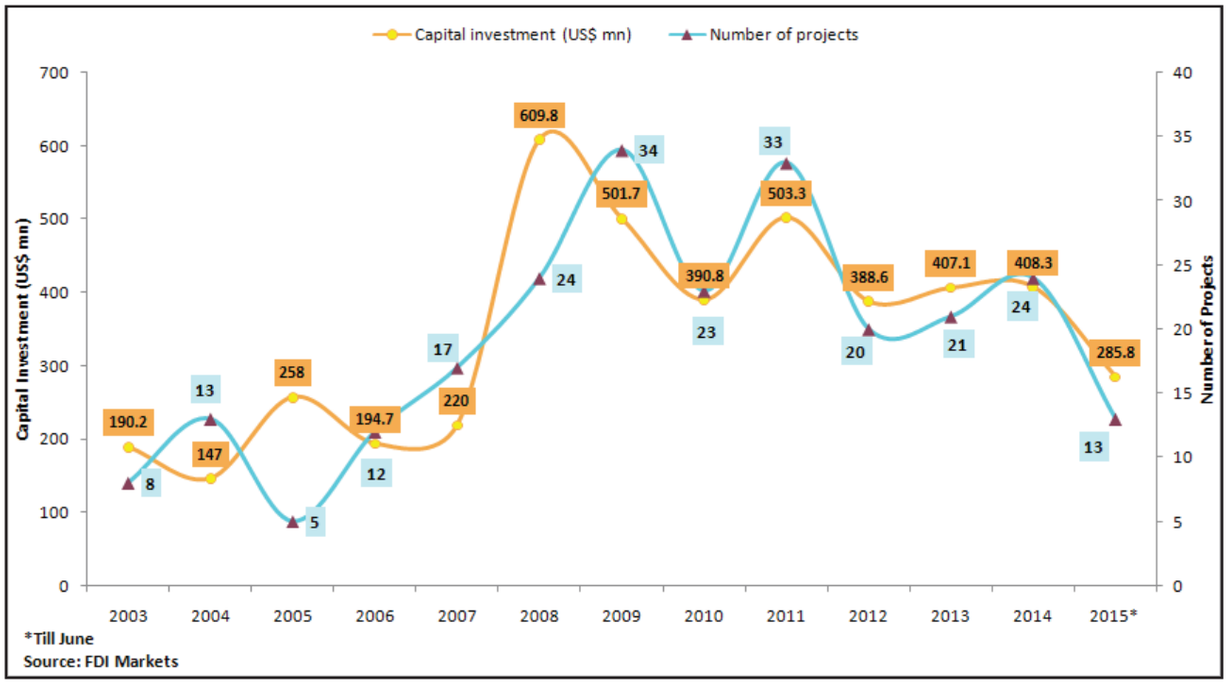


Table 7: FDI Trends by Regions in the Global Space and Defence Sector
(Values in US$ mn; Jan'03-Jun'15)

World Regions	FDI Outflows	FDI Inflows
Western Europe	2,715	944
North America	1,352	1332
Middle East	186	703
Rest of Europe	128	126
Asia-Pacific	99	1040
Africa	26	162
Latin America & Caribbean	-	200
Total	**4,505**	**4,505**

Source: FDI Markets

OUTLOOK

Governments across the globe are increasing their military expenditures to deal with terrorism and address issues pertaining to sovereign security. Cyber-security is also increasingly becoming a major area of defence spending. This is expected to create substantial opportunities for defence companies.

However, growth prospects for defence expenditure can be impacted by the slower economic growth in China. Moreover, while hostilities in Middle East countries are expected to keep the demand for defence equipment high, spending may be constrained on account of falling oil prices which has a major impact on the reserves of these countries. On the other hand, increase in budget of the United States Department of Defence is expected to provide a boost to global defence spending. Hence, the outlook for the industry is positive in medium term.

2. INDIAN SCENARIO

INTRODUCTION

India has a large defence industrial base consisting of research laboratories, defence public sector undertakings (DPSUs), ordnance factories and several private firms. However, these have been unable to meet the burgeoning requirements of the armed forces in the country, thereby making India one of the largest importers of defence equipment in the world. Like the global defence industry, the Indian defence industry has also witnessed changing courses over the years.

Behera (2013) identifies several different phases of India's defence industry, beginning with the adoption of the British Physicist P.M.S. Blackett's self-sufficiency model to a model of co-production and private sector participation[11]. India's defence manufacturing in the years after independence was in accordance with the Industrial Policy Resolution (IPR) of 1948 which explicitly stated that "the State must play an active role in development of industries." Even after the subsequent revision of IPR in 1956, arms and ammunitions remained under the purview of the public sector. The model being pursued by the government was a self-sufficiency model advised by P.M.S Blackett, focusing on low end technology and minimal dependence on State fund. Working on the self-sufficiency model, India's defence production grew significantly till the mid - 1960s. However, there were also certain weaknesses. During these initial years, the navy received low priority, largely due to greater land and air related threats to the country. Moreover, the focus was largely on the low- end systems and R&D was not considered a priority in this sector. The defence allocation, which is crucial for the development of basic industrial infrastructure, was also low. Further, indigenous content in several domestic production programmes was low.

In the 1960s, India's defence production model shifted from self-sufficiency to self-reliance. The country received military assistance from several countries, including the US. The erstwhile Soviet Union was an important source of such assistance at favourable terms. Several new ordnance factory and DPSUs like MIDHANI (Mishra Dhatu Nigam Limited) and BEML (formerly Bharat Earth Movers Limited) were established during this period, and the DRDO (Defence Research and Development Organisation) laboratories were expanded. There was a move towards licensed production of arms and armaments. However, such system of obtaining licenses for weapon assembly did not lead to any increase in the capability to design or develop advanced defence manufacturing techniques. Another major weakness in this model was the overdependence on the former Soviet Union.

The overdependence on imports from Soviet Union constricted the defence research and development base in India. Therefore, from the 1980s, the Government encouraged R&D through investment in DRDO. The Integrated Guided Missile Development Program and the Light Combat Aircraft project were crucial moves towards indigenous production in this phase. The next model adopted was one of co-production through partnership with foreign companies which

[11]L.K. Behera (2013), Indian Defence Industry: Issues of Self Reliance, IDSA Monograph Series, No. 21 July 2013

began in 1998 with the joint production of BrahMos (a short range supersonic cruise missile that can be launched from submarines, ships, aircraft or land) by India and Russia. Since then, India has undertaken several co-production projects. The Government also took a phenomenal step in recent times and liberalized the industry by opening it up to the private sector in 2001 and allowing for FDI up to 26 percent, and subsequently up to 49 percent.

DEFENCE SPENDING IN INDIA

Defence budget can be categorized into revenue and capital expenditure. The revenue portion is incurred largely on pay and allowances, and operation and maintenance costs. The capital expenditure, on the other hand, is largely utilised for procurement of military equipment. The share of total defence budget in the Central Government expenditure has remained in the range of 12.6 percent - 13.1 percent during 2011-12 to 2016-17. At the same time, the share of capital expenditure in the defence budget of the country has been in the range of 34.7 percent - 39.7 percent. Defence capital expenditure recorded an increase of 3.5 percent during 2014-15. However, it registered a y-o-y decline of (-) 0.6 percent in 2015-16. According to the budget estimates, it is expected to increase by 6.1 percent during the current year.

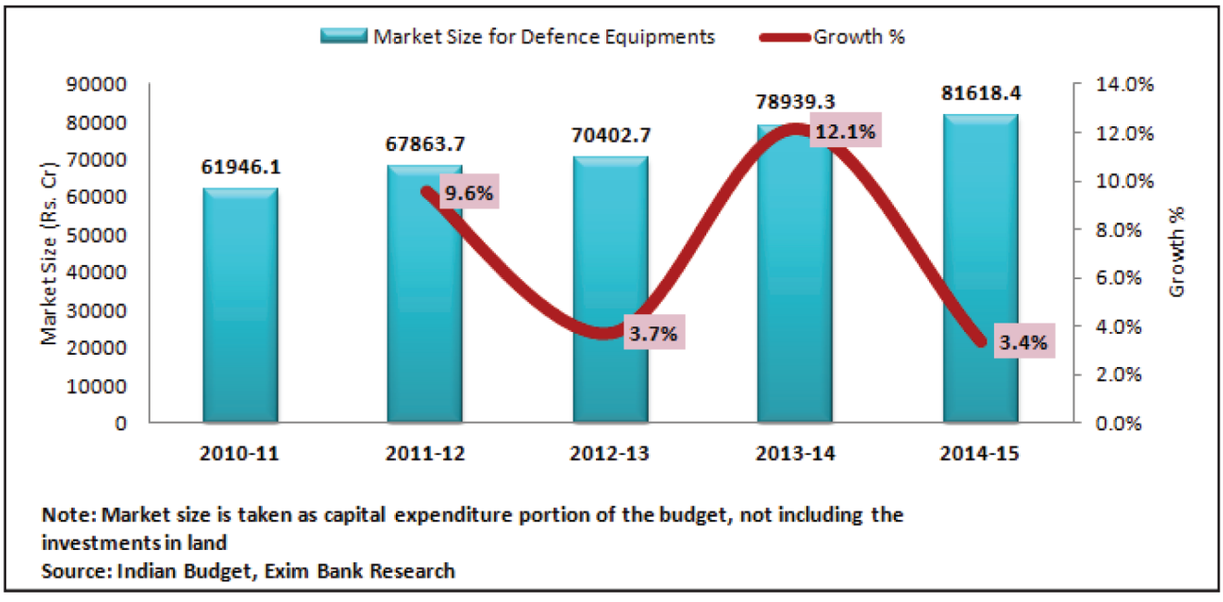
The total defence budget of India increased by 10.9 percent in 2016-17, and witnessed a CAGR of 7.8 percent during the period 2011-12 to 2016-17. The increase in revenue expenditure has been sharper at 13.6 percent than the 6.1 percent increase in the capital expenditure during 2016-17 (Table 8). Notwithstanding this, the consistent increase in the capital expenditure is reflective of the modernization efforts in defence equipment.

Table 8: Key Indicators of India's Defence Services Budget

Indicators	2011-12	2012-13	2013-14	2014-15	2015-16 (RE)	2016-17 (BE)
Defence Budget (₹ in Crore)	170913	181776	203499	218694	224636	249099
Growth of Defence Budget (%)	10.9%	6.4%	12.0%	7.5%	2.7%	10.9%
Revenue Expenditure (₹ in Crore)	103011	111277	124374	136807	143236	162759
Growth of Revenue Expenditure (%)	11.9%	8.0%	11.8%	10.0%	4.7%	13.6%
Share of Revenue Expenditure in Defence Budget (%)	60.3%	61.2%	61.1%	62.6%	63.8%	65.3%
Capital Expenditure (₹ in Crore)	67902	70499	79125	81887	81400	86340
Growth of Capital Expenditure (%)	9.4%	3.8%	12.2%	3.5%	-0.6%	6.1%
Share of Capital Expenditure in Defence Budget (%)	39.7%	38.8%	38.9%	37.4%	36.2%	34.7%
Share of Defence Budget in GDP (Constant Prices 2011-12 Series) (%)	2.0%	2.0%	2.1%	2.1%	2.1%	-
Share of Defence Budget in Central Government Expenditure (%)	13.1%	12.9%	13.0%	13.1%	12.6%	12.6%

RE- Revised Estimate; BE-Budget Estimate
Source: Ministry of Finance, Government of India; Office of the Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Exim Bank Research

Exhibit 8: Market Size for Defence Equipment (₹ Cr)



Note: Market size is taken as capital expenditure portion of the budget, not including the investments in land
Source: Indian Budget, Exim Bank Research

Until the announcement of the Union Budget 2016-17, the Ministry of Defence's total resource allocation were classified under six heads, with demand for capital outlay on defence services catering to the expenditure incurred on building or acquiring durable assets. Since the defence equipment market is largely a monopsony, the capital outlay on defence services, exclusive of expenditure on land, can be taken as a proxy for the market size of defence equipment and services in India. Based on this assumption, the market size for defence equipment in 2014-15 is estimated to have been ₹ 81618.4 Crore, registering a growth of 3.4 percent as compared to the previous period (Exhibit 8).

Capital outlay on defence services can be sub-divided into various heads. The category of 'other equipment', which largely includes guns/ tanks Boyevaya Mashina Pekhotys (BMPs) and connected stores, radars and air defence systems, various signal equipment, equipment for engineers, equipment for the Directorate General Armed Forces Medical Services, and equipment for new raisings of defence divisions, account for a considerable share of the capital expenditure. The share of capital expenditure on other equipment in total capital expenditure witnessed a significant increase to 26.4 percent in the budget of 2014-15, as compared to 22.9 percent in the previous year. Aircraft and aero engine accounts for the largest share in defence capital expenditure. In 2014-15, there was a decline of 26.4 percent in the capital expenditure under this head, leading to a decline in share of this segment from 48.1 percent in 2013-14 to 34.2 percent in 2014-15. From 2012-13 onwards, there has been an increase in the share of R&D capital allocation, with its share in the budget of 2014-15 being as high as 9.1 percent as against 6.6 percent in 2012-13 (Table 9).

Table 9: Capital Outlay on Defence Services (Values in ₹ Crore)

Major Heads	2010-11	2011-12	2012-13	2013-14	2014-15
Land	109.9	38.7	96.4	185.8	268.6
Construction	5874.8	5721.3	5658.9	5699.3	6806.4
Aircraft and Aero Engine	19343.3	26215.2	27575.2	38025.1	27971.1
Heavy and Medium Vehicles	1938.4	2358.6	1862.2	1389.4	1352.7
Other Equipment	17205.4	16330.6	16830.0	18115.2	21645.5
Naval Fleet	10620.0	10320.6	11074.3	8151	13355.4
Naval Dockyard	719.7	648.0	751.9	633.4	635.5
Ordnance Factories	454.2	278.5	349.1	465.3	746.2
Research and Development	4965.1	4616.3	4644.4	5241.5	7482.5
Other Capex	825.2	1374.7	1656.8	1219.1	1623.1
TOTAL	**62056.0**	**67902.4**	**70499.1**	**79125.1**	**81887**

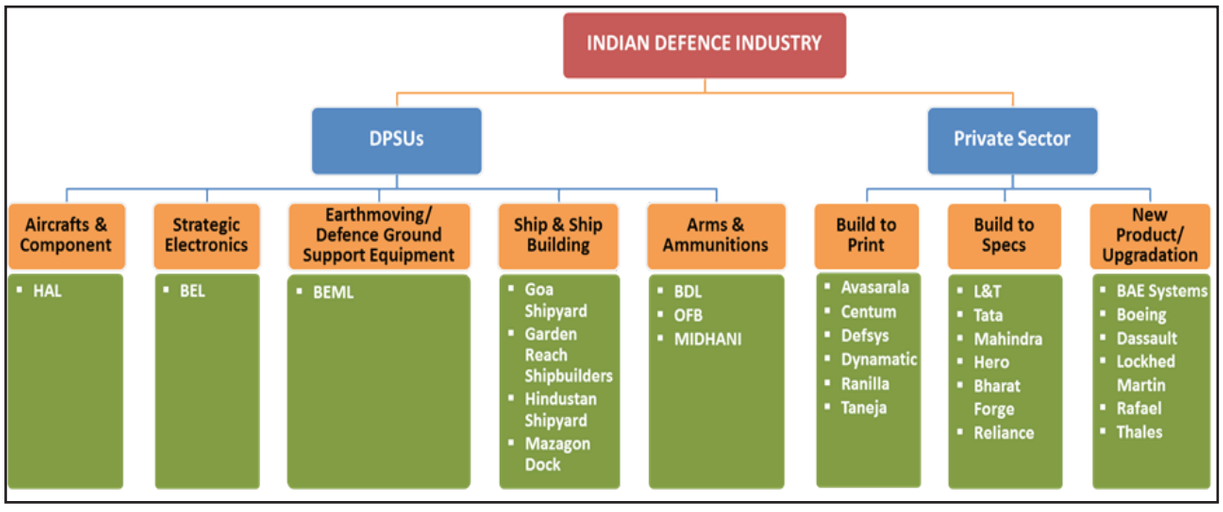
Source: Ministry of Finance, Government of India, Exim Bank Research

DEFENCE PRODUCTION IN INDIA

The Indian defence industry can be broadly divided into the DPSUs and the private sector. The DPSUs operate in five broad areas of aircrafts and component, strategic electronics, earthmoving/ defence ground support equipment, ship and ship building, and arms and ammunitions. There are several companies engaged in the ship and ship building sector, namely Goa Shipyard, Garden Reach Shipbuilders, Hindustan Shipyard, and Mazagaon Dock. Bharat Dynamics Limited, Ordnance Factory Board, and Mishra Dhatu Nigam Limited are the major Government agencies engaged in arms and ammunitions production (Exhibit 9). The Ordnance Factories are a giant industrial set up whose origin dates back to the pre-colonial times. The organization has a vast product range with around 1000 principal items. Apart from arms and ammunitions, the ordnance factories also produce troop comfort items, opto electronics, and other items such as special aluminium alloys for aviation and space industry, field cables, etc.

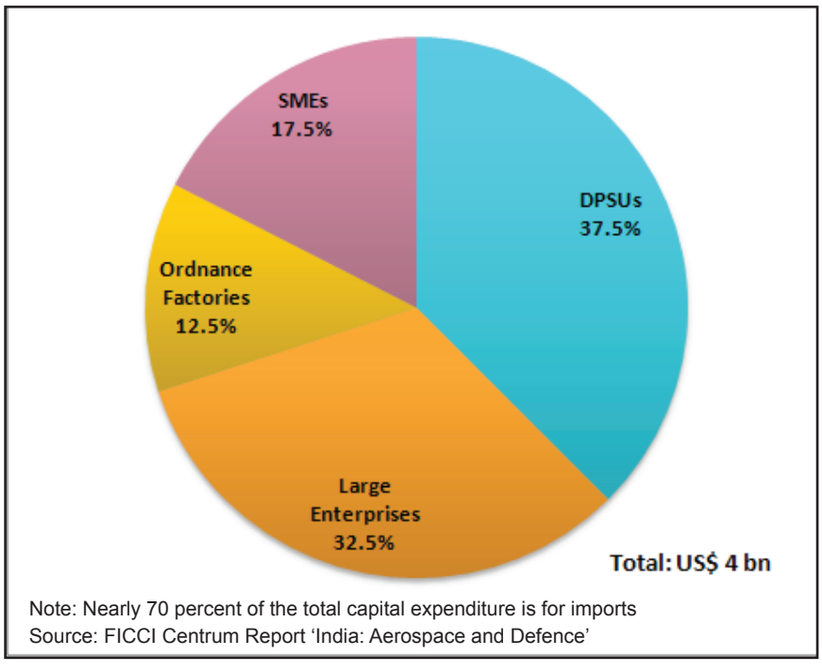
DPSUs and Ordnance Factories dominate the defence industrial base in India. Together, they account for nearly fifty percent of the domestic defence market. There are a total of nine DPSUs and 41 ordnance factories in the country. Several private Indian companies are also engaged in defence equipment production, but they cannot participate in certain sensitive projects. DPSUs and ordnance factories also source some of their requirements from the private sector. In recent times, there has been encouragement to private sector participation in the defence sector (Box 3). Small and medium enterprises (SMEs) also play a crucial role in the defence production space of India. These account for nearly 17.5 percent of the domestic defence market. SMEs are a major supplier of components, sub-assemblies, capital goods, IT hardware, software, etc. to DPSUs and Ordnance factories (Exhibit 10).

Exhibit 9: Segments of the Indian Defence Industry



Note: Build to print: manufacturer produces products, equipment, or components according to the specifications of defence
Build to specs: manufacturer produces products, equipment, or components according to their own specifications and defence adopts it for its application
New product / Upgradation: entire technology is owned by the company, defence has to import the product and the components from foreign vendors

Exhibit 10: Share of Defence Players in Indian Defence Market



Note: Nearly 70 percent of the total capital expenditure is for imports
Source: FICCI Centrum Report 'India: Aerospace and Defence'

Box 3: Encouragement to Private Sector Participation in Defence Production

The following major steps have been taken for encouraging private sector participation for domestic manufacturing of defence equipment:

(i) Technology Perspective and Capability Roadmap, which gives out the details of the equipment and technologies required by the Indian Armed Forces, has been put in public domain to provide the industry an overview of the direction in which the Armed Forces intend to head in terms of capability in future.

(ii) Preference to 'Buy Indian-IDDM', 'Buy (Indian)', 'Buy & Make (Indian)' & 'Make' categories of acquisition over 'Buy (Global)' category, thereby giving preference to the Indian industry in procurement. Details about these procurement types are given in Table 10.

Table 10: Type of Defence Procurements

Parameter	Brief
Buy Indian-IDDM	This category refers to the procurement of products from an Indian vendor meeting one of the two conditions: products that have been indigenously designed, developed and manufactured with a minimum of 40 percent Indigenous Content (IC) on cost basis of the total contract value; or, products having 60% IC on cost basis of the total contract value, which may not have been designed and developed indigenously. Apart from overall IC as detailed above, the same percentage of IC will also be required in • Basic Cost of Equipment; • Cost of Manufacturers' Recommended List of Spares (MRLS); and • Cost of Special Maintenance Tools (SMT) and Special Test Equipment (STE), taken together at all stages, including field evaluation trials (FET) stage.
Buy Global/Buy Indian	"Buy" would mean an outright purchase of equipment. Based on the source of procurement, this category would be classified as "Buy (Indian)" and "Buy (Global)". "Indian" would mean Indian vendors only and "Global" would mean foreign as well as Indian vendors. "Buy (Indian)" must have minimum 40 percent IC on cost basis. Apart from the overall IC being at least 40 percent of the total contract value, a minimum 40 percent IC will also be required in • Basic cost of equipment • Cost of MRLS • Cost of SMT and STE taken together at all stages, including the FET stage
Buy and Make	Acquisitions covered under the 'Buy & Make' decision would refer to an initial procurement of equipment in fully formed state from a foreign vendor, in quantities as considered necessary, followed by indigenous production through an Indian Production Agency, in a phased manner involving transfer of critical technologies.
Buy and Make Indian	Acquisitions covered under the 'Buy & Make (Indian)' decision would mean purchase from an Indian vendor (including an Indian company forming joint venture/establishing production arrangement with OEM), followed by licensed production/indigenous manufacture in the country involving transfer of critical technologies. 'Buy & Make (Indian)' must have minimum 50 percent IC on cost basis. This implies that IC in the total of • Basic cost of equipment • Cost of MRLS • In addition, cost of SMT and STE must be at least 50 percent of the total contract value

Make	Acquisitions covered under the 'Make' category refer to equipment/system/sub-system/sub-assembly, major components, or upgrades thereof, to be designed, developed and manufactured by an Indian vendor. The 'Make' category is further sub-divided into the following: • **Make-I (Government Funded):** Projects under 'Make-I' sub-category will involve Government funding of 90%, released in a phased manner, and based on the progress of the scheme, as per terms agreed between MoD and the vendor. Usually, projects under Make-I sub-category will involve a development period of not less than three years. • **Make-II (Industry Funded):** Projects under Make-II category will involve prototype development of equipment/ system/ platform or their upgrades, or their sub-systems/ sub-assembly/ assemblies/ components with a focus on import substitution, for which no Government funding will be provided for prototype development purposes.
Source: Defence Procurement Procedure 2016, Ministry of Defence, Exim Bank Research	

(iii) The procedure for 'Buy and Make (Indian)' category, has been further simplified in order to make the category more attractive for Indian Defence industry.

(iv) A clear definition of indigenous content has been provided which has not only brought more clarity on the indigenous content required for different categorization, but has also enhanced the indigenization of defence products in India.

(v) Indian private sector industry has also been allowed to receive Maintenance Transfer of Technology in 'Buy (Global)' cases.

(vi) FDI Policy in defence sector has been reviewed and as per the new policy, composite foreign investment up to 49% has been allowed under the automatic route and above 49% on a case-to-case basis under the approval route wherever it is likely to result in access to modern and state-of-the-art technology.

(vii) Defence Products List for the purpose of industrial licensing has been revised and in the revised list most of the components / parts / raw materials have been taken out from the purview of industrial licensing.

(viii) Defence Exports Strategy has been formulated and put in public domain. The Standard Operating Procedure for issuing No Objection Certificate (NOC) for export of military stores has been simplified and made online.

Source: Ministry of Defence, Government of India

India's defence model is at variance from the global one, with more than 80 percent value addition happening at the integrator stage. Component suppliers, many of which are SMEs, account for only the remaining 20 percent[12]. This concentrated model stunts the growth of the private players in the sector and also affects the scope for R&D.

Of the nine DPSUs, Hindustan Aeronautics Ltd (HAL) is the largest. HAL is a Navratna company and is engaged in the field of aviation, spanning fighter aircraft, trainer aircraft and helicopters. The company has 19 production divisions, 10 R&D centres and one facility management division. The sales of the company aggregated ₹ 15607.7 crore in 2014-15, witnessing a CAGR of 4.4 percent during the period between 2010-11 and 2014-15 (Table 11).

Bharat Electronics Limited (BEL) is the second largest DPSU in terms of sales, with its sales registering a CAGR of 5.1 percent during the period 2010-11 to 2014-15 (Table 11). The company has core competencies in the areas of radars and weapon systems, sonars, communication, electronic warfare systems, electro optics and tank electronics, etc. BEL also exports several products including coastal surveillance radar system, radar finger printing system, HF communication sets, radar warning receiver, fitted - up shelters, electronic voting machines, x - ray tubes, electro - mechanical parts (like stators, casing, etc.) and electronic assemblies.

The third largest company in terms of sales is BEML. The sales of the company registered a relatively low CAGR of 1.5 percent during the period 2010-11 to 2014-15 (Table 11). The company is engaged in the design, manufacturing, marketing and after sales service of a wide range of mining and construction equipment, defence and aerospace products and rail and metro products.

Efficiency measured in terms of labour productivity stood at ₹ 724.7 cr (net profit per thousand employees) for the DPSUs (not including Goa

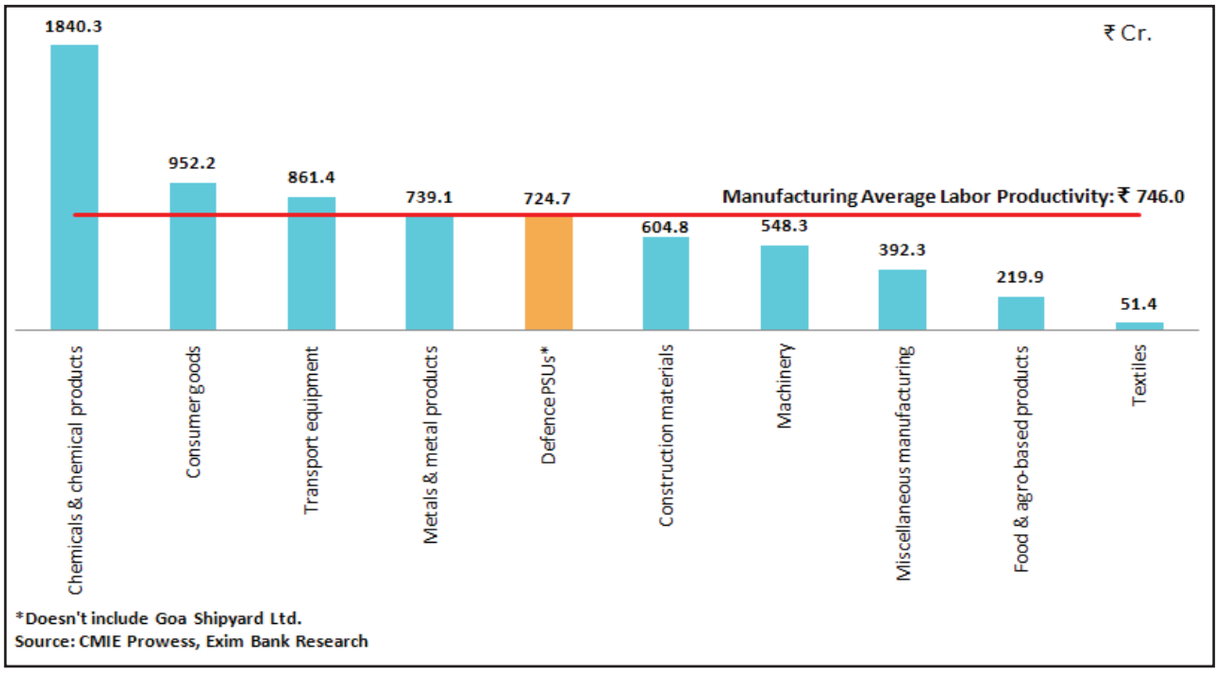
Table 11: Sales of Defence Public Sector Units (₹ Crore)

Company Name	2010-11	2011-12	2012-13	2013-14	2014-15
B E M L	2826.2	2920.7	2998.9	3120.2	2999.2
Bharat Dynamics Ltd.	938.4	959.4	1076.6	1786.0	2799.7*
Bharat Electronics Ltd.	5577.6	5798.6	6104.3	6271.5	6816.1
Garden Reach Shipbuilders & Engineers Ltd.	550.9	548.7	466.5	312.0	2310.2
Goa Shipyard Ltd.	514.9	269.7*	846.5	1166.7	757.1
Hindustan Aeronautics Ltd.	13133.4	13717.2	15062.1	15083.2	15607.7
Hindustan Shipyard Ltd.	1108.1	559.1	479.8	450.9	292.1
Mazagon Dock Shipbuilders Ltd.	666.8	2275.8	2447.4	141.3	2516.3
Mishra Dhatu Nigam Ltd.	418.0	509.3	558.7	562.9	655.8

*Sourced from Annual Reports
Source: CMIE Prowess

[12]Defence Armoring India, Edelweiss Securities Limited

Exhibit 11: Labour Productivity (Profit after Tax per '000 Employees)



Shipyard Ltd.). This is significantly higher than the labour productivity in sectors such as machinery. However, the efficiency lags behind sectors such as consumer goods (₹ 952.2 Cr) and transport equipment (₹ 861.4 Cr). The average labour productivity for domestic manufacturing as a whole was also higher at ₹ 746.0 Cr (Exhibit 11). As against this, labour productivity measured in terms of value added productivity per employee in UK aerospace and defence was nearly 8 percent higher than the productivity in all UK companies[13].

The Indian Ordnance Factories is an industrial setup which functions under the Department of Defence Production of the Ministry of Defence and is, inter alia, a conglomerate of 41 factories under the aegis of the Ordnance Factory Board (OFB). The OFB is engaged in production, testing, logistics, research, development and marketing of a comprehensive product range in the area of land, sea and air systems. The ordnance factories form an integrated base for indigenous production of defence hardware and equipment, with the primary objective of self reliance in equipping the armed forces with state of the art battlefield equipment.

The annual production plan of ordnance factories is based on targets mutually agreed with indentors i.e. Army, Navy, Air Force, Central/State Police etc. The total value of production of Ordnance Factories increased by 2.2 percent from ₹ 11123 crore in 2013-14 to ₹ 11364 crore in 2014-15. Out of this, the production for supply to defence amounted to ₹ 9824 crore in 2014-15 (86.4 percent share), up from ₹ 9295 crore in 2013-14 (83.6 percent share). More than three-fourth of the supplies of OFB are for the Indian Army.

Ordnance factories can be divided into five groups, viz. ammunition and explosives, weapons, vehicles and equipment, material and component, armoured vehicles, and ordnance equipment factories. Ammunition and explosives accounted for 44.1 percent of the total value of issues by all ordnance factories in 2013-14, followed by

[13]Keith Hartley (2012), The Economics of Defence Policy: A New Perspective

Table 12: Value of Issue (VOI)/Achievement vis-à-vis target for Ordnance Factories under OFB (₹ Crore)

Sl. No.	Factory	Total Value of Issues (VOI) excluding Inter Factory Demand						
		2011-12		2012-13		2013-14		2014-15
		Target	Achieve-ment	Target	Achieve-ment	Target	Achieve-ment	Target
Ammunition & Explosives Group								
1	Ammunition Factory Kirkee (AFK)	810	940	842	903	897	869	854
2	Cordite Factory Aravankadu (CFA)	2	12	5	10	4	13	18
3	High Explosive Factory (HEF) Kirkee	89	101	45	54	81	95	84
4	Ordnance Factory Khamaria (OFK)	1258	1151	1275	1182	1433	1316	1478
5	Ordnance Factory Bhandara(OFBA)	40	49	65	72	74	83	77
6	Ordnance Factory Varangaon (OFV)	397	412	451	456	463	463	440
7	Ordnance Factory Chanda (OFCH)	1357	1328	1390	1315	1348	1145	1465
8	Ordnance Factory Bolangir (OFBOL)	836	608	870	628	863	655	862
9	Ordnance Factory Itarasi (OFI)	17	12	24	27	14	18	29
10	Ordnance Factory Dehuroad (OFDR)	293	285	276	241	240	244	303
Sub Total :		*5099*	*4899*	*5243*	*4888*	*5417*	*4901*	*5610*
Weapons, Vehicles & Equipment Group								
1	Gun Carriage Factory (GCF) Jabalpur	245	295	296	290	253	258	205
2	Rifle Factory Ishapore (RFI)	303	307	379	366	308	345	204
3	Gun & Shell Factory (GSF) Cossipore	233	250	249	213	253	256	255
4	Ordnance Factory Kanpur (OFC)	16	16	15	20	21	21	20
5	Small Arms Factory (SAF) Kanpur	193	197	202	190	221	183	120
6	Ordnance Factory Dumdum (OFDC)	4	3	4	3	13	8	24
7	Ordnance Factory Trichy (OFT)	137	156	150	153	123	123	74

8	Field Gun Factory Kanpur (FGK)	72	88	72	82	78	86	77
9	Ordnance Factory Korwa (OFKA)	0	0	0	0	0	1	0
10	Vehicle Factory Jabalpur (VFJ)	1617	1552	1480	1465	1300	1204	1848
11	Grey Iron Foundry Jabalpur (GIF)	0	0	0	0	0	0	0
Sub Total :		*2820*	*2864*	*2847*	*2782*	*2570*	*2485*	*2827*
Material & Component Group								
1	Metal & Steel Factory (MSF) Ishapore	26	31	32	27	15	13	16
2	Ordnance Factory Ambernath (OFA)	44	45	47	38	51	71	52
3	Ordnance Factory Katni (OFKAT)	1	0	0	1.5	15	15	5
4	Ordnance Factory Muradnagar (OFM)	0	0.03	0	0.1	0	0.02	0
5	Ordnance Factory Bhusawal (OFBH)	0.1	0.37	0.12	0.3	0.05	0.09	0
6	Machine Tool Prototype Factory (MTPF) Ambernath	29	29	29	31	36	37	29
7	Ordnance Factory Ambajhari (OFAJ)	6	6	4	3	3	2	2
8	Heavy Alloy Penetrator Project (HAPP)	4	6	8	6	3	9	3
Sub Total :		*110*	*117*	*120*	*107*	*123*	*147*	*107*
Armoured Vehicles Group								
1	Ordnance Cable Factory Chandigarh (OCFC)	15	20	28	29	12	10	22
2	Ordnance Factory Dehradun (OFDUN)	57	58	56	58	83	83	79
3	Heavy Vehicle Factory (HVF) Avadi	2798	2867	2354	2317	1597	1518	1446
4	Ordnance Factory Medak (OFMK)	488	500	513	519	575	503	592
5	Engine Factory Avadi (EFA)	102	113	108	120	137	153	140
6	Opto Electronic Factory (OLF) Dehradun	113	114	84	84	96	96	112
Sub Total :		*3573*	*3672*	*3143*	*3127*	*2500*	*2363*	*2392*

Ordnance Equipment Factories Group								
1	Opto Equipment Factory Kanpur (OEFC)	262	223	372	376	435	443	502
2	Ordnance Clothing Factory Shahjahanpur (OCFS)	206	261	301	302	360	351	416
3	Ordnance Parachute Factory (OPF) Kanpur	114	124	181	133	160	152	185
4	Ordnance Clothing Avadi Factory (OCFAV)	127	157	184	166	190	178	219
5	Ordnance Equipment Factory Hazratpur (OEFHZ)	80	74	88	93	105	103	121
Sub Total :		*789*	*839*	*1126*	*1070*	*1250*	*1227*	*1443*
GRAND TOTAL FOR OFB		***12392***	***12391***	***12479***	***11974***	***11860***	***11123***	***12378***

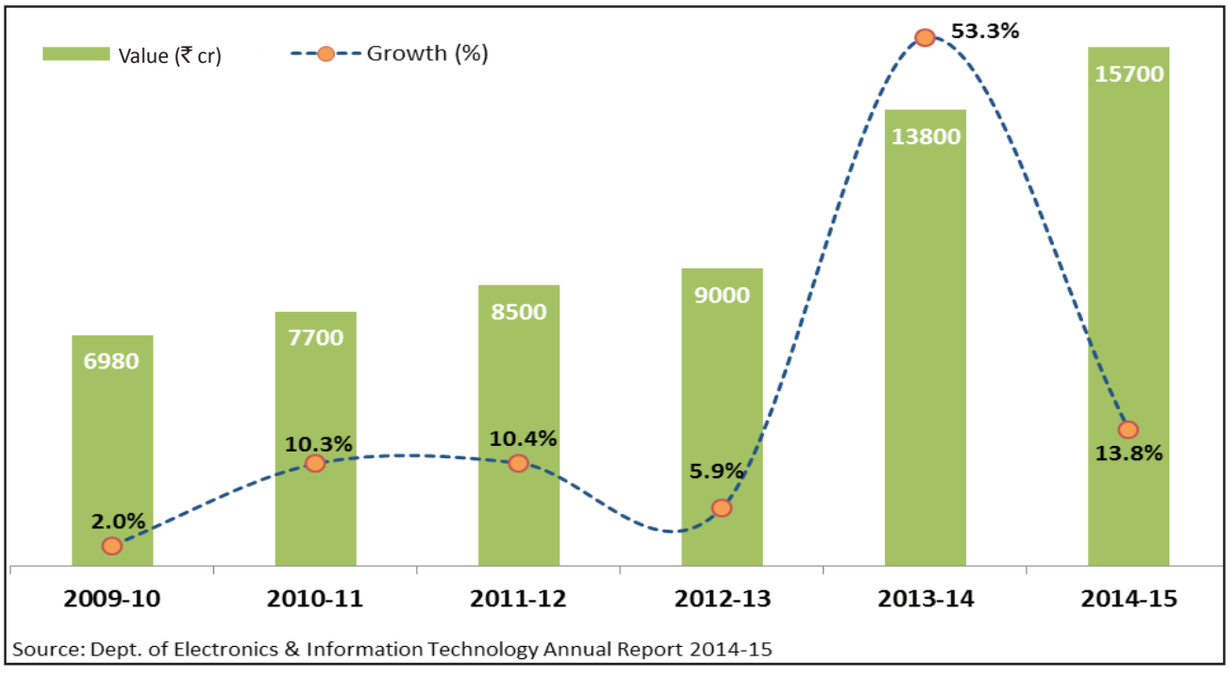
The Value of Issues approximates the sale price of items when issued to the sole customer.
Source: Lok Sabha Unstarred Question No 4384 Answered On 08.08.2014

weapons, vehicles and equipment (22.3 percent) and armoured vehicles (21.2 percent).

After having failed to meet the targets in 2012-13 and 2013-14 when the value of issues as a whole declined at a y-o-y levels of (-) 3.4 percent and (-) 7.1 percent, respectively, the value of OFB production increased by 2.2 percent to touch ₹ 11364 crore in 2014-15, although this was still below the target of ₹ 12378 crore (Table 12). The declines in the previous two years was due to delay in receipt of raw material / components etc, non-receipt of bulk production clearance for certain developmental items and budgetary constraints of Police Forces under the Ministry of Home Affairs.

A major area of production for both DPSUs and OFBs is strategic electronics. Modern warfare systems depend considerably on electronic systems. Products in strategic electronics industry include radars, underwater electronics, communication equipment, electronic warfare equipment, satellite communication and homeland security solutions. India's production of strategic electronics was estimated at ₹ 15700 crore in 2014-15, growing at a y-o-y rate of 13.8 percent. The production has grown consistently over the last few years with production having shot up substantially in 2013-14 by as much as 53.3 percent y-o-y, after which it moderated to a more sustainable level in 2014-15 (Exhibit 12).

Exhibit 12: Production of Strategic Electronics in India



Source: Dept. of Electronics & Information Technology Annual Report 2014-15

DEFENCE PROCUREMENT IN INDIA

One of the key developments in the Indian defence sector over the last decade and a half has been the creation of the Defence Procurement Procedure (DPP). The DPP has evolved over the years witnessing various revisions and amendments, the most recent being DPP-2016. The underlying objectives of the DPP are to essentially streamline the procurement process, make it structured and transparent and to build the capabilities of the Indian defence industry.

DPP aims to reduce the dependence on imports of the equipment and weapons systems that the armed forces need by giving the first opportunity to the Indian industry to meet the requirement. DPP-2016 has provided a level playing field for private companies. This is crucial as foreign procurements, although declining, still remain a major component of the defence procurements.

The share of foreign procurement in total defence procurements under both capital and revenue expenditure increased steadily from 19.7 percent in 2010-11 to 41.0 percent in 2013-14, before dipping to 37.1 percent in 2014-15. Total procurement registered a y-o-y decline of (-) 15.5 percent in 2014-15. Procurement from indigenous sources registered a lower decline of (-) 10.0 percent, as compared to a (-) 23.5 percent decline in procurement from foreign sources during the same year (Table 13).

In 2013-14, the share of indigenous procurement declined for two of the three defence services. The share of indigenous procurement declined most significantly in Navy – from 63.1 percent in 2012-13 to 43.5 percent in 2013-14. There has been a marginal decline of less than a percentage point in the share of indigenous procurements of Army. Only in case of Air Force, there was an increase from 44.1 percent in 2012-13 to 48.2 percent in 2013-14 (Table 14).

Table 13: Procurement Of Defence Items* (₹ Cr.)

Year	Total Procurement	Procurement from Indigenous sources	Procurement from foreign sources	Percentage of 'Procurement from Foreign Sources' out of Total Procurement
2010-11	71859	57734	14125	19.7
2011-12	80318	52167	28151	35.1
2012-13	83090	52720	30370	36.6
2013-14	93217	55014	38203	41.0
2014-15	78754	49532	29222	37.1

*Under both capital and revenue expenditure
Source: Rajya Sabha Unstarred Question No. 1652 answered on 4.8.2015

Table 14: Details of the Procurement* from the Indigenous and Foreign Sources for the Year 2012-13 and 2013-14 (in ₹ Cr.)

Services	2012-13				2013-14			
	Total Procurement	Foreign Procurement	Procurement from Indigenous Sources	Share of Indigenous Procurement	Total Procurement	Foreign Procurement	Procurement from Indigenous Sources	Share of Indigenous Procurement
Army	24782.7	1597.5	23185.2	93.6	24990.0	1747.4	23242.6	93.0
Navy	20216.1	7465.3	12750.8	63.1	23641.0	13362.9	10278.1	43.5
Air Force	38091.4	21308.0	16783.4	44.1	44585.9	23092.4	21493.5	48.2
Total	83090.2	30370.8	52719.4	63.4	93216.9	38202.7	55014.3	59.0

*Under both capital and revenue expenditure
Source: Lok Sabha Starred Question no. 83 answered on 28.11.2014

DEFENCE EXPORTS FROM DPSUs/OFB

Defence exports by Defence Public Sector Undertakings / Ordnance Factory Board from India have witnessed a fluctuating trend over the past few years. In 2013-14, the exports stood at ₹ 686.27 crore, which increased to ₹ 994.04 crore in 2014-15. During April-September 2015, the export value stood at ₹ 695.70 crore (Table 15). The major items exported in 2014-15 are given in Table 16.

Table 15: Value of Defence Equipment Exported by Defence Public Sector Undertakings/ Ordnance Factory Board in India

S.No.	Year	Value (₹ Cr)
1.	2011-12	512.48
2.	2012-13	446.75
3.	2013-14	686.27
4.	2014-15	994.04
5.	2015-16 (upto 30.09.2015)	695.70

Source: Lok Sabha Unstarred Question No. 2221 Answered on 11.12.2015

Table 16: Top Exported Defence Products

Country	Items Exported (2014-15)
Afghanistan	Cheetal Helicopters, Stallion 4X4 MK IV with cargo body
Ecuador	Dhruv Helicopters spares and services
Germany	Mechanical parts, Fuze Point detonating M 572 (assembled with no explosives), light mechanical engineering
Indonesia	Spares for TRS 2215 Radar
Israel	Work packages, Compass, LRF, TIFCS, TIFCS Cable set, TIFCS Installation Kit
Italy	Kavach Mod II
Malaysia	SU-30 Avionics, Helicopter and MIG spares & services
Mauritius	Dhruv/ Dornier & Helicopter Spares & services, Offshore Patrol Vessel (OPV), Ammunitions
Myanmar	RAWL-02 MK-III, Sonar HMS-X
Namibia	CH/CK Helicopter, spares and rotables
Nepal	ALH Helicopter and CH/CK spares and rotables, ammunition, accessories for ammunition, Bulletproof Vest and Fragmentation Jacket, 5.56 mm steel core (28.79,378 pieces).
Oman	Jaguar spares and services, training on engine shaft alignment
Russia	MIG/SU-30 spares and services, RWR, TP for PCB's testing
Singapore	Multipurpose support vessel
Sri Lanka	Indra MK-II Spares, Lion Battery charger, Secure VHF Handheld Radio LVP 285 & services
Suriname	CH/CK Helicopter, spares and services
Switzerland	Cable Looms
Turkey	Bullet Proof Vest + Plates, Helmet, Bullet proof ceramic panel.
UAE	Vacuum Interrupter
The UK	Work packages/ forgings, Transmitting tubes
The USA	Work packages/ forgings, Electronic assemblies, Flight Control panel, Mechanical parts, Vacuum Interrupter
Republic of Korea	Turbocharger

Source: Lok Sabha Unstarred Question No. 843 for Answer on 24.7.2015

During the last three years and the current year, no objection certificates (NOC) for export of military stores to the following countries have been issued:- Algeria, Benin, Nigeria, Bosnia and Herzegovina, Sri Lanka, Paraguay, Japan, Afghanistan, Spain, Nepal, Belgium, Malaysia, Norway, Romania, Port of Spain, Venezuela, France, Vietnam, the UK, UAE, Bangladesh, Ghana, Sweden, Germany, Saudi Arabia, Thailand, Egypt, Burkina Faso, Brazil, Israel, Republic of Korea, Macau, Oman, Tunisia, Libya, Nuevo Leon, Ecuador, Kazakhstan, Uruguay, Netherland, Canada, Russia, the USA, Namibia, Indonesia, Mauritius, Myanmar, Switzerland, Czech, Kenya, Botswana, Tajikistan, Singapore, Ireland, Italy, Gabon and Turkey.

TRADE PERFORMANCE: MAJOR WEAPONS

India's exports of arms have been rather moderate, with exports reaching their highest level in 2009. Some of the important recipients of arms from India include Ecuador, Maldives, Namibia, Nepal, Seychelles and Suriname. In 2014, exports of arms amounted to US$ 53 mn in terms of SIPRI TIVs at constant (1990) prices while cumulatively during 2009-2014, this figure amounted to US$ 96 mn. Over this period, Maldives, Namibia, Nepal, and Seychelles were the only countries with repeat purchases of major weapons from India (Table 17).

Table 17: Country and Year Wise Exports of Arms^ from India

Countries	2009	2010	2011	2012	2013	2014
Ecuador	27					
Maldives		5			5	
Mauritius						41
Namibia			1			2
Nepal			3			5
Seychelles					3	6
Total	**27**	**5**	**3**		**8**	**53**

^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn at constant (1990) prices.
Source: SIPRI

Exhibit 13: Share of Recepient Countries in Major Weapons Exported by India (2009-14)

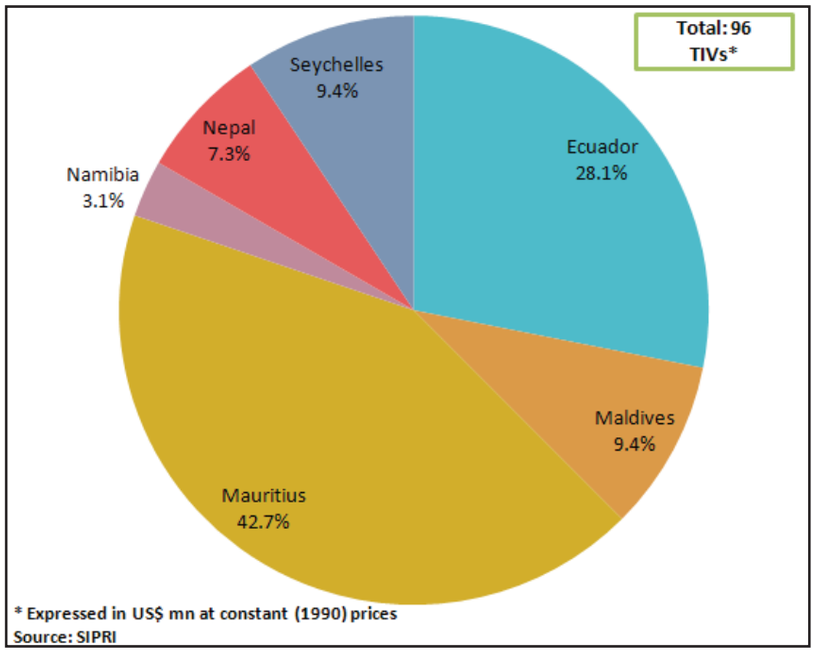


Table 18: Country and Year Wise Imports of Arms^ by India

Countries	2009	2010	2011	2012	2013	2014
Russia	1464	2391	2593	3953	3782	1871
The United States	2	54	203	139	986	1141
Israel	73	112	156	161	119	152
The United Kingdom	112	120	140	160	140	140
France	18	25	29	34	51	52
Ukraine			17	48	101	37
Germany	41	57	32	7	18	34
Switzerland					30	25
Canada					18	15
Italy		12	306	12	6	11
The Netherlands	10	20	1	1		10
Australia	17	17	17			
Poland					11	
South Africa			4	31	31	
Uzbekistan	209	209	209			
Total	**1945**	**3017**	**3706**	**4545**	**5291**	**3487**

^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn at constant (1990) prices.
Source: SIPRI

Exhibit 14: Share of Supplier Countries in Major Weapons Imported by India (2014)

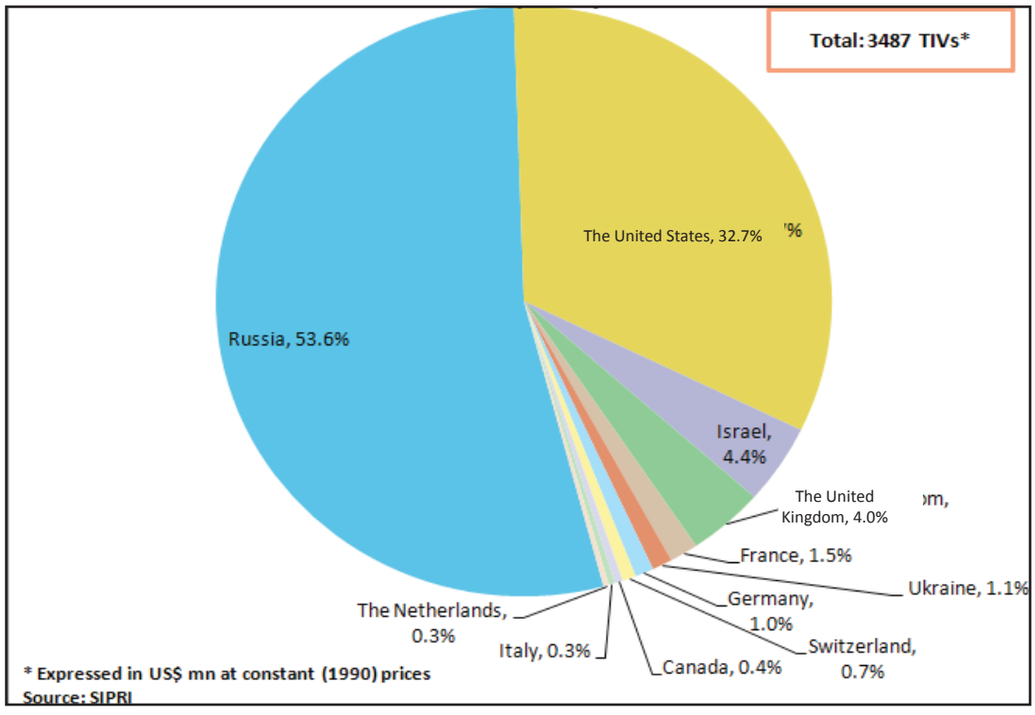
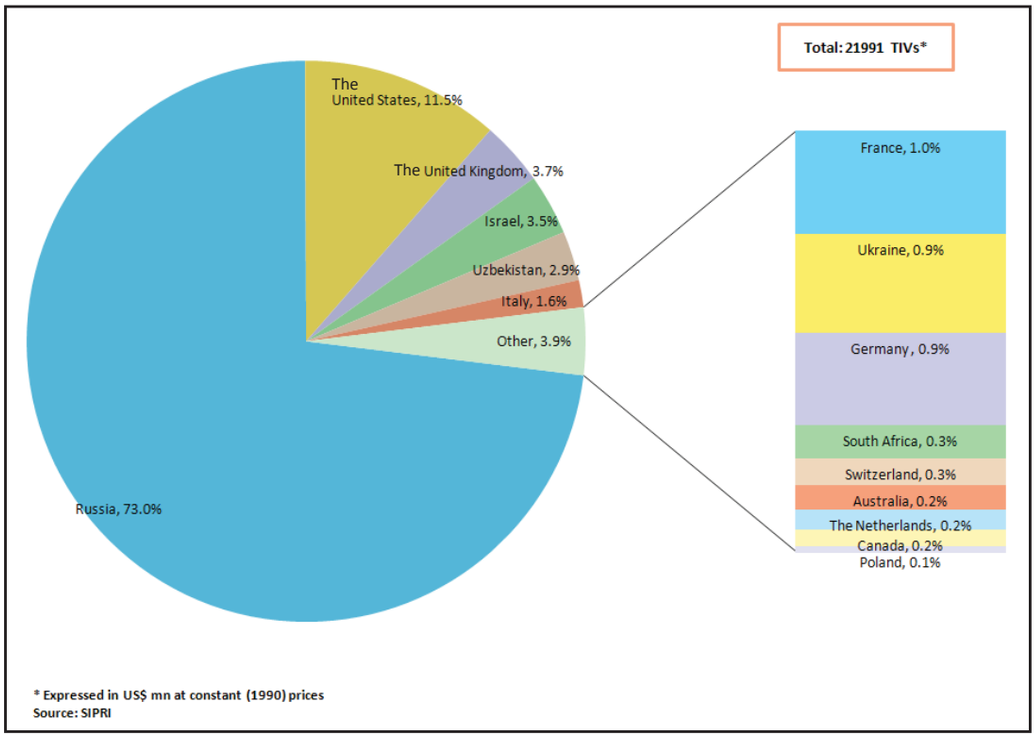


Exhibit 15: Share of Supplier Countries in Major Weapons Imported by India (2009-14)



Mauritius was the largest export destination for India's exports of major weapons cumulatively during 2009-2014, with a share of 42.7 percent. Other major export destinations were Ecuador (28.1 percent), Maldives and Seychelles (9.4 percent each) (Exhibit 13).

In 2014, India's imports of major weapons as classified by SIPRI amounted to US$ 3487 mn in terms of SIPRI TIVs at constant (1990) prices (Table 18). India's imports of major weapons registered a CAGR of 12.4 percent over the period 2009-2014. Russia was the largest import source, accounting for nearly 53.7 percent of the total imports in 2014, followed by the United States (32.7 percent) and Israel (4.4 percent) (Exhibit 14). Even cumulatively, over the five year period 2009-2014, Russia was the largest source accounting for close to three-fourth of all the purchases of major weapons, followed by the United States (11.5 percent), the United Kingdom (3.7 percent), and Israel (3.5 percent) (Exhibit 15).

India's arms exports are limited to aircraft, ships and armoured vehicles. In 2014, the exports were in the categories of ships and aircraft. It was for the first time in the past six years that ships featured as an export category from India. Within aircrafts, India's exports were predominantly in the helicopter segment (Table 19).

Table 19: Weapon Category Wise Exports of Arms^ from India (Values in TIVs*)

Category	2009	2010	2011	2012	2013	2014
Aircraft	27	5	1		8	6
Armoured vehicles			3			
Ships						47
Total	**27**	**5**	**3**		**8**	**53**

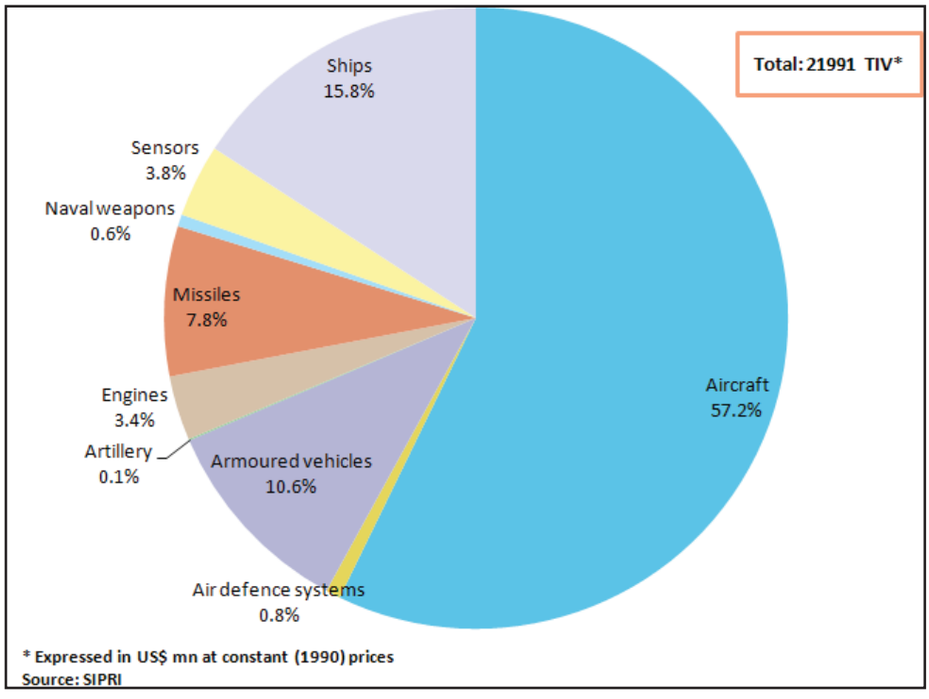
^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn at constant (1990) prices.
Source: SIPRI

Table 20: Weapon Category Wise Imports of Arms^ by India (Values in TIVs*)

Category	2009	2010	2011	2012	2013	2014
Aircraft	1059	2166	2452	1747	2624	2532
Air defence systems	147			8	4	8
Armoured vehicles	400	440	484	563	243	200
Artillery	17					
Engines	40	66	74	73	245	239
Missiles	186	139	180	356	534	321
Naval weapons	1	30	30	30	6	40
Sensors	79	160	176	180	93	148
Ships	17	17	311	1589	1545	
Total	**1945**	**3017**	**3706**	**4545**	**5291**	**3487**

^Only major weapons as classified by SIPRI
*Figures are SIPRI Trend Indicator Values (TIV) expressed in US$ mn at constant (1990) prices.
Source: SIPRI

Exhibit 16: Share of Weapon Categories in India's Major Weapons Imports (2009-2014)



Aircraft accounted for bulk of major weapons imports by India, with a share of 72.6 percent in India's total imports of these products during 2014, followed by missiles (9.2 percent) and engines (6.9 percent). In 2014, India's imports in all categories other than air defence systems, naval weapons and sensors registered a y-o-y decline. Maximum y-o-y growth in imports was witnessed in the category of naval weapons during 2014 (Table 20).

During 2009-2014, aircraft accounted for the largest share of 57.2 percent in India's major weapon imports, followed by ships (15.8 percent) and armoured vehicles (10.6 percent) (Exhibit 16).

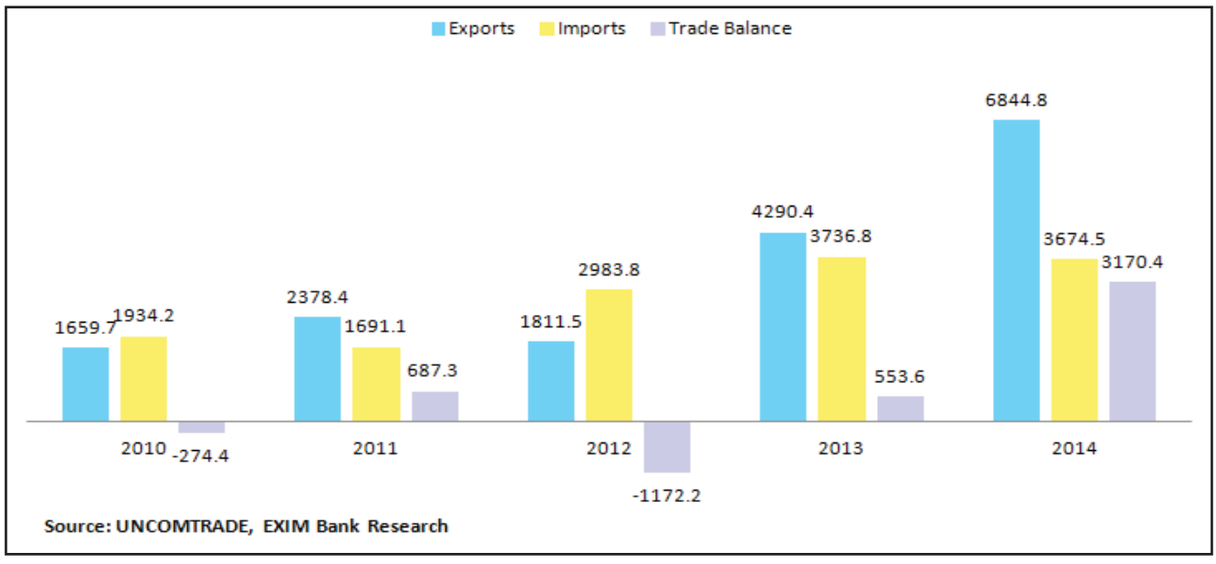
TRADE PERFORMANCE: DEFENCE EQUIPMENT

India remained a net exporter of defence equipment in all the years during the period 2010-2014, except in 2010 and 2012, when trade balance turned negative at US$ 274.4 mn and US$ 1172.2 mn, respectively (Exhibit 17).

Overall, India's exports increased from US$ 1659.7 mn in 2010 to US$ 6844.8 mn in 2014, recording an impressive CAGR of 42.5 percent. Imports increased at a relatively lower pace, from US$ 1934.2 mn to US$ 3674.5 mn, thereby registering a CAGR of 17.4 percent. During 2014, imports recorded a y-o-y decline of (-) 1.7 percent from US$ 3736.8 mn to US$ 3674.5 mn. On the other hand, exports during 2014 registered a robust y-o-y growth rate of 59.5 percent.

Cumulatively from 2010-2014, Sri Lanka was the largest export destination, accounting for 8.4 percent of the total exports of these products from India during the period, followed by the USA (6.1 percent), UAE (5.9 percent), Singapore (4.5 percent), and the UK (3.5 percent) (Exhibit 18).

Exhibit 17: India's Trade in Defence Equipment (Value in US$ Mn)

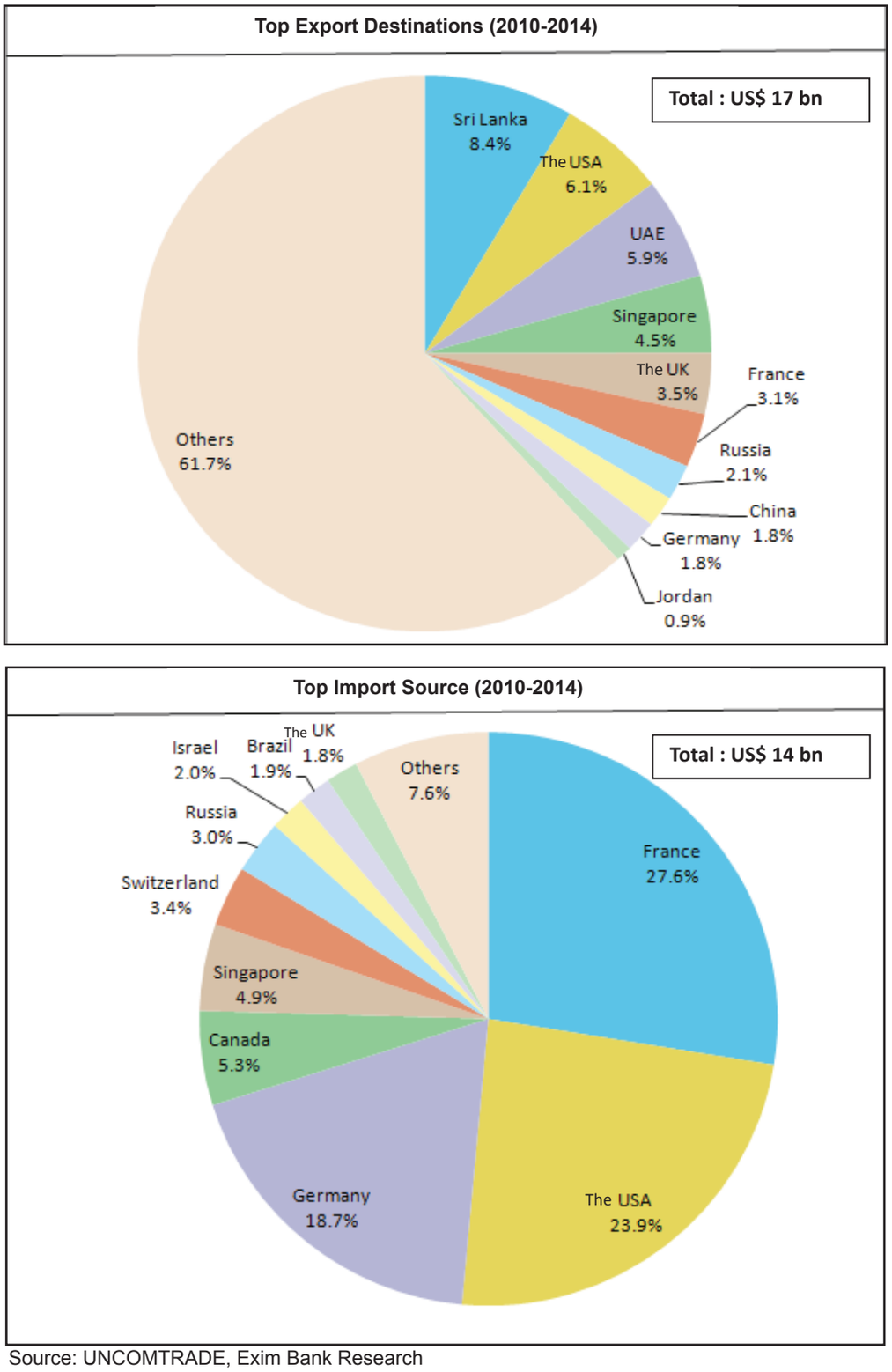


On the imports side, France was, by far, India's largest source for defence equipment accounting for a share of 27.6 percent in the country's cumulative imports of US$ 14020.3 mn during the period 2010-2014. Other major import sources during this period were the USA (23.9 percent), Germany (18.7 percent), Canada (5.3 percent) and Singapore (4.9 percent) (Exhibit 18).

The USA was the top export destination for India during 2010 and 2012, with its share being the highest in 2010 at 33.9 percent. Sri Lanka was the top export destination during 2013 and 2014, with its share being 28.3 percent in 2014. During the period under consideration, the United Kingdom has also been a major export destination, with its share reaching the highest level in 2012 at 15.6 percent. Share of France in India's exports has declined over the years from 12.1 percent in 2010 to 5.6 percent in 2013 and further to 3.6 percent in 2014 (Exhibit 19).

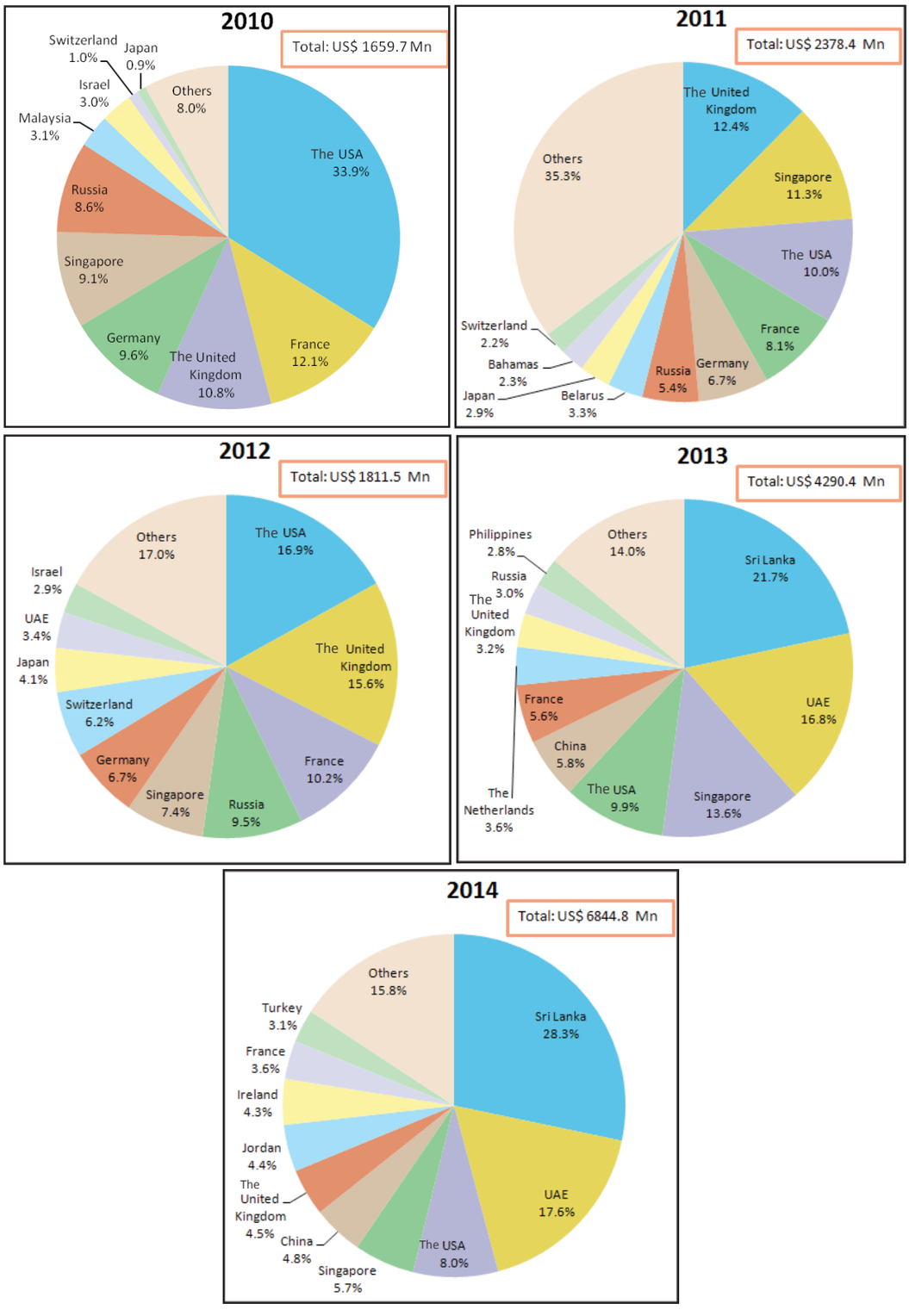
As in the case of major weapons, France, the USA and Germany are among the top sources for India's imports of defence equipment. India's top import sources have varied over the years, with France being the largest import source during 2010 and 2012. In 2010, France contributed to 47.8 percent of India's imports of defence equipment. The USA was the top supplier of defence equipment to India during 2013 and 2014. In 2014, the USA accounted for nearly 42.3 percent of India's total imports of defence equipment. Germany was another major import source for India, with its share being 26.0 percent during 2011 (Exhibit 21).

Exhibit 18: Top Trading Partners for India's Trade in Defence Equipment (2010-2014)



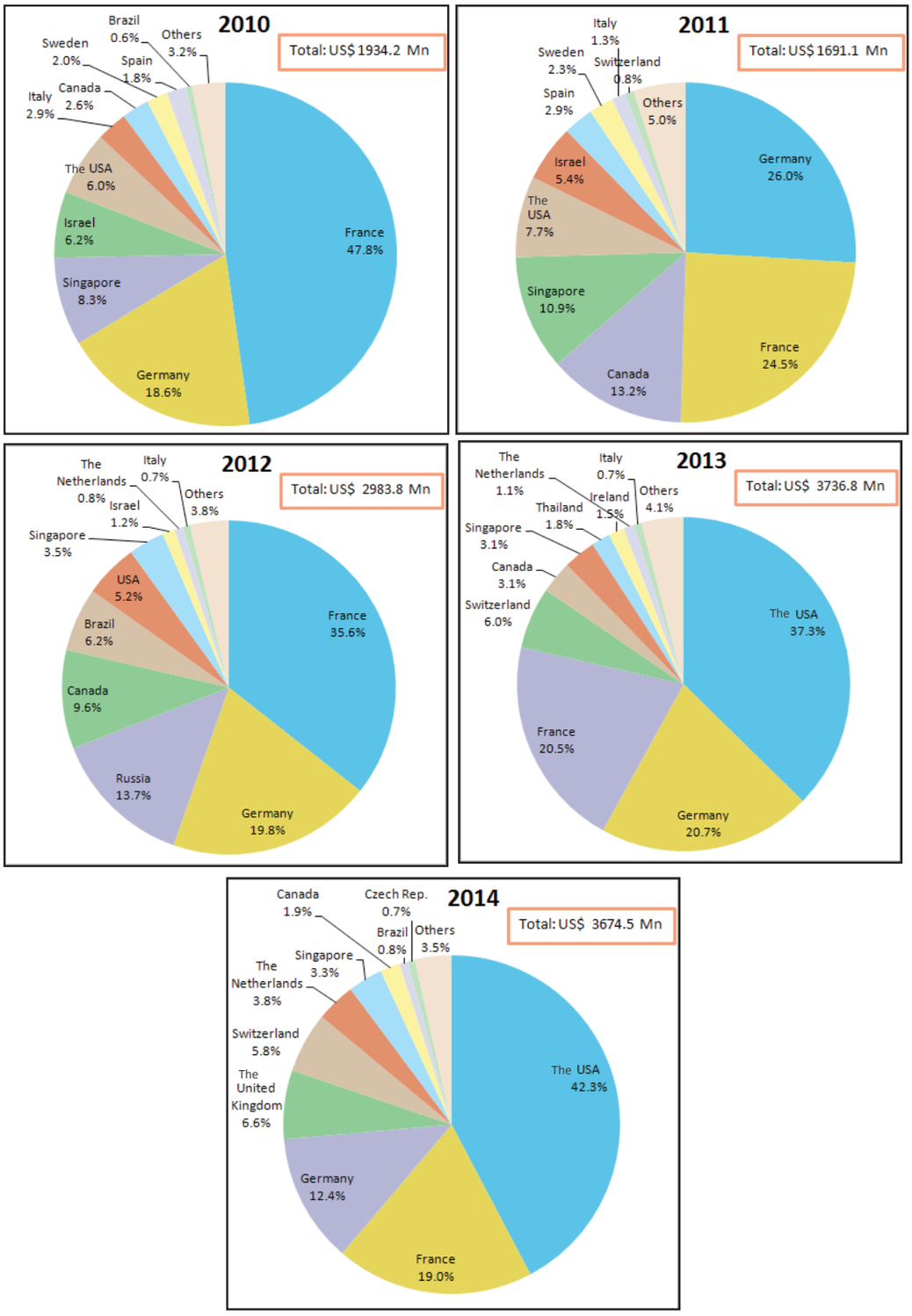
Source: UNCOMTRADE, Exim Bank Research

Exhibit 19: Year-wise Top Export Destinations for Defence Equipment



Source: UNCOMTRADE, Exim Bank Research

Exhibit 20: Year-wise Top Import Sources for Defence Equipment



Source: UNCOMTRADE, Exim Bank Research

Aircraft parts were the largest category of exports, accounting for 20.9 percent of the total exports of defence equipment during 2014 and an even higher share of 48.9 percent cumulatively during 2010-2014. Aircraft, (helicopter, aeroplanes) & spacecraft (satellites) was another major export category with a share of 46.9 percent during 2010-2014. Other export categories had miniscule shares (Table 21).

Table 21: India's Top Item of Exports of Defence Equipment (US$ '000)

HS Code	HS Description	2010	2011	2012	2013	2014	2010-14
8803	Aircraft parts	1483210.6	2156125.6	1708346.5	1527033.6	1427812.5	8302528.9
8802	Aircraft, (helicopter, aeroplanes) & spacecraft (satellites)	44557.7	48258.8	40906.9	2590256.3	5247762.2	7971741.9
8805	Aircraft launching gear; ground flying trainer	6683.5	97870.4	26133.2	33592.9	44670.0	208949.9
8710	Tanks and other armoured fighting vehicles, motorised, and parts	669.6	47571.2	296.9	74868.9	58562.9	181969.5
9305	Arm parts and accessories (of heading 9301 to 9304)	9426.8	14622.6	21308.1	44482.8	40327.4	130167.7
890610	Warships of all kinds	113132.1	46.9	0.0	0.0	0.0	113179.0
9301	Military weapons, other than revolvers, pistols & arms of heading no 9307	0.0	5896.4	10691.6	9668.0	6978.1	33234.1
9306	Bombs, grenades, ammunitions & parts	796.9	2945.5	1295.2	3900.2	12669.8	21607.6
9307	Swords, cutlasses, bayonets, lances, scabbards & sheaths	702.9	2794.4	1622.9	5105.8	4869.8	15095.8
9303	Other firearm & similar devices operating by the firing of an explosive charge	62.9	1861.5	19.6	118.1	198.4	2260.4
8804	Parachutes and parts and accessories thereof	303.1	205.5	763.9	480.1	457.0	2209.6
8801	Balloons, dirigibles, gliders, hang gliders	183.9	71.7	158.2	432.5	464.6	1310.8
9304	Arm nes, excluding those of heading no 9307	0.0	113.3	0.6	449.2	29.9	593.0
9302	Revolvers and pistols, other than those of heading no 9303 or 9304	0.0	0.0	0.0	0.0	15.0	15.0
Total		**1659730.0**	**2378383.8**	**1811543.6**	**4290388.3**	**6844817.8**	**16984863.4**

Source: UNCOMTRADE, Exim Bank Research

On the import front, aircraft, (helicopter, aeroplanes) & spacecraft (satellites); and aircraft parts were the top two categories, with their shares in India's total imports of defence equipment being 72.3 percent and 18.8 percent, respectively during 2010-2014 (Table 22).

PRIVATE PARTICIPATION IN DEFENCE SECTOR

While the Indian defence industry continues to be dominated by the DPSUs and OFB, there has been a gradual trend of increase in private

Table 22: India's Top Item of Imports of Defence Equipment (US$ Mn)

HS Code	HS Description	2010	2011	2012	2013	2014	2010-14
8802	Aircraft, (helicopter, aeroplanes) & spacecraft (satellites)	1388.5	1103.4	1976.3	2981.3	2691.2	10140.6
8803	Aircraft parts	393.5	453.6	475.4	546.4	773.2	2642.1
8805	Aircraft launching gear; ground flying trainer	77.6	62.5	86.0	131.7	139.9	497.6
890610	Warships of all kinds	0.0	0.0	369.1	0.0	0.1	369.2
9306	Bombs, grenades, ammunitions & parts	4.2	5.1	44.1	39.7	45.7	138.8
9305	Arm parts and accessories (of heading 9301 to 9304)	40.0	46.2	4.0	16.4	11.5	118.2
9303	Other firearm & similar devices operating by the firing of an explosive charge	20.0	1.1	4.2	2.5	1.9	29.7
8710	Tanks and other armoured fighting vehicles, motorised, and parts	3.2	7.5	4.6	4.7	1.9	21.9
8804	Parachutes and parts and accessories thereof	3.1	1.4	3.7	8.4	3.2	19.9
9304	Arm nes, excluding those of heading no 9307	1.3	8.1	2.6	2.0	2.9	16.9
9302	Revolvers and pistols, other than those of heading no 9303 or 9304	1.3	0.1	9.3	0.2	0.7	11.6
9301	Military weapons, other than revolvers, pistols & arms of heading no 9307	0.5	1.2	4.2	3.2	2.0	11.1
8801	Balloons, dirigibles, gliders, hang gliders	0.9	0.8	0.1	0.1	0.1	2.0
9307	Swords, cutlasses, bayonets, lances, scabbards & sheaths	0.2	0.1	0.1	0.1	0.2	0.7
Total		**1934.2**	**1691.1**	**2983.8**	**3736.8**	**3674.5**	**14020.3**

Source: UNCOMTRADE, Exim Bank Research

sector participation. To apprise domestic private sector companies early in the acquisition process, the Ministry of Defence, in April 2013, released a Technology Perspective and Capability Roadmap which is based on the 15-year Long Term Integrated Perspective Plan of the armed forces. This is intended to help domestic companies make the necessary long term planning and investment required for product development and production. Further, in DPP - 2016, a new category of 'Indian Designed, Developed and Manufactured' has been introduced, which is the most preferred category. As a result of these facilitating policies, the private sector in India has gained some traction and has made investments in development of defence products and has also engaged in technology tie-ups. This includes efforts from companies like Ashok Leyland, Asta Microwave, Bharat Forge, Centum Electronics, Dynamatic Technologies, L&T, M&M, and Tata SED.

Since the opening of the private sector participation in the defence sector, a total of 333 Industrial Licenses (ILs) have been issued, as on February 2016. Of this, nearly 107 ILs have been issued since the launch of 'Make in India' initiative in September 2014. This is indicative of the success of such initiatives to attract investment from domestic companies in the defence industry (Box 4).

FOREIGN DIRECT INVESTMENT (FDI)

Recently, FDI limit of 26 percent in the defence sector has been raised to 49 percent under the automatic route and above 49 percent on a case-to-case basis under the approval route wherever it is likely to result in access to modern and state-of-the-art technology. Portfolio investment and investment by Foreign Venture Capital Investors have been allowed up to permitted automatic route level of 49 percent. In case of infusion of fresh foreign investment within the permitted automatic route level, resulting in change in the ownership pattern or transfer of stake by existing investor to new foreign investor, Government approval will be required.

During April 2000 to December 2015, a total of US$ 5.02 million of FDI inflows have been received in the defence industry. Moreover, as on 30.06.2015, a total of 34 foreign investment proposals were approved in the defence sector, including products in defence electronics.

However, in terms of foreign capital expenditure (capex), between January 2003 and January 2016, a total of 17 FDI projects were recorded in the space and defence industry of India. These projects represent a total capital investment of US$ 423.90 mn. Maximum capex of US$ 124.5 mn was from Sweden in 3 projects from 2 companies, followed by the UK (US$ 107.4 mn of capex from 3 projects by 2 companies) (Table 23). The United States had the maximum number of FDI projects in India at 6, accounting for US$ 80.8 mn of capex. The top investing companies were Saab AB and BAE Systems.

One outward investment in the space and defence sector has also been recorded. Mahindra & Mahindra in 2010 had set up a joint venture in Ras Al-Khaimah, United Arab Emirates. Mahindra Emirates Vehicle Armouring Fz LLC manufactures custom armoured vehicles for variety of applications. The company has experience in the fields of engineering, prototyping and manufacturing of armoured cars and other armoured vehicles.

OUTLOOK

The 'Make in India' policy of the Government of India for indigenisation of defence programme is expected to reap benefits for the domestic defence industry. India being a major importer

Box 4: Major Initiatives to Attract Investment from Domestic Companies in the Defence Industry

1. The Defence Products List for the purpose of issuing Industrial Licences (ILs) under The Industries (Development and Regulation) (IDR) Act has been revised and most of the components, parts, subsystems, testing equipment, production equipment have been removed from the list, so as to reduce the entry barriers for the industry, particularly small & medium segment.
2. Process of applying for IL and Industrial Entrepreneur Memorandum (IEM) has been made online and this service is now available to entrepreneurs on 24X7 basis at eBiz website.
3. Guidelines have been issued to streamline the processing of applications for grant of extension of validity of Industrial License.
4. The initial validity of the Industrial Licence granted under the IDR Act has been increased from 3 years to 7 years, with a provision to further extend it by 3 years on a case-to-case basis.
5. Partial commencement of production is treated as commencement of production of all the items included in the license.
6. The 'Security Manual for Licensed Defence Industry' has been issued. Regarding the issue of the Security Manual, the requirement of affidavit from the applicants, has been done away with.
7. Restriction of annual capacity in the Industrial License for Defence Sector has been removed.
8. Licensee has been allowed to sell the defence items to the Government entities under the control of Ministry of Home Affairs, PSUs, State Governments and Other Defence Licensee companies, without the approval of Department of Defence production.
9. Application Forms for Industrial License & Industrial Entrepreneur Memorandum have been simplified.
10. The advanced version of NIC Code (NIC 2008) has been adopted, which is closer to international practice.
11. To establish a level-playing field between Indian private sector and the public sector, the anomalies in excise duty/ custom duty have been removed. All Indian industries (public and private) are now subjected to the same kind of excise and custom duty levies.
12. To promote the participation of private sector, particularly SMEs for defence manufacturing, Outsourcing and Vendor Development Guidelines for DPSUs and OFB have been formulated which mandate that each DPSU and OFB shall have a short-term and long-term outsourcing and vendor development plan to gradually increase the outsourcing from the private sector including SMEs. The guidelines also include vendor development for import substitution.
13. The Standard Operating Procedure (SOP) for the issue of No Objection Certificate (NOC) for export of military stores has been revised. Under the revised SOP, the requirement of End User Certificate to be countersigned/ stamped by the Government authorities has been removed for the export of parts, components, sub-systems etc.
14. The list of military stores has been finalised and has been put in the public domain to make the process transparent and unambiguous. The process of receiving applications for NOC for export of military stores and for issuing NOC has been made online to reduce the delay.
15. The FDI policy for the defence sector has been reviewed and amendments have been made to facilitate investment in the sector.
16. Defence Exports Strategy outlining the various steps to be taken, has been formulated.
17. Preference to 'Buy (Indian-IDDM)', 'Buy (Indian)', 'Buy & Make (Indian)' & 'Make' categories of acquisition over 'Buy (Global)' category, thereby giving preference to Indian industry in procurement.

Source: Lok Sabha Unstarred Question No.868 Answered on the 24th July, 2015; DPP - 2016

of defence equipment has immense scope for attracting investments in its defence sector. Steps taken for greater participation of private players in this sector also creates possibilities for setting up of more defence manufacturing facilities, forming of joint ventures and obtaining state-of-the-art technologies. The initiatives taken in electronics manufacturing will also be beneficial for the strategic electronics segment.

Hence, while the demand for defence equipment grows in this unique monopsony industry, the recent initiatives by the Government of India, which is the buyer as well as the regulator, is expected to encourage investments and domestic production.

Table 23: Top Source Countries for India's FDI in Space & Defence Sector (Jan 2003 - Jan 2016)

Source Country	Projects	Capex (US$ mn)	Companies
Sweden	3	124.5	2
UK	3	107.4	2
The United States	6	80.8	6
Israel	3	78.0	3
France	1	26.0	1
Italy	1	7.2	1
Total	**17**	**423.9**	**15**

Note: This data differs from official data on FDI flows as company can raise capital locally, phase their investment over a period of time, and can channel their investment through different countries for tax efficiency.
Source: FDI Markets

3. Review of Defence Related Policies

INTRODUCTION

In several countries across the globe, the defence equipment industry is guided by regulations and policies, aimed towards maintaining a robust defence procurement process, while increasing self-reliance through creation of an environment conducive for the domestic production of defence equipment. The policies largely revolve around the production and procurement of defence equipment, with offsets requirements forming a crucial part of the procurement policies.

Rising military spending has increased the focus on defence procurements. In line with this trend, countries have established procurement procedures and policies suited to their interests. While some countries have a decentralized procurement model, others have centralized government organizations dedicated to defence procurement. In some countries, civilian organizations also hold responsibility for defence procurement.

In countries like the United States, Chile, Mexico and Nigeria, the procurement model is decentralized. The individual armed services (army, navy, and air force) are accountable for acquisition of defence equipment, and have their own procurement process. In most cases, the procurements are supervised by the defence department of the respective country. In several other countries like the United Kingdom, Australia, France, as also in India, centralized government organizations are responsible for procurement of defence equipment, with most of them operating within the purview of their country's defence department. These procurement organizations in some cases function as independent government departments or agencies. Yet another model, in case of countries like Sweden, Switzerland and South Africa, is where the responsibility for defence procurement is on civil organizations that are either state-owned or are a part of the private sector[14].

Offsets have emerged as an increasingly important component of the procurement policies of various countries. There are several prevailing definitions of offsets (Box 5), but in simple terms it can be considered a counteract that balances the effect of imports on the local industry. This is evident from the fact that around 120-130 countries have offset requirements in some or other form, compared to some 15 countries that had such a requirement in the early 1970s[15]. Offsets can be in the form of co-production, subcontracting, licensed production and technology transfers. Offsets can also be unrelated to the item of imports, and could take the form of counter trade transactions, investment, financing activities, export related assistance, and technology transfer[16]. According to some estimates[17], offset obligations impacting non-domestic prime defence contractors are expected to be around US$ 190 bn during 2013-18, peaking in 2016 at nearly US$ 33 billion in annual obligations. In the year 2014, the top seven offsets markets, notably Saudi Arabia, UAE, and

[14]Martin Auger (2014), Defence Procurement Organizations: A Global Comparison, Library of Parliament, Ottawa,Canada.
[15]Laxman Kumar Behra (2015), Defence Offsets: International Best Practices and Lessons for India, IDSA Monograph Series No. 45 June 2015
[16]Ibid.
[17]Avascent

Box 5: Offsets- Literature Review

Offsets have emerged as an integral part of defence trade relations among countries and over the years, several authors have defined the concept. According to Neuman (1985), "offsets, coproduction, barter, and countertrade are compensatory trade agreements—agreements that incorporate some method of reducing the amount of foreign exchange needed to buy a military item or some means of creating revenue to help pay for it".

Udis and Makis (1991) put forward an alternative definition that "…an offset is a contract imposing performance conditions on the seller of a good or service so that the purchasing government can recoup, or offset, some of its investment. In some way, reciprocity beyond that associated with normal market exchange of goods and services is involved".

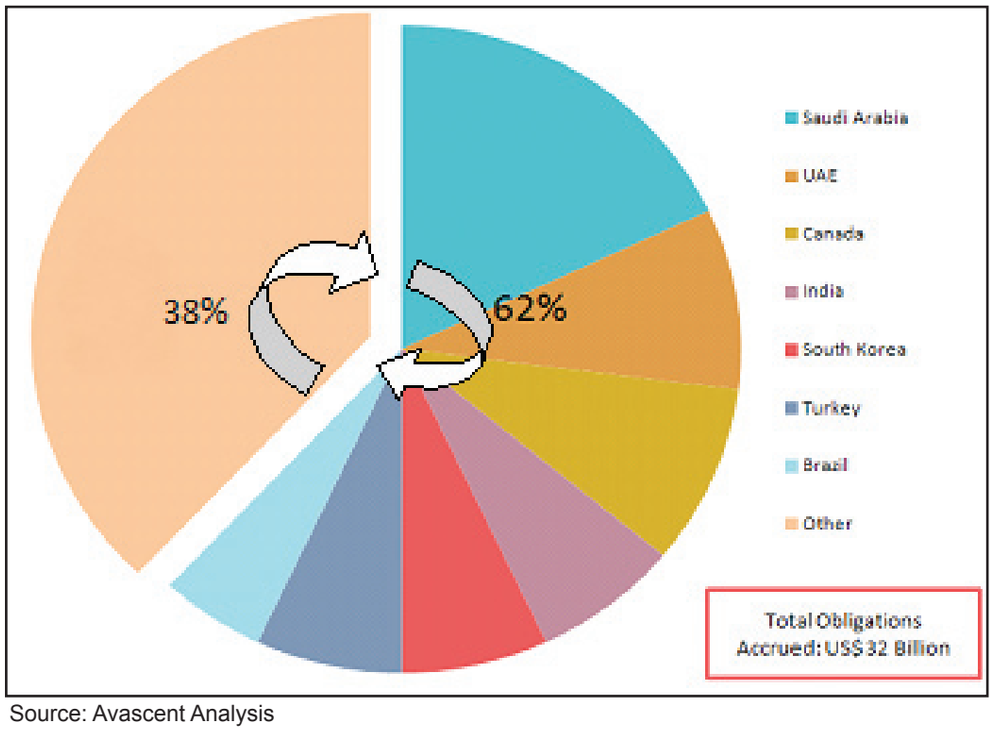
Further, according to Martin and Hartely (1995) "…an offset occurs when the supplier places work to an agreed value with firms in the buying country, over and above what it would have bought in the absence of the offset…and are usually designed to achieve a relocation of economic activity from the country of the equipment supplier to the purchasing nation".

Hall and Markowski (1994) define offsets as "goods and services which form elements of complex voluntary transactions negotiated between governments as purchasers and foreign suppliers…they are those goods and services on which a government chooses to place the label 'offsets'…", which highlights the fact that counteract arising out of the purchase may not be in the sector of purchase.

The defence offsets entail some costs and literature is divided as far as the net benefits from these arrangements are concerned. For the importing countries, conservation of foreign exchange, employment creation, technology transfers, and development of domestic industry are some of the benefits.

Source: Neuman S.G. (1985), "Coproduction, Barter, and Countertrade: Offsets in the International Arms Market", Orbis Vol. 29 (spring); Udis, B. and K. Maskus (1991), "Offsets as Industrial Policy: Lessons from Aerospace", Defence Economics Vol. 2 No. 2; Martin, S. and K. Hartley (1995), "Defense Equipment, Exports and Offsets: The UK Experience", Defense Analysis Vol. 11, No. 1; Hall, P. and S. Markowski (1994), "On the Normality and Abnormality of Offsets Obligations", Defence and Peace Economics Vol. 5, No. 3

Exhibit 21: Global Defence Offset Market (2014)



Source: Avascent Analysis

India along with several others are estimated to have generated over 60 percent (US$ 19.8 bn) of obligations accrued (Exhibit 21).

DEFENCE PRODUCTION AND PROCUREMENT IN INDIA

The Defence Production Policy (DPrP) promulgated in 2011, aims at achieving substantive self-reliance in the design, development and production of equipment, weapon systems, platforms required for defence in as early a time frame possible; creating conditions conducive for the private industry to take an active role in this endeavour; enhancing potential of SMEs in indigenisation; and broadening the defence R&D base of the country.

The DPrP focuses on indigenous design, development and production of defence equipment. For increasing self-reliance, the DPrP emphasizes the need for greater private sector involvement in defence production, including participation by small and medium enterprises. Another focus area is the broadening of defence research and development base.

The DPrP has mandated that defence equipment 'required 10 years or so down the line, will be by and large developed/ integrated/made within the country.' If the defence equipment cannot be produced by the domestic industry in the required time frame, and in accordance with the specifications and quality, then it can be procured from foreign bodies. However, to avoid discrimination against Indian companies, justification will have to be furnished concerning the nature of the weakness of the domestic industry, of the 'urgency and criticality of the requirement', and also of 'the time taken in the procurement and delivery from foreign sources vis-à-vis the time required for making it in the country.'

The DPrP also urges the service headquarters (SHQs) to 'exercise due diligence' in defining the qualitative requirements (QRs) for equipment which are to be domestically produced. The SHQs have been mandated to consider the capability of the domestic industry while deciding upon the operational and technical parameters of the equipment to be procured. Simultaneously, the DPrP document emphasises the role of synergy amongst the various stakeholders, including the academia, R&D institutes, and technical and scientific organizations, through approaches such as consortia, joint ventures and public-private partnership, in order to satisfy the requirements of the defence forces.

From the technological standpoint, the DPrP stresses on 'incremental changes' and technology absorption. Domestic producers getting technological assistance from foreign OEM have been mandated to absorb the necessary technologies. The responsibility for identification of requisite technologies and ensuring their transfer has been assigned to Department of Defence Production (DDP), Defence Research and Development Organisation (DRDO), Headquarters Integrated Defence Staff (HQ IDS) and SHQs. The pivotal role of R&D in defence equipment production has also been recognized.

Given the fact that governments are the sole buyers of defence equipment, the defence production is closely related to the defence procurements by the government. The Defence Procurement Procedure (DPP) 2016 is a step towards greater indigenisation, creation of level playing field for private players, and expediting the entire procurement process. Some of the major changes which have been made in DPP-2016 are:

1. Preference to Domestic Companies

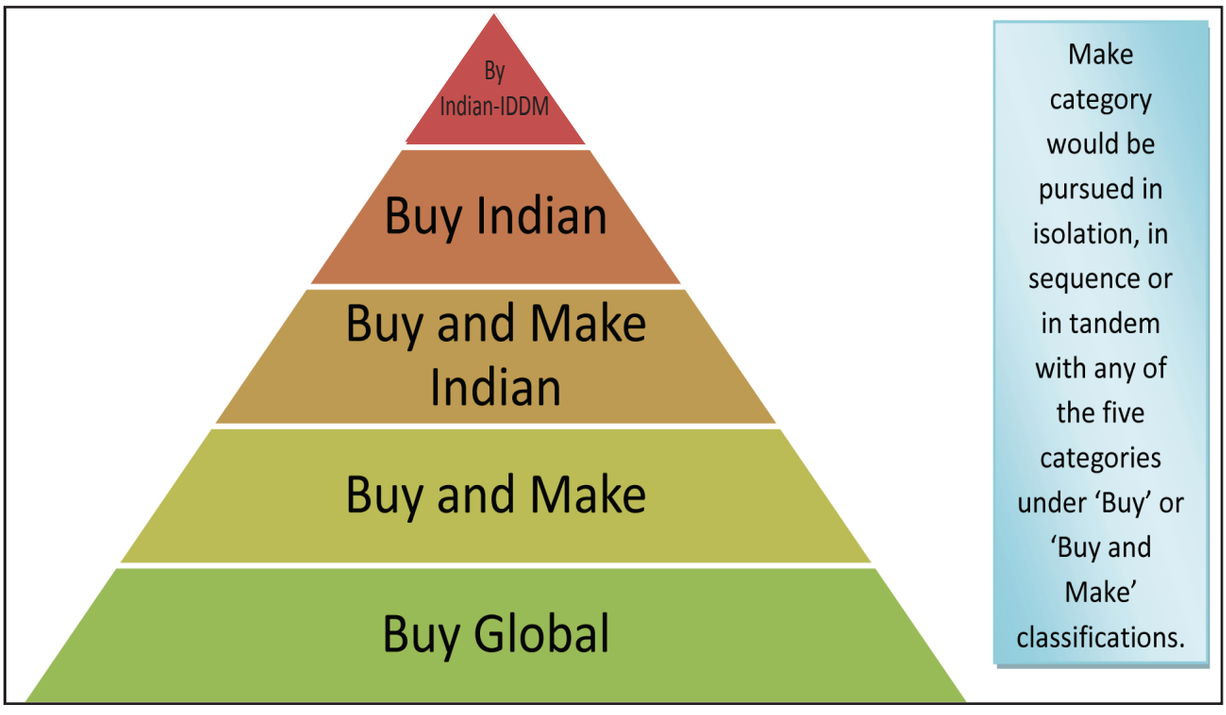
DPP 2016 introduced a new category of Indian Designed, Developed and Manufactured (IDDM) equipment, which will be the most preferred category. Equipment procured under this will be required to have 40 percent of indigenous content if designed indigenously and 60 percent of indigenous content if the design is not indigenous.

Capital Acquisition schemes are broadly classified as, 'Buy', 'Buy and Make', and 'Make'. Under the 'Buy' scheme, procurements are categorized as 'Buy (Indian – IDDM)', 'Buy (Indian)', and 'Buy (Global)'. The three categories under the 'Buy' scheme refer to an outright purchase of equipment. Under the 'Buy and Make' scheme, the procurements are categorized as 'Buy and Make (Indian)' and 'Buy and Make'. The two categories under 'Buy & Make' scheme refer to an initial procurement of equipment in Fully Formed state in quantities as considered necessary, from the appropriate source, followed by indigenous production in a phased manner through comprehensive Transfer of Technology (ToT), pertaining to critical technologies as per the specified range, depth and scope.

Under the DPP 2016, the hierarchy for procurement has been defined, in decreasing order of Buy Indian-IDDM, Buy Indian, Buy and Make Indian, Make Indian, Buy and Make, and Buy Global. Make category would be pursued in isolation, in sequence or in tandem with any of the five categories under 'Buy' or 'Buy and Make' classifications (Exhibit 22).

It is mandatory to provide justification for choosing a lower preference category over the preceding categories while getting the

Exhibit 22: Hierarchy of Procurement Categories



Source: Defence Procurement Procedure 2016, Ministry of Defence, Exim Bank Research

Acceptance of Necessity (AoN)[18] for a procurement programme.

2. Sub-Categorization of 'Make' Catego ry:

'Make' category has been sub-divided into the following:

- Make-I (Government Funded): Projects under 'Make-I' sub-category will involve Government funding of 90%, released in a phased manner, and based on the progress of the scheme, as per terms agreed between MoD and the vendor. The focus under this will be projects involving design and development of equipment, systems, major platforms or upgrades thereof; necessitating harnessing of critical technologies, and involving large infrastructure investment for development, integration, test and manufacturing facilities. Usually, projects under Make-I sub-category will involve a development period of not less than three years.

  Projects under the Make–I sub-category, with estimated cost of prototype development phase not exceeding ₹ 10 crore, will be earmarked for MSMEs. However, if at-least two MSMEs do not express interest for a Make-I program of less than ₹ 10 crore, the same shall be opened up for all, under the condition that interested MSME(s), if any at that stage

[18]Acceptance of Necessity is approval in principle of the Competent Financial Authority to the proposed work or service.

and meeting the eligibility criteria, will get preference over non- MSMEs

- Make-II (Industry Funded): Projects under Make-II category will involve prototype development of equipment / system / platform or their upgrades, or their sub-systems/sub-assembly/assemblies/ components with a focus on import substitution, for which no Government funding will be provided for prototype development purposes. Import substitution will be a key focus of projects under this category. The focus under this will be projects involving design and development of equipment, minor platforms, systems, sub-systems, components, parts or upgrades thereof; use of readily available commercial, military or dual use mature technologies, which may involve marginal infrastructure investment for development, integration, test and manufacturing facilities.

  Projects under the Make–II sub-category, with estimated cost of prototype development phase not exceeding ₹ 3 crore, will be earmarked for MSMEs. However, if no MSME expresses interest for a Make-II program of less than ₹ 3 crore, the same may be opened up for all, under the condition that interested MSME(s), if any at that stage and meeting the eligibility criteria, will get preference over non- MSMEs

3. **Change to Offset Policy:** Changes to the offset policies have also been decided, with the threshold raised from the existing ₹ 300 crore to ₹ 2,000 crore.

4. **Performance parameters of the Services Qualitative Requirement (SQR):** The essential performance parameters of the SQR have been split into two categories. Contracts would be signed if the equipment meets one category of essential parameters that are generally a part of the contemporary equipment available in the market, and form the core of the SQR. These parameters are tested and validated at field evaluation test stage.

   The other category of essential performance parameters are those which may not be originally in the equipment fielded for the field evaluation test, but can be developed and achieved by the vendors using available technologies. These parameters will not be evaluated at the field evaluation test stage, even if any equipment, as claimed by the vendor(s), can meet them. These parameters need to be tested and validated within a specified time frame as stipulated in the contract.

   Enhanced performance parameters (EPPs) are those which enhance the capability of the equipment, vis-à-vis the essential parameters. Equipment successfully meeting the EPP parameters will be awarded a credit score of up to 10 percent while evaluating their commercial bid for the purpose of determining the lowest bidder.

5. **Reduction in Validity of AoN:** Prior to DPP-2016, the AoN lapsed in a period of one year. AoN for categories under 'Buy' and 'Buy and Make' schemes will now be valid for six months. AoN will be valid for one year in case of 'Buy and Make (Indian)' category, and all turnkey projects.

New procurement policy has been formulated based on the recommendations of an Experts Committee set up by the Ministry of Defence to review the existing procurement policy and procedures (Box 6). Some of the recommendations are yet to be part of the official policy.

Box 6: Dhirendra Singh Committee Report

The Dhirendra Singh Committee Report contains several recommendations related to 'Make in India' and the 'Defence Procurement Policy (DPP)'. Some of the key recommendations are:

Strategic Partnership Model

The Committee has recommended forging strategic partnerships in certain select fields such as (i) Aircraft - fighter, transport and helicopters;(ii) Warships of stated displacements and submarines; (iii) Armoured Fighting Vehicles; (iv) Complex weapons which rely on guidance systems, to achieve precision hits, which may include anti-ship, air defence, air to air, air to surface, anti-submarine, land attack, (v) Command, Control, Communication and Computers, Intelligence, Surveillance, Target acquisition and Reconnaissance and (vi) critical materials.

In each of these segments, private sector Strategic Partners (SP) need to be identified and nurtured through a well-defined protocol to create capacity in them over and above the capacity in the Public Sector in these segments.

Procurement System

The Committee highlighted that the Technology Perspective Capability Roadmap (TPCR) in its present form is very broad and information therein is not actionable by the industry to make investment decisions. It also does not enable the industry to plan and get technology partnerships firmed up for specific programs. It has been suggested that the content of TPCR may be made specific with respect to the nature of equipment / systems that would be required to be inducted /up-graded during the next 15 years.

It has also been recommended that the details of schemes, which are considered amenable for 'Make' procedure, should be shared with the industry during regular interactions. The industry may even be involved at feasibility stage itself. The details of other schemes which are to be included in 5 years Services Capital Acquisition Plan should be shared with the industry. Indicative time frames, Preliminary Staff Qualitative Requirements and quantities envisaged may also be given, to the extent practicable and actionable by the industry.

It has also been suggested that the decision of adopting 'Make' procedure must precede other categories for acquisition i.e. Buy or Buy & Make by at least one plan period (5 years), on account of longer gestation period. Moreover, it has also been recommended that under the 'Make' procedure, the eligibility criteria be made liberal to include not only the big players but also the MSMEs. Organisation for implementation is also sought to be strengthened with formation of Project Management Units (PMU) under service headquarters to lend focus and continuity for 'Make' schemes, which by nature would be of long term.

(...Continued...)

(...Continued...)

According to the Committee, suitable provisions also need to be made in DPP to address "single vendor, multiple bids" and "multiple vendors, single product" as are likely to emerge in 'Buy & Make (Indian)' or 'Buy & Make' cases. The Committee has further suggested a 'decision flow chart' to be incorporated in the DPP that would ensure that indigenous capabilities are given first preference.

It has also been suggested that a specialised Defence Acquisition structure be set up outside the formal structure of the Ministry of Defence to serve the purpose of 'Self-reliance' in defence industry.

Minimum Indigenous Content Requirement

According to the Committee, the culture of increasing the share of Indian vendors and indigenous content in capital procurements needs to spread to other entities like the DRDO, the DPSUs, the OFB or any integrator, in their own sourcing. It has been suggested that the minimum indigenous content threshold for Buy (Indian) and Buy & Make (Indian) categories should be revised to 40 percent and 60 percent respectively. For Make category, minimum indigenous content for prototype stage should also be revised to 40 percent. In cases where it is found not feasible to adhere to the norms of indigenous content, categorization committee must be empowered to give their specific recommendations for lower or higher threshold.

Skill Development

Recognizing skill development as a crucial aspect of a budding defence ecosystem, the Committee has recommended that a Defence Manufacturing Sector Skill Council be set up for establishing the standards that would be acceptable by industry and provide direction for future skilling initiatives in the sector with focus on diploma holders. Other major recommendations including initiating MoD's Defence Industry Internship Program, skill development through the offset route, setting up of tool rooms around defence industry clusters, and a university programme for military engineering.

Tax Incentives

According to the Committee, the industry participating in 'Make' schemes may be given tax incentives by way of categorising their contribution (i.e. 20 percent of the development cost of the scheme) as being qualified for treatment as R&D expenditure. Further, 300 percent weighted tax deduction of such development cost in defence schemes should be considered as against 200 percent given by the Department of Science & Technology.

It has also been recommended that the supply of goods in India by Indian Offset Partner (IOP) be treated as 'deemed exports' under the Foreign Trade Policy 2015-2020. Further, such goods should also be treated as 'declared goods' under Central Sales Tax / VAT. This will encourage OEMs to undertake integration activities in India

(...Continued...)

(...Continued...)

Other Recommendations

Some of the other recommendations by the Committee are:

- Create and maintain an up-to-date 'competency map' and registry of Indian defence industry.
- Investments by foreign OEMs in Alternative Investment Fund[19], whose objective will solely be to invest in IOPs eligible under the Defence Offset guidelines, should be considered as eligible means of fulfilling offset obligations.
- The four shipyards within the MoD fold be merged into one corporate entity, retaining the yard facilities in their present geographical locations but working under one single management.
- Every company that has obtained the requisite Defence Industrial License for a particular item must be issued the relevant Request for Proposal as a general rule.
- Indian private sector should be enabled to utilise Government owned facilities like DRDO labs, qualification test facilities under Directorate General Quality Assurance and proof firing ranges etc. on payment basis.
- A part of the MOD's proposed Technology Development Fund may be reserved for funding development projects and limited production from the MSME sector.
- An independent body should be created to ensure expeditious single window clearance for defence exports.
- A single window system for clearance of project proposals in the defence sector to meet Buy (Indian) and Buy and Make (Indian) regulatory and compliance requirements for commencement of business operations should be created.
- The Committee proposed setting up a commercial arm on the lines of the Antrix corporation of ISRO, for providing different services including exports.
- The corporatisation of the Ordnance Factory Board has also been recommended.
- MoD should promulgate a 10 year road map for Indian defence industry with measurable targets both in terms of revenue as percentage of defence capital expenditure as well as in terms of indigenous content value.

Source: Report of the Committee of Experts for Amendments to DPP 2013 including Formulation of Policy Framework

[19] Private funds which can be Venture Capital Funds and Angel Funds, SME Funds, Social Venture Funds and Infrastructure Funds are pooled in India through an Alternative Investment Fund (AIF) which is a vehicle which is incorporated / established under the relevant laws and can be in the form of a trust / company / LLP/ body corporate, and which has collected funds from investors (domestic and foreign) and invests in line with a defined investment policy for the benefit of its investors.

DEFENCE OFFSET GUIDELINES

Like several countries, India has offset guidelines to enable it to leverage its huge arms imports for developing a robust defence equipment production industry in the country. A formal offset policy has been part of the DPP since 2005. The offset policy guidelines, since inception, have undergone several revisions to keep pace with the emerging needs of the Indian industry. Currently, offset provisions apply to the Capital Acquisitions categorized as 'Buy (Global)', i.e. outright purchase from foreign/Indian vendor, or 'Buy and Make', i.e. purchase from foreign vendor followed by Licensed Production, where the estimated cost of the acquisition proposal is ₹ 2000 crore or more. Thirty percent of the estimated cost of the acquisition in 'Buy (Global)' category acquisitions and 30 percent of the foreign exchange component in 'Buy and Make category acquisitions is the requisite offset obligations. However, the Defence Acquisition Council may consider partial or full waiver of offset clause.

With a recent amendment, an option has been given to vendors at the pre-contract stage to submit detailed offset proposals at a later stage. Decisions pertaining to Indian Offset Partners (IOP) and offset product details can be made one year prior to the intended discharge, or the claims can be submitted upon undertaking the offset activity. This will help the vendors in realizing a more realistic offset offer. Further flexibility has been offered to the vendor by allowing for change in IOP/ component and re-phasing of offset schedule at the post-contract stage. Original Equipment Manufacturers can also discharge their offset obligations through 'Services'. While the DPP allowed for discharge of obligations through 'Services' earlier as well, it had been kept under abeyance because no regulatory oversight mechanism was available for this sector. Moreover,

Table 24: Offset- Threshold, Percentage and Multiplier

Country	Threshold Limit (US$ Mn)	Offset Requirement (percent)	Multiplier^
Canada	100*	100	4-9
India	322.6	30	1.5-3
Israel	5	50	1.5
Malaysia	15	100	No multiplier**
South Korea	10	50	No multiplier
Turkey	No Threshold***	70	2-8
UAE	10	60	1.5-5

^The multiplier is the value which when attached with the actual value of the offset obligations gives the total credit value for fulfilment of the offset obligations.
**There is the option of seeking offsets in contracts valued between US$ 2 million and US$ 100 million. The demand for offsets in such cases is determined by three factors: 1) Is the procurement strategic to Canadian industry?; 2) Are the potential bidding companies of interest to Canadian industry and are they capable of fulfilling [offset] obligation?; and 3) Is the project a smaller part of a larger one?*
***Although Malaysia does not allow multipliers as a general rule, it however considers it in "exceptional circumstances such as when the offset programme can lead to high-end technology acquisition or maximisation of FDI into Malaysia."*
****In its revised policy of 2011, Turkey abolished its earlier threshold limit of $10 million, virtually giving it the power to ask for offsets irrespective of the value of contract.*
Source: Laxman Kumar Behra (2015), Defence Offsets: International Best Practices and Lessons for India, IDSA Monograph Series No. 45 June 2015; DPP-2016

in the 'Buy Global' cases, Indian vendors who were earlier in a disadvantageous position in terms of fulfilling offset obligations can now compete at par with the foreign OEMs in terms of fulfilling offset obligations.

Till December 2014, the defence ministry had signed 25 offset contracts - sixteen for the Air Force, six for Navy and three for Army – valued at US$ 4.87 billion.

Laxman Behra (2015) compares India's offset policies with that of Canada, Israel, Malaysia, South Korea, Turkey and UAE. As can be seen in Table 24, except for Canada, India has the highest threshold limit for offsets. This implies that in spite of being a major arms importer, Indian enterprises in defence industry cannot benefit unless the minimum contract value is US$ 322.6 million. India also has the lowest offset percentage requirement among the listed countries. This means, that given the value of an arms contract, the offsets that the Indian industry can get are lower than its counterparts in other countries taken into consideration. However, this will also depend on the value of the multiplier, which ranges between 1.5 and 9 for these select countries.

DOMESTIC AND FOREIGN INVESTMENT POLICY

Up to 49 percent foreign investment is allowed under the automatic route, and above 49 percent on a case-to-case basis under the approval route, wherever it is likely to result in access to modern and state-of-the-art technology. Investments by foreign portfolio investors/FIIs (through portfolio investment) are permitted up to 24 percent under automatic route. Besides, the restrictions such as single largest Indian shareholder to hold at least 51 percent equity and complete restriction on FII existing in the earlier policy have also been removed to facilitate investment in the sector.

Several measures have been taken by the Government for boosting private investment and participation in defence manufacturing, which have been highlighted in Chapter 2 of the current study. This includes, among others, formulation of Outsourcing and Vendor Development Guidelines for DPSUs and OFBs (Box 7). The DPSUs and OFBs have been mandated to have short-term and long-term outsourcing and vendor development plan for increasing the outsourcing from private sector, including SMEs.

POLICIES FOR PROMOTION OF EXPORTS

The Government has taken the following steps for promotion of export of defence equipment from India:

- A Defence Export Strategy has been formulated and put in public domain. The strategy outlines the need for promotional measures and simplification of regulatory processes for facilitating / promoting the export of defence products. Apart from others, the policy highlights plans to leverage Lines of Credit Facility to promote defence exports from India, and explore the possibilities for financing of defence exports through EXIM Bank.

- Standard Operating Procedure (SOP) for issue of No Objection Certificates (NOCs) for export of military stores has been finalized and put in public domain. The detailed SOP is divided into the five parts as follows:

    - Part A: For export of military stores that require a mandatory license for production

Box 7: Outsourcing & Vendor Development Guidelines for DPSUs and OFB

The OEMs of the Defence & Aerospace industry worldwide outsource a substantial part of their manufacturing process to vendors. DPSUs/OFBs also need to focus on their outsourcing efforts, which will add to their capacity enhancement, attain cost effectiveness and improve competitiveness in global market. The other significant objective of this outsourcing is to build a manufacturing eco-system in the country to attain self-reliance. Participation of Indian private sector also helps improve technological and manufacturing capability within the country.

Outsourcing is defined as the act of sourcing goods and services that go into the production of various products by DPSUs/OFB from Indian vendors. The outsourcing contribution is measured in terms of financial value. The formula to measure the outsourcing content of a DPSUs/OFB can be derived as :

VoO = VoP - DI – RM – IVA

percent of VoO = VoO / VoP x 100

Where, VoO : Value of Outsourcing; VoP : Value of Production; DI : Value of Direct Import; RM : Value of Raw Materials purchased from domestic market; IVA : In-house Value Addition (In terms of money value) for conversion of Raw Materials and components to saleable Product. Value Addition will not only cover manufacturing but also the services which adds into value of production.

The Outsourcing and Vendor Development guidelines identify categories of Goods and Services which can be considered for outsourcing.

- The first category of items are low in cost, generic in nature and less technology intensive, e.g. screw, rivets, etc. These must be considered for outsourcing and DPSUs/OFBs shall not make any future investments in manufacturing of these items.
- The second category of items are those manufactured by DPSUs/OFB under Transfer of Technology from Licensors/ OEMs. In this, machining and other operations which are not strategic in nature may be outsourced to Indian vendors. Necessary technical assistance may be shared with potential vendors for initial learning and operational acquaintance.
- The third category comprises less technology-intensive items which are imported by DPSUs/ OFBs. Such items shall be identified and assigned to Indian vendors for indigenous development, and technical assistance must be provided by DPSUs/OFBs.
- Fourth category consists of technology sensitive, strategic and complex items, for which transfer of technology is denied by OEMs/Licensors. These items should be developed/co-developed and indigenised for attaining self-reliance.

The guidelines require each DPSU/OFB to adopt integrated policy of outsourcing and vendor development.

Source: Outsourcing & Vendor Development Guidelines for DPSUs and OFB

- Part B: For export of military stores that are outside the production license purview
- Part C: For export for exhibition purposes
- Part D: For export for testing and evaluation
- Part E: For export for participation in tender

The degree of scrutiny required for grant of export license varies for items, depending on the part it falls under. For the items in the parts A and B, it is mandatory for the exporters to furnish the end use certificate and the proof of integrity of chain of transmission (in case the export is undertaken through intermediaries). These conditions are not mandatory for the items falling under Parts C, D and E, which do not earn revenue as the items are re-imported after the purpose of export is fulfilled. This would be beneficial for the industry as companies will not have to go through rigorous certification process for showcasing their products in the international market.

- On-line system of receiving application for issue of NOC for export of military stores has been introduced.

4. The Private Sector in Defence- Select Country Cases of Policy Support

Traditionally, defence industry has been funded through public investment. However, in view of scarcity of budgetary resources and lack of capacity within the government to implement the entire ambit of defence production programmes, governments in several countries rely significantly on promoting investment through a combination of public investment and private participation. Moreover, countries also provide incentives for R&D promotion in the defence private sector. Further, procurements in several countries are tuned towards encouraging the private sector to innovate, participate and grow.

Several countries today have large private presence in the defence industry. Private sector has significant presence in the defence production of the US, Israel, Brazil and France. In these countries, government support has played an important role in the growth of private defence players.

In France, market forces have been accepted as the guiding principle in the industrial policy for the defence sector. With 5,000 companies in the defence sector, French manufacturing accounts for over a quarter of European capacity. The defence companies in France are driven by the necessity of earning profit, like companies in other sectors. Reforms to the legal framework were made in 1986 and 1993, which encouraged privatization of companies. As on 31 December 2015, the French state had a minority shareholding of 25.97 percent in the Thales Group. In the Airbus Group N.V. as well, the French state had a shareholding of 10.94 percent as on 31 December 2014.

The defence industry in Brazil also has an overwhelming private sector participation. Majority of the industry is in the private sector. Major strategic programmes of the Brazilian government are also executed by private firms, and have propelled innovation in the defence space of the country. There is also significant academia-industry interaction and military research organizations of the Brazilian armed forces work hand in hand with the industry.

Set against this backdrop, this chapter discusses some of the routes taken by various Governments for greater integration of private players in the defence space.

PROMOTING PRIVATE PARTICIPATION THROUGH PUBLIC PRIVATE PARTNERSHIPS

The United Kingdom presents a classic example of a Public Private Partnership model in the defence sector. In 1992, the UK started a new type of partnership known as the Private Finance Initiative (also known as Public Private Partnership Program). Among other things, the Private Finance Initiative (PFI) program includes investments in the defence sector. This PFI allows the government to share risks with the private sector which is better placed to manage some of it.

Even before the PFI, the competitive procurement policy of the UK's Ministry of Defence in 1983 aimed to achieve efficiency by encouraging competition in the spheres of both defence equipment and support services. Support services were contracted out wherever these could be done

more efficiently and economically by the private sector, without compromising on the operational parameters. By 1989, nearly 120 activities were contracted out by the UK Ministry of Defence including activities such as engineering and supply functions at training bases, weapon engineering and maintenance, etc. This reportedly led to a cost saving of nearly 20-30 percent[20].

With the PFI program, the focus of the UK Ministry of Defence on efficiency and private participation was further bolstered. Under PFI, the private sector has committed to financing large up-front capital costs for projects, and has also committed to provisioning of services of an agreed standard over several years. According to the UK Ministry of Defence Policy (MOD) Paper No 4 on Defence Acquisitions, wherever the MOD needed substantial new capital investment, it appraised whether or not it made sense for that investment to come from the private sector rather than from public funds. In PFI, the department contracted services rather than assets, so the MOD first needed to decide whether it would be practical to meet its requirements by means of a contract under which services are provided rather than by the outright purchase of assets such as buildings and equipment. If so, the Department next considered whether such an approach had the potential to offer better value for money than if it bought assets directly. The PFI aimed to achieve this by allowing the MOD to focus on its core military tasks supported by a private sector partner, who could offer services more efficiently or at lesser cost[21]. Since these contracts were largely for long term requirements, the contracts needed to specify the customer requirements with clarity and contained provisions for revisions in future, along with details concerning contract pricing, risk management, performance incentives, procedures for resolving disputes and exit strategies.

The PFI program has several advantages for the Government. It helps in achieving better value for money, while allowing the public sector to focus on providing operational capability. Involvement of the private sector allows for greater innovation and usage of new commercial techniques, thereby leading to improved quality of services. Certain risks such as those associated with delay and cost overruns are transferred to the private sector. The industry benefits from the increased market opportunities and undertakes long-term investment against the security of income from a long-term contract.

The PFI projects have been successful in the UK leading to development of air tankers, strategic sealift, heavy equipment transporters and military satellite communications. The Ministry of Defence in the UK had agreed to a PFI for its acquisition of a military satellite communication system (Skynet 5) at a cost of £4 billion. A PFI contract for the Royal Air Force's (RAF) future strategic tanker aircraft replaced the traditional solution whereby the RAF owned, operated and serviced its fleet of tanker aircraft. The Government entered into a leasing contract for the availability and use of air tanker capability and air passenger transport services. The partnering element in the contract allowed the contractor to hire any spare capacity to third parties (e.g. for commercial air freight operations); but the RAF would always have first call on all the aircraft in an emergency. Long-term support contracts for Royal Navy submarines and warships were also entered into[22].

The PFI policy was modified and launched in 2012 as PF2. The problems perceived in the

[20]Keith Hartley (2015), The Future of Outsourced Services in the UK Defence Sector
[21]Defence Acquisition, Ministry of Defence, Policy Paper No.4
[22] Keith Hartley (2015), The Future of Outsourced Services in the UK Defence Sector

PFI model were resolved in this new policy. PF2 proposed that Government will consider taking an equity stake in all future projects. In order to solve the issue of excessive gains by equity providers, part of the equity under PF2 projects are subject to a funding competition. Steps were taken to ensure greater transparency, including making it compulsory for private sector to provide equity return information. Soft services (catering, cleaning, etc.) have been removed from all future contracts. Some of the risks are now taken by the public sector in order to avoid inefficient pricing of these risks by the private sector. Measures have also been introduced to improve credit rating of projects in order to encourage participation of institutional investors/ pension funds.

France also supports public-private partnerships in the defence space. The PPP arrangements in France are known as Contrat de Partenariat et Equivalents (CPE or contract partnership and equivalents) and includes four types of arrangements - the Contrat de Partenariat (contract partnership), the Bail Emphytéotique Administratif (administrative lease), the Bail Emphytéotique Hospitalier (BEH or hospital lease), the Autorisation d'Occupation Temporaire (AOT or authorization of temporary occupation) with or without a Location avec Option d'Achat (LOA or Rental with Purchase Option). As per the latest available data, from 2004 to 30 June 2011, defence sector signed the second highest value of deals under CPE. The French Ministry of Defence had closed six PPP contracts during this period, including the flagship EUR 992 million Balard Defence Headquarters project which closed in 2011[23].

PRIVATE CAPACITY BUILDING THROUGH THE PROCUREMENT PROCESS

Since the defence industry has a monopsony market, where the Government is the sole buyer, the procurement process is an important tool for creation of opportunities and encouragement of private participation.

The Procurement Process in the United Kingdom is streamlined to facilitate greater sharing of benefits with the private sector. The companies are provided with bonuses for value addition beyond the contractual requirements, in terms of time, cost efficiency and additional technical superiority. There also exist disincentives for underperformance in terms of sanctions. There are also provisions for 'gain share', wherein the reopening and examining of existing contracts bring benefit to both the Government and industry. Advantages of gain share include faster delivery of product or service, performance improvement and lesser costs. Technology advances, changes to trials programs, innovative support arrangements and income stream opportunities from the transfer of assets are examples of gain share that may develop while a contract is in action[24].

Another exemplary program for leveraging the resources of private players is the Australian Industry Capability (AIC) program. Australia has a comprehensive system in place for development of defence ecosystem in the country. The 2010 Defence Industry Policy Statement of Australia contained a framework for identifying and supporting key industrial capabilities, based on the strategic and operational necessity of retaining these capabilities within Australia, of which the AIC program was the key element.

[23]France- PPP Units and Related Institutional Framework, European PPP Expertise Centre, May 2012
[24]Ibid.

The Australian Government started the AIC program with the aim of providing opportunities for Australian companies to compete on their merits for defence work within Australia and overseas; influence foreign Prime Contractors and Original Equipment Manufacturers, including Australian subsidiaries, to deliver cost-effective support; facilitate transfer of technology and access to appropriate Intellectual Property rights; and encourage investment in Australian industry.

The AIC program is conducted on a best value basis and value for money is the prime consideration when determining whether defence capability is to be sourced from Australian or overseas suppliers. The AIC program identifies three types of industry capability (industry requirements):

- Priority Industry Capabilities (PICs): those industry capabilities deemed to confer an essential strategic advantage if existing within Australia and which, if not available, will significantly undermine defence self-reliance and operational capability of Australian Defence Forces (ADF).

- Strategic Industry Capabilities: those industry capabilities that provide Australia with enhanced defence self-reliance, ADF operational capability, or longer term procurement certainty.

- Project/ Product Specific Industry Capabilities: those industry capabilities determined by procurement sponsors as being required to enhance the capability being delivered through inclusion of Australian industry.

In the PIC areas, few prime vendors are appointed and they are assigned long term contracts. Focused vendor landscape per critical area and long term contracts allow long term investments and private sector capability building in the defence sector[25].

ENCOURAGING RESEARCH AND DEVELOPMENT IN DEFENCE SPACE

The US Government supports R&D in defence space through tax incentives and favourable contract structures. The US provides tax incentives for encouraging innovations in the aerospace and defence industry. Tax incentives comprise a basic R&D tax credit and an Alternative Simplified Credit designed to increase incentives for high-risk defence and aerospace research, by permitting the aerospace companies to claim a potential benefit on Qualified Research Expenditures[26].

The US also uses a cost-plus contract structure wherein the contractor is paid for all of its allowed expenses, along with a percentage of the incurred costs. Under fixed-priced contracts wherein the government pays the contractor a set price, contractors may not bid on high-risk endeavours, such as defence R&D project.

The defence space in Brazil also has a supportive environment for R&D. The progress in the innovation climate is evident from the fact that the Embraer has undertaken some big projects in military aircrafts sphere, and possesses an edge in terms of price and technology, when compared to some other major producers. Embraer is currently one of the largest aircraft manufacturers in the world.

Embraer benefitted significantly on account of captive business of the Brazilian air force. To provide the company with an ecosystem of science and technology, educational institutions and research centres were set up around the headquarters of the company, which facilitated

[25]Creating a Vibrant Domestic Defence Manufacturing Sector, Boston Consulting Group, March 2012
[26]Ibid.

academia-industry interactions and collaborations. Moreover, the company along with the government and the Association of the Brazilian Aerospace Industries also engaged in developing a cluster of suppliers and incubated technology based companies. Embraer also entered into risk-sharing partnership with suppliers of important aircraft components.

Israel also has an R&D support program, MEIMAD which focuses on encouraging the development of dual use technologies that can serve both commercial applications and military needs. The maximum support per project is NIS 5 million (~US$ 1.3 mn) and the grant rate is 50 - 66 percent for industrial companies and 50 - 90 percent for research institutions. Programs that consist of the transfer of technology from research institutions to Israeli companies are exempt from paying any royalties[27].

SUPPORTING PRIVATE SECTOR EXPORTS

Australia's Global Supply Chain (GSC) program is an important program which provides funding to a small number of leading international defence capital equipment prime contractors with a presence in Australia, with the aim of encouraging them to explore the potential for competitive Australian firms to participate more broadly in contractor supply chains around the world. The participating prime contractors (primes) establish industry units within their companies and identify bid opportunities across their defence and commercial business units. These opportunities are then contracted to Australian companies based on their capabilities. More often than not, the bid opportunities are also internationally competed, requiring the Australian business to be globally competitive. In addition to providing bid opportunities, the GSC primes (namely, BAE Systems, Boeing, Finmeccanica, Lockheed Martin, Northrop Grumman, Raytheon and Thales) advocate on behalf of Australian industry, train and mentor companies in the primes purchasing practices and methods, and provide a range of market assistance including facilitating visits and meetings with key decision makers.

The Australian Military Sales Office (AMSO) has also been created to facilitate the overseas sales of Australian made capital equipment through government-to-government channels. The Government through the AMSO puts its reputation directly behind Australian suppliers to decrease risk perceptions among international customers. The AMSO has an extensive network of international military contacts which helps the defence exporters of small and medium sizes to export their products.

In Turkey, the government has established the Undersecretariat for Defence Industries (SSM) for building a modern national defence industry in the country. The SSM plays a crucial role in promoting defence exports and is tasked with the following functions-

- Carry out the decisions taken by the Defence Industry Executive Committee[28];
- Reorganize existing Turkish industry in line with the prerequisites of defence industry;
- Plan the production of modern arms and equipment in private and public sector entities;
- Conduct research and development of modern arms and equipment and to have their prototypes manufactured;

[27]Ernst & Young, Government Incentives, January 2015

[28]Defence Industry Executive Committee is the main decision making body in Turkey, chaired by the Prime Minister, and includes the Chief of General Staff and the Minister of National Defence as its members.

- Coordinate export and offset trade issues relating to defence industry products.

The SSM aims to reduce import dependence of critical subsystems/components/technologies, increase indigenous production of defence equipment, and promote R&D projects that are compatible with the needs and objectives of the defence forces. The SSM has the Defence Industry Support Fund as its important source of capital. It is a highly flexible fund with a constant flow of financial resources. The fund does not depend on annual national defence budget allocations but receives earmarked revenues directly - 10 percent of taxes on fuel, 5 percent of individual and corporate income taxes, and taxes on alcohol and tobacco. Since 1986, 80 percent of the fund has been allocated for domestic production purposes, 16 percent for direct procurement projects and the remaining 4 percent for Advanced Technologies Industrial Park Project. Most of the major projects encouraged by SSM have been international joint ventures and coproduction enterprises.

As part of its export strategy, SSM has set up Defence Industry Cooperation Offices in the Middle East, North Africa, the Far East, Central Asia, Eastern Europe and South America, which have been considered priority target areas for the export of Turkish defence products. These offices are expected to prepare ground for good relations, follow ongoing local defence tenders and provide the information to concerned Turkish defence companies, and to operate as a liaison office, setting up contacts between local authorities and Turkish companies.

The International Cooperation Department of the SSM also promotes Turkish defence capabilities through participation in international defence fairs. It also establishes relations with international institutions, organizations and agencies such as NATO, and foreign governments to promote multilateral defence cooperation and joint procurement efforts.

ROLE OF EXPORT CREDIT AGENCIES

Export Credit Agencies (ECAs) have been supporting their national economies by promoting and protecting cross-border trade in goods and services, and offshore investments. Many ECAs help finance the export of weapons to developing countries, as well as nuclear power plants and large fossil fuel extraction and power projects. It may be noted that a supranational institution like the World Bank, does not fund either the export of arms or the construction of nuclear power plants, whereas most ECAs have no such bindings.

Export-Import Bank of the United States

Since 1994, the Export-Import Bank of the United States (Exim-US) had been, inter alia, mandated to provide financial support to exports of defence equipment and services from the country. Only nonlethal equipment, primarily meant for civilian use were to be supported through Exim-US financing. These dual-use export items include aircraft that are used mainly for civilian or humanitarian purposes by foreign militaries. As of May 2015, Exim-US had financed a total of US$ 1.67 billion in dual-use exports[29].

As per the policy of Exim-US, the definitions of “defence articles” and “defence services” are based on the end user of the concerned item, and also by the nature of the item and the use to which it will be put. For example, according to Exim-US, furniture sold to a military organization for military

[29]‘Monitoring of Dual-Use Exports Should Be Improved’, Report to Congressional Committee, Export-Import Bank, August 2014

use (e.g., for offices or homes occupied by military personnel) is deemed a defence article. However, helicopters sold to a private firm or civilian police force are not defence articles. According to Exim-US policy, an export is eligible for financing as a dual-use item if convincing evidence exists that the export is nonlethal in nature and will be used mainly for civilian activities. The determination of eligibility for dual-use financing may require applicants to provide additional information beyond the contract and transaction data Exim-US normally requires for a loan or guarantee.

UK Export Finance (erstwhile Export Credits Guarantee Department)

UK Export Finance (UKEF) support for defence exports is conditional upon exporters obtaining valid export licences from the United Kingdom Export Control Organization (ECO) (part of the Department for Business, Innovation and Skills). All applications are assessed, on a case-by-case basis, against the consolidated EU and National Arms Export Licensing criteria.

Defence accounted for nearly 5 percent of the business supported by the UKEF during 2014-15 (Table 25). In the last five years, the share of defence in total export finance had peaked at 47 percent in 2012-13, as significant defence export contracts were supported during the year by way of credit insurance and bond support in relation to the supply of Eurofighter Typhoon and Hawk aircraft to Oman.

Japan's Military Exports through ODA Assistance

In February 2015, the Japanese Cabinet endorsed the new Development Cooperation Charter, which stipulates that Japan can use its Overseas Development Assistance (ODA) to fund foreign military forces, provided that the funds are used for non-military purposes[30]. The charter has also prioritised the Asian region for receipt of Japanese ODA.

Even in the past, Japan has supported its strategic partners through its ODA assistance for security and defence needs of the countries. In June 2006, Japan had allocated 1.92 billion yen to Indonesia for construction of three high-speed patrol ships classified as 'military vessels', to be used for preventing piracy, maritime terrorism and proliferation of weapons. Moreover, in a joint statement of the US- Japan Security Consultative Committee in April 2012, the Japanese Government had announced its intent to use the ODA for promotion of safety in the region. In 2012 itself, Vietnam and Philippines were provided

Table 25: Type of Business Supported by UKEF – Five Year Summary (% share)

	2010–11	2011–12	2012–13	2013–14	2014–15
Aerospace	62	79	43	42	35
Civil	34	21	10	58	60
Defence	4	<1	47	<1	5

Source: UKEF

[30]Bart Gaens (2015), Securitizing Aid: The Nexus between Japan's Development Cooperation and Security Policy, FIIA Briefing Paper 174

assistance of strategic nature. Japan has extended ODA to the Philippines and Indonesia to help those governments buy Japanese-built ships for coastal patrols. Further, in July 2013, 10 new coastguard patrol ships were provided to Philippines as part of Japan's ODA. In August 2014, Japan announced its intention to provide six used vessels for conversion into patrol boats to support Vietnam's maritime defence activities in the South China Sea through its ODA program.

Export Finance and Insurance Corporation (EFIC), Australia

EFIC has helped a number of defence related exporters as they can face specific financing challenges, due to the specialised nature of the goods and services being exported, the limited number of buyers, and government procurement rules. In 2013-14, EFIC assisted four defence-related exporters, which included a grant to Ferra Engineering Pty Ltd, an Australian company exporting aircraft parts to the United States for the Joint Strike Fighter project.

Brazilian Industrial Development Bank (BNDES), Brazil

The BNDES had a significant role in the success of Embraer, as it not only provided the company with concessional loans, but was also an important shareholder in the company. BNDES supports both the civil aviation and defence sectors of Embraer. As per the data available in September 2014, the cumulative value of exports financed by BNDES in the defence and security sector of Embraer reached US$ 181 million[31].

[31] Ruttimann, André de Barros; Fonseca, Paulus Vinicius da Rocha; Pinto, Rafael de Carvalho Cayres. Perspectivas para o apoio do BNDES à Embraer à luz de seu posicionamento competitivo e estratégia de crescimento. BNDES Setorial, Rio de Janeiro, n. 40, p. 283-321, set. 2014

5. Product and Market Identification of Defence Products

INTRODUCTION

The global defence market provides significant opportunities for Indian defence companies to grow and achieve economies of scale, as also increase their efficiency levels. While Indian defence exports have registered robust increase in the recent past, in order to continue this trend forward, it might be essential for domestic producers to expand their supply base into overseas markets. Currently, India's defence production is largely geared towards the domestic market, with only a small share being exported. The country has significant comparative advantage in several of the defence products, which can be explored for bolstering exports.

The present section undertakes an analysis of defence products and markets where India's exports have demonstrated comparative advantage. Quantification of comparative advantage over a period of time will help in understanding the markets and products where India has been performing well, as well as identifying the areas where producers have lost ground and success has been limited. This will be a necessary first step towards identification of areas where Indian companies can expand their presence. The analysis is based purely on quantitative data and does not take into consideration any qualitative aspects including regulations surrounding the export of defence products from India or the import control regime of the identified markets.

COMPETITIVENESS INDICATORS

Revealed Comparative Indices are used to identify categories of exports in which an economy has a comparative advantage by way of comparison of the country's trade scenario with the world scenario. The basic assumption underlying the concept of revealed comparative advantage is that trade profile reflects the inter-country differences in terms of relative costs as well as non-price aspects. As per Balassa's (1965) measure, index for country i, commodity j is-

$$RCA_{ij} = \frac{(X_{ji} / X_i)}{(X_{jw} / X_w)}$$

Where,

X_{ji}: exports of commodity j from country i

X_i: total exports from country i

X_{jw}: total exports of commodity j from world

X_w: total exports from world

The RCA index ranges from 0 to infinity, with 1 as the break-even point. That is, a RCA value of less than 1 means that the product does not have a comparative advantage, while a value above 1 indicates that the product has a comparative advantage.

In order to enable disaggregation of the analysis of revealed comparative advantage at the regional and bilateral levels, the above equation is adapted as follows:

$$RCA_{ijr} = \frac{(X_{jr} / X_r)}{(X_{ji} / X_i)}$$

Where,

Xji: exports of commodity j from country i

Xi: total exports from country i

Xjr: exports of commodity j from region r

Xr: total exports from region r

The normalized revealed comparative advantage (NRCA) index has been demonstrated capable of revealing the extent of comparative advantage that a country has in a commodity more precisely and consistently than other alternative RCA indices in the literature. NRCA can be defined in the following manner-

$$NRCA_{ij} = \frac{RCA_{ij}(\text{or } RCA_{ijr}) - 1}{RCA_{ij}(\text{or } RCA_{ijr}) + 1}$$

NRCA ranges from -1 to 1 with 0 as the break-even point. That is, an NRCA value of less than 0 and greater than -1, means that the product has no export comparative advantage, while a value above 0 and less than 1, indicates that the product has a comparative advantage. The extent of comparative advantage/disadvantage can be gauged from the proximity of the NRCA values to the extreme data points, viz. +1 and -1.

For the purpose of analysis, defence exports at HS-four and six digit levels have been considered[32], and the regions of East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia and Sub-Saharan Africa have been taken into consideration.

PRODUCT AND MARKET IDENTIFICATION

An attempt has been made to map the global demand for defence products with India's export competitiveness, with a view to outlining a market specific approach for exporters. A generic analysis has been attempted in order to identify products that have strong capabilities to export. Also analyzed are the current export markets where India has penetrated and the key competitors which India faces. While the country needs to further consolidate its share in the major import markets, there are markets where India already has export competitiveness, and that country's imports have witnessed strong growth. These markets are the potential growth drivers for India's defence exports and need to be suitably targeted.

This chapter attempts to identify the products where India could focus on, to realize potentially higher values, especially when considering that the country already possesses manufacturing capabilities for these products. The idea is to construct a product market matrix for defence products in demand along with the major demand centres (importers), and the key exporters to these regions (India's competitors).

Methodology:

The analysis in this section considers three major determinants of India's performance in overseas markets, namely:

- The regional NRCA for products at the aggregate level as well as at HS 4-digit and 6-digit levels.

[32]890610(Warships of all kinds); 8710 (Tanks and other armoured fighting vehicles, motorised, and parts); 8801 (Balloons, dirigibles, gliders, hang gliders); 8802 [Aircraft, (helicopter, aeroplanes) & spacecraft (satellites)]; 8803 (Aircraft parts); 8804 (Parachutes and parts and accessories thereof); 8805 (Aircraft launching gear; ground flying trainer); 9301 (Military weapons, other than revolvers, pistols & arms of heading number 9307); 9302 (Revolvers and pistols, other than those of heading number 9303 or 9304); 9303 (Other firearm & similar devices operating by the firing of an explosive charge); 9304 (Arm nes, excluding those of heading no 9307); 9305 [Arm parts and accessories (of heading 9301 to 9304)]; 9306 (Bombs, grenades, ammunitions & parts); and 9307 (Swords, cutlasses, bayonets, lances, scabbards & sheaths)

- Average Annual Growth Rate (AAGR) of regional import demand at the aggregate, as well as disaggregate level.

- Cumulative value of regional import demand from 2010-2014.

On the basis of these three considerations, a four quadrant bubble chart is prepared for simultaneous product and market identification. The size of the bubble represents the relative regional import demand of the products. The four quadrants imply the following:

- Product Champions (positive AAGR; positive NRCA): These products have the maximum potential, as the regional import demand in these products has shown robust AAGR over the period 2010-2014, while India's exports of these products to the region are competitive. A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.

- Underachievers (positive AAGR; negative NRCA): India does not have competitiveness in these products, while their import demand from the regions has grown significantly over the period under consideration. India can strive towards increasing competitiveness in these markets for the identified products.

- Declining Sectors (negative AAGR; negative NRCA): India does not have competitiveness in these products, and these sectors have also registered weak growth in the region.

- Achievers in Adversity (negative AAGR; positive NRCA): India has competitiveness in these products, but the growth rate in the region for these products has been declining.

Indian players can look towards concentrating more on the product champions segment, if there is scope for diversification into other areas of defence production. Else, they can attempt to diversify into those regions where the product category has been witnessing strong growth rates.

Given that the focus needs to be primarily on defence products which figure under the Product Champions category, a further analysis of this categorization has been undertaken to identify the major importing countries in the regions for these products.

AGGREGATE LEVEL IDENTIFICATION OF PROMISING MARKETS

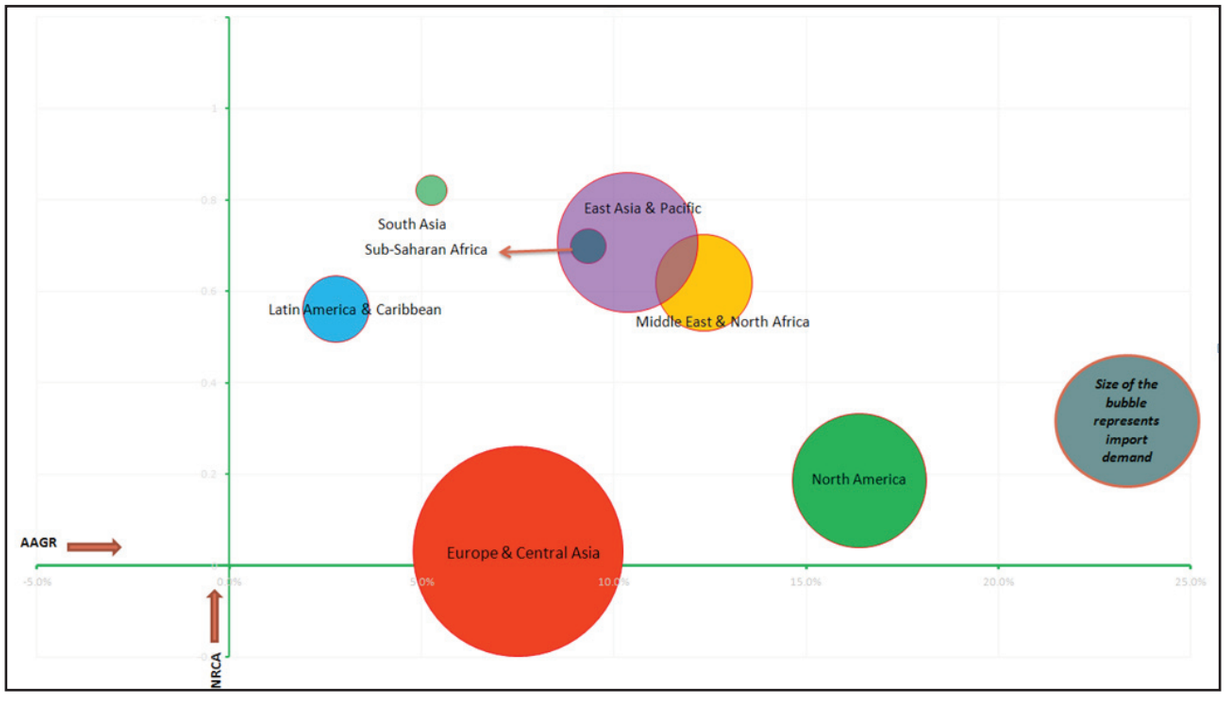
India's exports are competitive in all the markets at an aggregate level, with the maximum competitiveness exhibited in the region of South Asia, followed by East Asia and Pacific, and Sub-Saharan Africa. In spite of having significant competitiveness, India's exports to countries in the South Asian region, most of which are India's neighbours, are expected to be constrained on account of strategic concerns.

Exports were least competitive in the region of Europe and Central Asia, where Indian defence exports had a NRCA of 0.03. India also has competitiveness in the North American market, but the NRCA is relatively low at 0.19 (Exhibit 23).

The region witnessing the least growth in import demand during 2010-2014 was Latin America and Caribbean, with an AAGR of 2.8 percent during the period. Cumulatively, the least value of imports during 2010-2014 were by the regions of South Asia (not incl. India) (US$ 8.3 bn) and Sub-Saharan Africa (US$ 10.9 bn) (Exhibit 23).

Of all the regions, the maximum prospects for enhancing exports are in the regions of East Asia and Pacific, and Middle East and North Africa, where Indian defence exports are competitive; imports have grown at a healthy pace; and value of imports have been significant.

Exhibit 23: Identification of Promising Markets for Defence Equipment Export from India



Source: UNCOMTRADE, EXIM Bank Analysis

DISAGGREGATE SIMULTANEOUS IDENTIFICATION OF MARKETS AND PRODUCTS

East Asia and Pacific

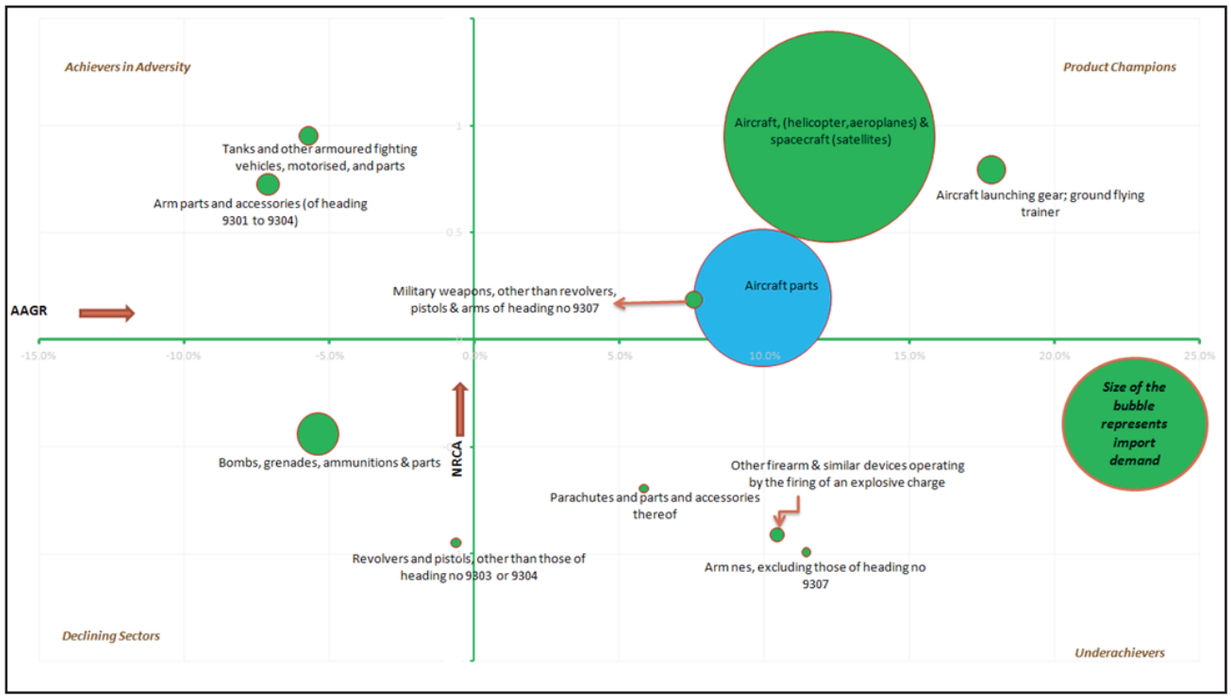
There are three product champions in case of East Asia and Pacific, indicative of competitiveness of India's exports in these categories, along with strong import demand from the region in the products, namely 'aircraft, (helicopter, aeroplanes) and spacecraft (satellites)'; 'aircraft launching gear; ground flying trainer', and 'Military weapons, other than revolvers, pistols and arms of heading no 9307' (Exhibit 24).

As far as aircraft (helicopter, aeroplanes) and spacecraft (satellites) are concerned, India was among the major suppliers for the top importing countries of China and Singapore. European and North American countries are among the top competitors for India in this product category. Among developing countries, China and Brazil are the top competitors for India (Table 26).

In the category of aircraft launching gear; ground flying trainer, India had a share of 14.5 percent in cumulative imports of Singapore during 2010-2014 (Table 26). Other than this, India did not have a major share in any of the top 5 importing countries.

The USA was a major import source for all the top five importing countries in the category of 'military weapons, other than revolvers, pistols and arms of heading number 9307', except Indonesia where Republic of Korea had the largest share. Republic of Korea is itself a major importer of this product, and India had a share of 9.4 percent in the country's cumulative imports during 2010-2014 (Table 26).

Exhibit 24: Product Matrix at Disaggregate Level for India's Exports to East Asia and Pacific



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 26: Top Importing Countries in East Asia and Pacific for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	China	6206.4	7395.3	8770.3	8233.7	10244.7	France (53.3), Germany (33.7), Brazil (5.7), Canada (3.1), **India** (1.3)
		Singapore	2256.4	1760.0	2276.7	2042.6	1140.4	France (62.3), The USA (10.7), Germany (8.6), **India** (6.4), Italy (3.0)
		Malaysia	998.5	1379.0	2695.0	2320.6	1958.9	France (88.0), Italy (4.7), Germany (1.9), Canada (1.4), Singapore (1.0)
		Rep. of Korea	786.4	2109.8	1229.0	1370.2	2457.9	France (69.5), The USA (13.5), Germany (11.0), Canada (1.7), China (1.3)
		Australia	1905.3	2657.3	1193.3	1156.1	720.9	France (69.6), Germany (7.4), Canada (6.7), The USA (3.7), Brazil (2.0)
8805	Aircraft launching gear; ground flying trainer	China	65.3	132.5	206.9	207.6	114.1	Canada (71.7), The Netherlands (8.4), Hong Kong (7.2), Singapore (3.8), Spain (3.4)
		Japan	48.3	8.4	39.3	67.7	54.9	Canada (49.3), The USA (32.1), Thailand (8.7), The Netherlands (4.0), Spain (3.2)
		Indonesia	31.7	30.7	45.1	47.1	37.9	Canada (52.8), The Netherlands (25.4), China (7.6), Singapore (7.3), The USA (4.7)
		Singapore	3.4	43.8	38.6	40.5	40.0	Canada (60.8), **India** (14.5), The USA (13.0), The Netherlands (4.5), France (2.7)
		Australia	9.8	18.6	25.2	79.4	27.3	Canada (58.1), The USA (28.7), Germany (4.6), Singapore (4.0), The Netherlands (2.3)
9301	Military weapons, other than revolvers, pistols and arms of heading no 9307	Indonesia	20.0	27.4	0.2	21.9	77.4	Rep. of Korea (58.0), Switzerland (39.4), The USA (1.3), Denmark (1.2)
		Malaysia	10.1	0.1	50.0	62.4	7.5	The USA (95.2), Turkey (4.7)
		Rep. of Korea	43.0	22.8	34.7	9.5	3.7	The USA (90.2), **India** (9.4), Cambodia (0.1), Canada (0.1), Hong Kong (0.1)
		Australia	3.0	53.3	15.3	14.8	8.2	The USA (95.9), Denmark (0.9), Israel (0.7), Japan (0.7), Indonesia (0.5)
		Thailand	3.1	16.4	57.2	4.7	2.8	The USA (85.4), Israel (14.2), New Zealand (0.1), Philippines (0.1), The Netherlands (0.1)

Source: UNCOMTRADE, EXIM Bank Research

Europe and Central Asia

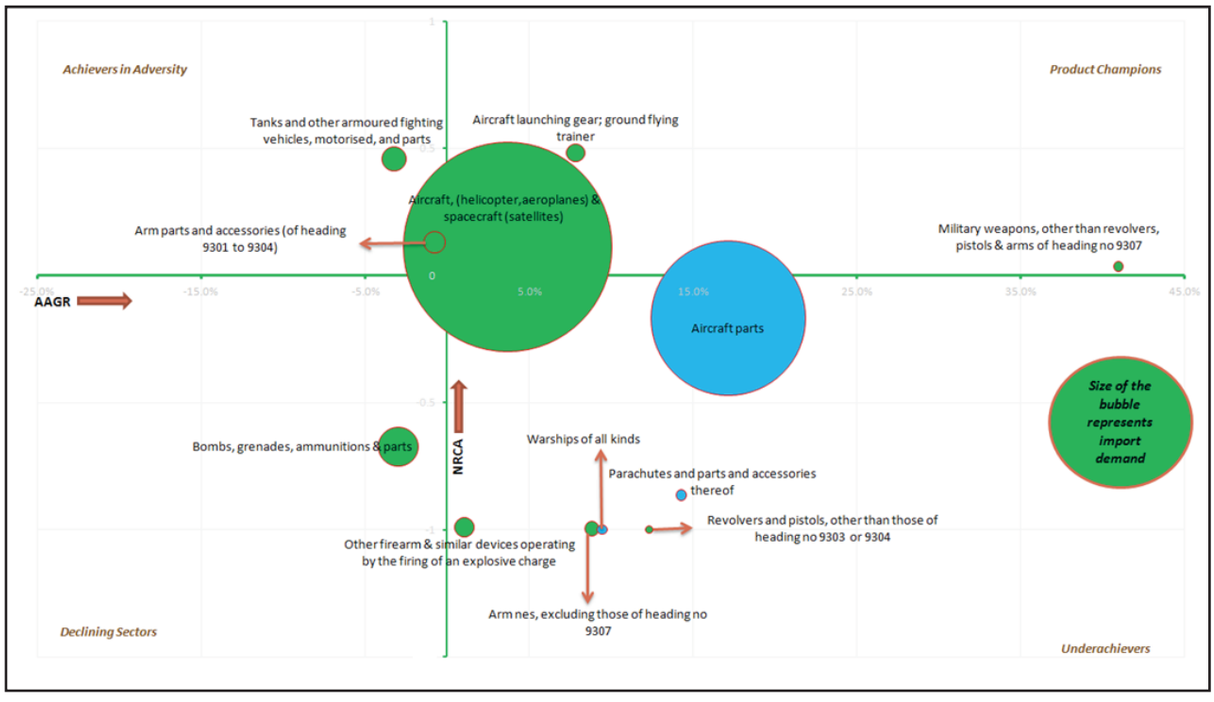
'Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)', 'aircraft launching gear; ground flying trainer', and 'military weapons, other than revolvers, pistols and arms of heading number 9307' are the product champions for Indian defence exports in Europe and Central Asia (Exhibit 25).

The top five importers of aircraft (helicopter, aeroplanes) and spacecraft (satellites) largely sourced their imports from European countries. India accounted for a mere 0.3 percent of the total imports by France during 2010-2014, and did not feature among the major suppliers for any other top five importing countries in this category (Table 27). Brazil had a significant share in several markets, attributable to the success of the Embraer aircrafts.

In the case of aircraft launching gear; ground flying trainer, India had significant shares of 4.2 percent and 5.2 percent in the top two importing markets of France and the United Kingdom (Table 27). No other developing country featured among the major suppliers of the top five importing countries.

India did not feature among the major countries exporting to the top five markets for military weapons, other than revolvers, pistols and arms of heading number 9307. Developing countries of Asia such as Thailand and Malaysia featured among the major suppliers in this product category (Table 27).

Exhibit 25: Product Matrix at Disaggregate Level for India's Exports to Europe and Central Asia



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 27: Top Importing Countries in Europe and Central Asia for the Product Champion Categories, and their Major Suppliers

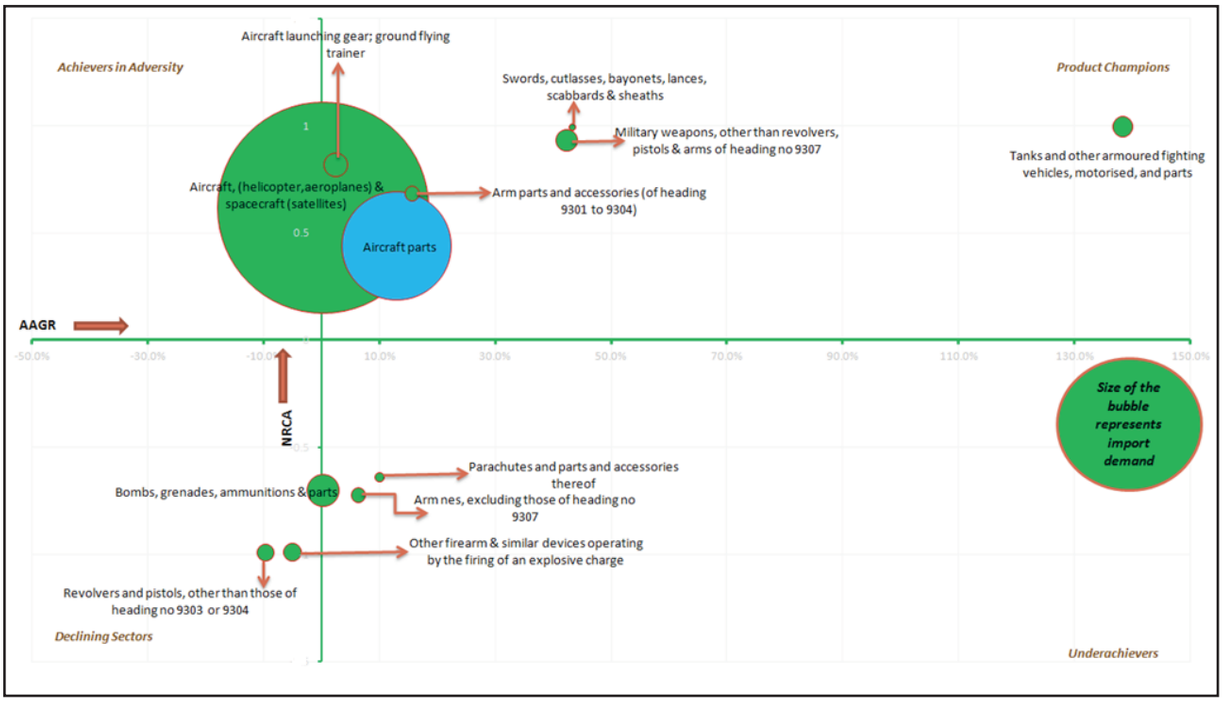
HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	Germany	13901.2	14457.9	15439.2	15426.1	16126.3	France (94.9), Canada (1.4), Brazil (1.2), Austria (0.6), Belgium (0.5)
		France	11310.8	14746.0	16805.6	15719.5	14115.7	Germany (94.1), The USA (1.8), Spain (0.8), Canada (0.7), **India** (0.3)
		The United Kingdom	3022.0	2837.6	3680.4	4277.1	4713.4	France (34.5), Germany (23.9), Canada (12.6), Spain (9.3), Brazil (5.6)
		Russia	1855.4	2010.4	2904.5	2323.6	1953.3	France (55.8), Germany (20.9), Canada (3.5), Italy (3), Ukraine (2.6)
		Spain	1760.7	1555.5	1026.2	2472.5	1949.1	France (61.7), Germany (15.9), Argentina (6.3), Brazil (4.8), Canada (4.8)
8805	Aircraft launching gear; ground flying trainer	France	16.9	90.8	47.0	162.3	81.4	The USA (47.3), Canada (17.1), The Netherlands (12.0), Germany (10.1), **India** (4.2)
		The United Kingdom	49.9	55.8	91.1	48.3	84.9	Canada (40.2), The USA (19.9), The Netherlands (11.0), Spain (5.7), **India** (5.2)
		Germany	45.0	38.5	52.2	44.3	36.8	Canada (39.8), The USA (27.7), Switzerland (10.4), Italy (8.3), The Netherlands (3.7)
		Italy	7.3	86.4	41.2	26.2	12.3	Canada (45.6), Germany (29.8), The USA (10), France (6.4), Austria (3.3)
		Russia	10.5	25.1	58.5	42.3	16.5	The USA (27.2), The Netherlands (26.9), Canada (26.3), France (6.9), Austria (6.2)
9301	Military weapons, other than revolvers, pistols and arms of heading no 9307	The Netherlands	7.4	0.1	0.5	4.3	58.4	The USA (97.7), Canada (1.0), Switzerland (0.9), Denmark (0.4), Norway (0.1)
		The United Kingdom	16.2	5.5	6.1	6.9	33.1	The USA (76.8), Poland (11.9), Canada (5.1), the Netherlands (2.3), Switzerland (0.7)
		Germany	0.7	11.6	28.6	2.6	22.7	Switzerland (50.9), The USA (27.7), Israel (10), Poland (6.9), Thailand (1.6)
		Austria	15.4	16.0	0.3	1.7	0.4	Israel (92.4), Slovakia (3), Malaysia (1.7), Switzerland (1.0), Australia (0.6)
		Turkey	4.7	0.2	1.3	15.7	9.1	The USA (79.3), Rep. of Korea (10.4), Switzerland (8.1), Norway (1.8), Israel (0.3)

Source: UNCOMTRADE, EXIM Bank Research

Latin America and Caribbean

With respect to Latin America and Caribbean, India has competitive advantage in seven defence products, and in six of these, India's competitiveness has increased over 2010-2014 (Exhibit 26). However, India's success in accessing the market has been fairly inadequate. India was not a major supplier to any of the top five countries importing tanks and other armoured fighting vehicles, motorised and parts. In the category of swords, cutlasses, bayonets, lances, scabbards & sheaths, India had a share of 12.3 percent in the market of Colombia. India also had a share of 3.3 percent in the arms parts and accessories (of heading 9301 to 9304) imports of Argentina. However, India was not among the top suppliers to any other major importing country in any of the product champion categories (Table 28).

Exhibit 26: Product Matrix at Disaggregate Level for India's Exports to Latin America and Caribbean



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 28: Top Importing Countries in Latin America and Caribbean for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
9307	Swords, cutlasses, bayonets, lances, scabbards & sheaths	Venezuela	0.6	1.3	1.2	4.3	2.7	Germany (98.1), Russia (1.4), China (0.2), The USA (0.2), Spain (0.1)
		Colombia	0.8	0.2	4.8	1.9	0.5	The USA (49.0), Spain (30.8), **India** (12.3), Germany (4.7), Argentina (3.0)
		Chile	0.4	0.4	0.7	0.6	0.6	Germany (86.9), The USA (7.0), China (4.8), Spain (0.8), Argentina (0.2)
		Mexico	0.1	0.2	0.1	0.2	0.9	The USA (74.5), China (9.6), Germany (8.3), Japan (3.9), Spain (3.2)
		Brazil	0.2	0.1	0.2	0.0	0.3	China (88.5), The USA (10.3), Japan (0.7), Spain (0.2), France (0.2)
8710	Tanks and other armoured fighting vehicles, motorised, and parts	Colombia	1.3	0.1	0.7	2.9	97.2	Canada (70.8), The USA (29), South Africa (0.1), The Netherlands (0.1)
		Mexico	4.9	39.6	24.3	0.9	2.7	The USA (99.9), Israel (0.1)
		Brazil	9.8	13.3	14.0	13.2	11.7	Switzerland (76.7), The USA (17.3), South Africa (2.5), Australia (2), Canada (0.8)
		Chile	1.2	1.8	10.8	3.5	4.6	The USA (89.5), Thailand (5.8), Denmark (2.2), Canada (1.4), Switzerland (0.9)
		Argentina	0.3	0.2	0.1	2.6	4.1	The USA (99.2), South Africa (0.8)
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	Brazil	1423.1	1528.8	1649.2	1567.7	1466.0	France (42), Germany (34.4), Argentina (6), The USA (4.1), Italy (3.7)
		Mexico	931.1	1007.7	1317.3	1103.1	1141.5	Germany (37.5), France (13.4), Brazil (11.8), Spain (10.4), Italy (9.9)
		Chile	886.4	1373.6	860.7	958.5	529.9	Germany (63.5), Argentina (13.5), France (11.7), Spain (3.1), The Netherlands (2.8)
		Colombia	462.0	646.9	668.2	1087.6	1214.8	France (64.1), Germany (22.7), The USA (6), Spain (2.7), Israel (1.3)
		El Salvador	151.0	445.3	329.7	140.7	198.8	Germany (45.4), Colombia (27.5), France (13.4), Brazil (10.5), Cyprus (2.6)
8805	Aircraft launching gear; ground flying trainer	Brazil	36.2	9.0	44.0	12.7	12.5	Canada (48.6), The Netherlands (16.9), The USA (12.2), UAE (8.4), Belgium (8)
		Colombia	1.7	4.2	17.3	33.6	3.1	The USA (60.1), France (19), Ecuador (15.5), Canada (2.7), The Netherlands (1.5)
		Chile	14.2	5.4	4.8	8.7	22.2	Canada (39.7), The USA (25.3), Italy (16.2), Spain (10.7), Brazil (6.3)
		Mexico	10.2	21.4	4.5	2.2	3.8	Canada (56.3), The USA (18.3), Australia (14.9), The Netherlands (7.1), Germany (2.1)
		Peru	0.7	1.7	12.7	5.2	2.3	Canada (52), The USA (27.4), Chile (15.5), Rep. of Korea (3.3), France (1)

9301	Military weapons, other than revolvers, pistols and arms of heading no 9307	Colombia	58.8	26.8	8.7	4.6	33.9	The USA (84.2), Rep. of Korea (15.2), Israel (0.4), Canada (0.2)
		Mexico	16.3	9.6	12.2	11.3	18.0	The USA (93.3), Rep. of Korea (3.7), Switzerland (1.9), Israel (1.1)
		Chile	1.2	3.1	51.8	1.3	4.0	Norway (83.8), The USA (15.8), Israel (0.3)
		Brazil	5.6	3.8	0.2	0.7	8.4	The USA (53.1), Chile (31.3), Israel (15.2), Indonesia (0.2), Canada (0.1)
		Panama	0.2	0.2	1.9	1.4	2.8	The USA (99.9), Colombia (0.1)
9305	Arm parts and accessories (of heading 9301 to 9304)	Mexico	7.4	10.6	18.3	12.9	6.2	The USA (94.9), Italy (1.9), Czech Rep. (1), The United Kingdom (0.7), Germany (0.5)
		Colombia	6.1	6.8	8.6	3.3	11.2	The USA (66.6), Rep. of Korea (14.7), Israel (13.8), Spain (4.2), Canada (0.3)
		Brazil	2.8	2.2	3.2	2.8	3.1	The USA (46), Switzerland (12.7), Sweden (7.9), The United Kingdom (7.8), China (6.1)
		Argentina	0.8	1.1	0.7	0.6	3.8	The USA (45.3), Spain (27.8), Switzerland (6.9), Italy (6.2), **India** (3.3)
		Chile	0.9	0.4	0.5	1.5	2.9	The USA (62.1), The United Kingdom (15.9), Switzerland (7.6), Germany (5), the Netherlands (2.1)

Source: UNCOMTRADE, EXIM Bank Research

Middle East and North Africa

The product categories of 'tanks and other armoured fighting vehicles, motorised, and parts', 'aircraft, (helicopter, aeroplanes) and spacecraft (satellites)', 'aircraft launching gear; ground flying trainer', 'military weapons, other than revolvers, pistols and arms of heading number 9307' and 'bombs, grenades, ammunitions and parts' are the product champions in this region (Exhibit 27).

India did not feature among the major suppliers for any of the top five countries importing tanks and other armoured fighting vehicles, motorised and parts. North American countries are the largest import source for all of the top five importing countries in the region (Table 30).

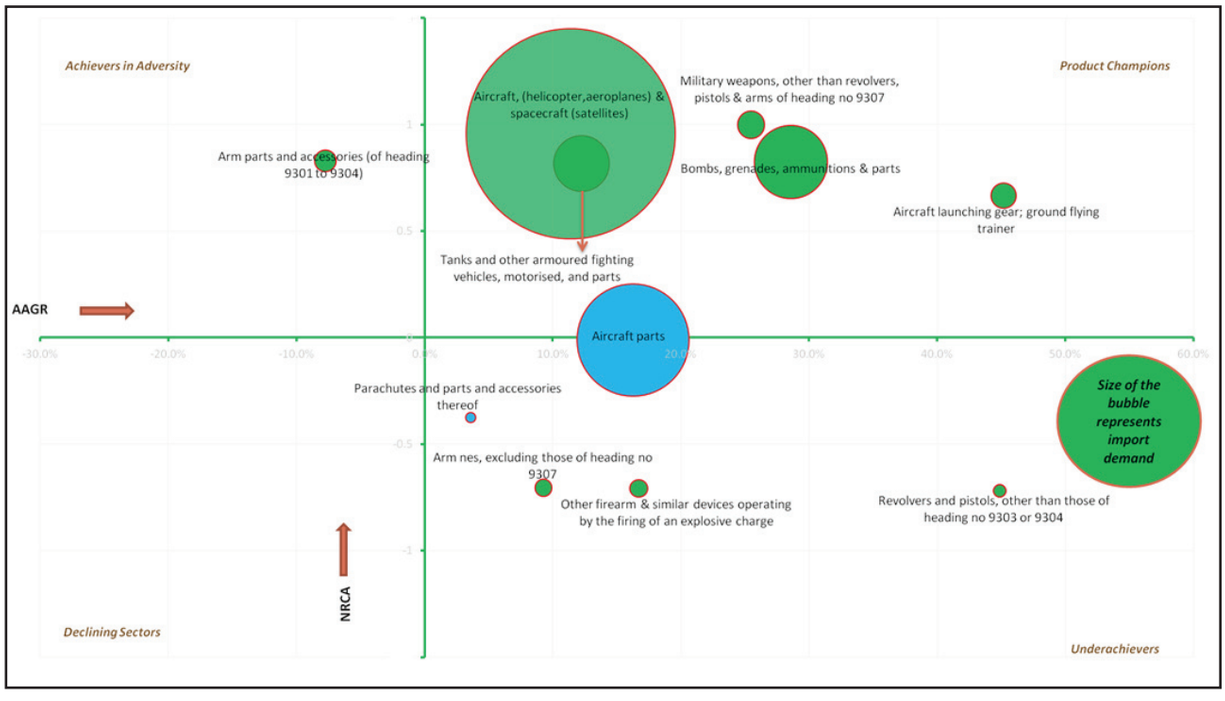
India is one of the largest suppliers of aircraft (helicopter, aeroplanes) and spacecraft (satellites) to UAE, accounting for 7.8 percent of the total imports of these products by the country. Germany and France are among the top suppliers of this product to the region. Other than India, Brazil is a major developing country which is a supplier of defence products to the region (Table 30).

In the case of aircraft launching gear; ground flying trainer, India had a share of 3.3 percent in the top importing market of UAE. Singapore was one of the major suppliers to Qatar in this product category. Singapore in turn has India as its second largest import source in this product category (Table 30). India also had a marginal share of 0.3 percent in the market of Bahrain (Table 30).

India also did not feature among the major suppliers for imports of military weapons, other than revolvers, pistols and arms of heading number 9307 by the top importing countries in the region. Asian economies of Republic of Korea, UAE, Pakistan and Thailand were among the major suppliers of this product to the region (Table 29).

Israel imported nearly 1.7 percent of bombs, grenades, ammunitions and parts from India during 2010-2014, with Spain, Poland, and Brazil being some of the main competitors in the market. USA was the largest import source for these products in case of all the top five importing countries (Table 29).

Exhibit 27: Product Matrix at Disaggregate Level for India's Exports to Middle East and North Africa



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 29: Top Importing Countries in Middle East and North Africa for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8710	Tanks and other armoured fighting vehicles, motorised, and parts	Saudi Arabia	26.2	40.0	502.8	305.4	453.3	Canada (57.1), The USA (42.5), South Africa (0.2), Mexico (0.1), Slovakia (0.1)
		Egypt	367.7	221.9	41.2	78.3	56.6	The USA (94.2), Slovakia (5.5), Poland (0.3)
		Israel	144.9	119.3	107.1	126.3	116.6	The USA (93.7), Romania (5.2), Slovakia (0.7), Finland (0.2), Australia (0.1)
		United Arab Emirates	8.8	44.2	169.0	288.0	40.1	The USA (77.3), South Africa (17.6), Qatar (1.8), Canada (1.0), Australia (0.9)
		Kuwait	28.0	33.1	11.4	3.4	4.8	The USA (85.5), South Africa (10.8), Canada (2.5), Poland (1.1)
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	United Arab Emirates	3503.4	2986.8	4646.0	6258.0	7078.7	Germany (61.2), France (16.6), **India** (7.8), The USA (4.9), Spain (3.3)
		Saudi Arabia	2839.5	1451.7	569.1	1833.8	3061.9	France (34.7), Germany (14.2), The USA (12.4), Spain (10.3), The United Kingdom (10.3)
		Qatar	676.6	964.1	1152.6	437.5	2062.1	France (46.2), Germany (22.2), The USA (15.1), Italy (10.9), Switzerland (2.4)
		Kuwait	301.8	21.4	57.8	561.2	820.8	France (48.2), The USA (36.6), Germany (14.9), Canada (0.4)
		Oman	286.0	326.8	215.2	403.0	524.6	France (57.4), The USA (13.9), Brazil (9.8), Spain (8.8), Germany (5.2)
8805	Aircraft launching gear; ground flying trainer	United Arab Emirates	27.3	97.7	65.4	72.4	92.6	Canada (63.7), The USA (12.6), Switzerland (11.6), Germany (5.2), **India** (3.3)
		Saudi Arabia	32.3	3.9	3.8	10.5	86.6	The USA (36.2), Germany (22.2), Canada (22), Switzerland (13.8), Austria (4.8)
		Qatar	1.1	0.8	3.4	14.2	57.4	Switzerland (46.7), Canada (23.1), Germany (14.4), The USA (10.2), Singapore (1.9)
		Bahrain	9.3	24.3	10.6	2.5	2.8	Canada (60.9), The USA (27.9), The Netherlands (9.4), Germany (0.9), **India** (0.3)
		Iraq	7.7	31.3	0.8	0.0	0.3	The USA (63.8), Germany (29.6), Slovakia (5.2), Italy (0.5), UAE (0.5)

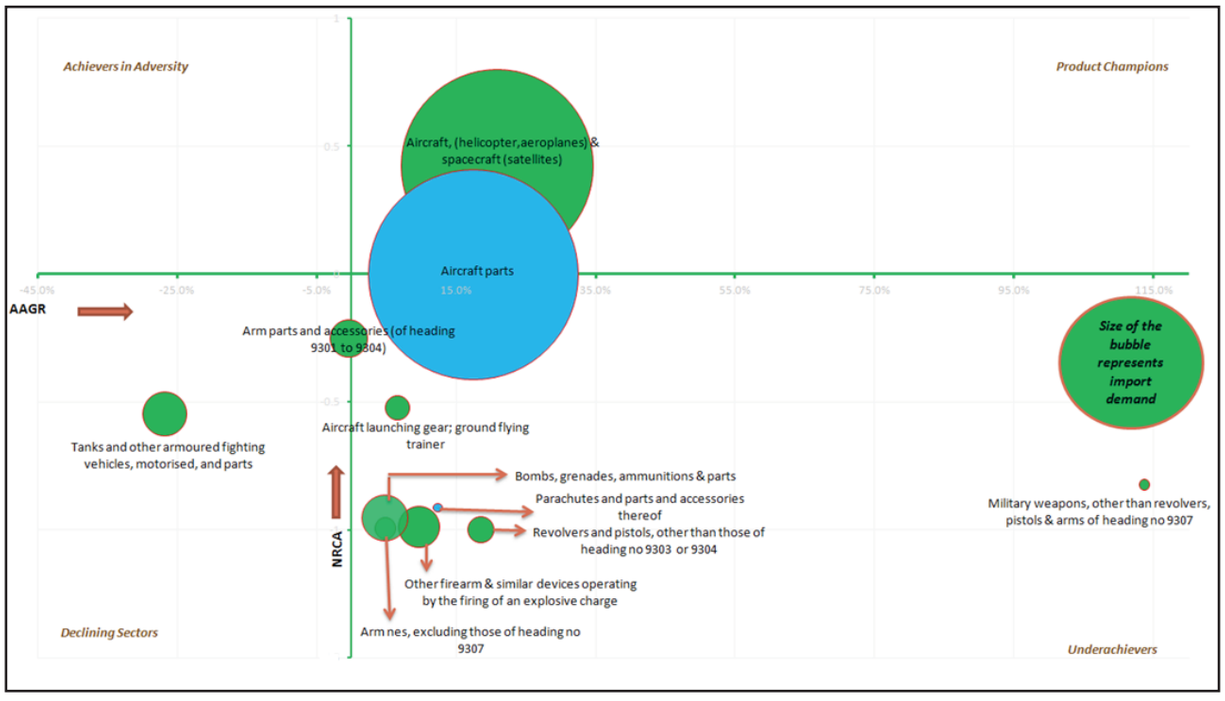
9301	Military weapons, other than revolvers, pistols and arms of heading no 9307	Iraq	4.0	111.2	31.2	2.0	35.0	The USA (82.7), Rep. of Korea (14.1), Poland (1.9), Croatia (1.1), Slovakia (0.2)
		Saudi Arabia	13.4	13.8	5.4	75.6	68.6	The USA (94.1), Slovakia (2.9), Croatia (1.8), Pakistan (1.0), UAE (0.1)
		United Arab Emirates	2.8	29.0	46.7	78.7	12.0	The USA (90.0), Finland (8.8), The Netherlands (0.8), Slovakia (0.3)
		Jordan	10.9	34.5	15.9	24.6	17.2	The USA (85.0), Croatia (10.1), Cote d'Ivoire (3.9), The Netherlands (0.6), Switzerland (0.2)
		Israel	8.5	3.0	13.0	11.6	48.3	The USA (98.9), Poland (0.6), Australia (0.2), Thailand (0.1), Rep. of Korea (0.1)
9306	Bombs, grenades, ammunitions and parts	United Arab Emirates	295.8	337.1	702.9	1022.4	358.5	The USA (93.4), Brazil (1.6), Italy (1.4), Rep. of Korea (1.1), Switzerland (0.9)
		Saudi Arabia	69.8	186.2	269.5	335.2	639.6	The USA (82.2), Rep. of Korea (5.6), The United Kingdom (2.9), Croatia (2.5), Italy (1.1)
		Israel	155.7	99.5	106.7	85.2	192.1	The USA (87.1), Spain (3.6), **India** (1.7), Poland (1.4), Brazil (1.4)
		Kuwait	64.1	95.0	121.0	44.2	223.0	The USA (90.8), Italy (3.9), Cyprus (1.7), Germany (1.4), Greece (0.4)
		Egypt	28.5	24.1	136.7	81.9	90.7	The USA (82.9), Slovakia (6.0), Montenegro (3.2), Russia (2.8), Turkey (1.1)

Source: UNCOMTRADE, EXIM Bank Research

North America

There was only one product champion among India's exports of defence products to North America, i.e. aircraft, (helicopter, aeroplanes) and spacecraft (satellites) (Exhibit 28). India is not among the major suppliers in the top importing markets of the region. Brazil had a significant presence in the USA market for this product, with a share of 8.3 percent (Table 30).

Exhibit 28: Product Matrix at Disaggregate Level for India's Exports to North America



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 30: Top Importing Countries in North America for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	USA	7956.5	11063.1	11644.6	14118.4	17092.6	France (28.9), Canada (27.6), Germany (16.1), Brazil (8.3), Italy (2.3)
		Canada	487.3	750.4	452.8	530.6	607.0	The USA (34.6), Belgium (16.4), France (7.9), Germany (7.1), Spain (5.3)
		Bermuda	51.7	81.2	0.0	32.7	98.5	South Africa (22.1), France (18.9), Canada (18.0), The United Kingdom (16.0), Spain (12.4)

Source: UNCOMTRADE, EXIM Bank Research

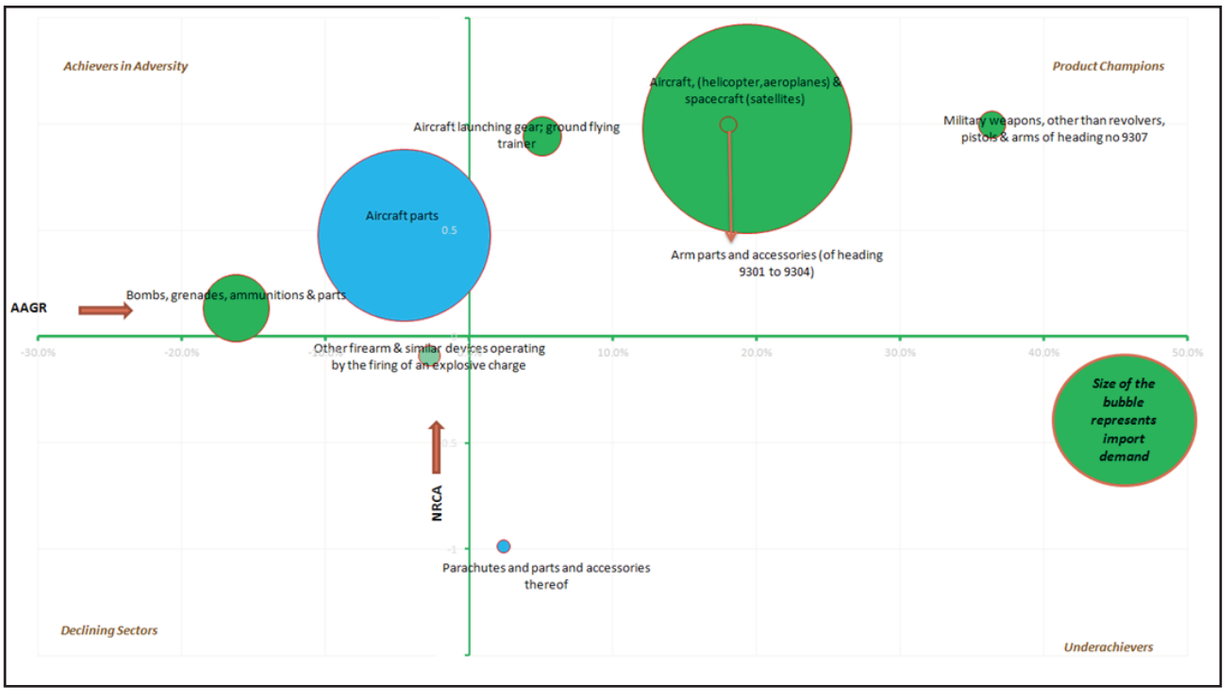
South Asia (Not incl. India)

The product categories of 'aircraft, (helicopter, aeroplanes) and spacecraft (satellites)', 'military weapons, other than revolvers, pistols and arms of heading no 9307', 'aircraft launching gear; ground flying trainer', and 'arms parts and accessories (of heading 9301 to 9304)' are the product champions in this region (Exhibit 29).

India is the largest supplier of 'aircraft (helicopter, aeroplanes) and spacecraft (satellites)' to Sri Lanka, with a share of 83.7 percent in the total imports of these products by the country. However, other top importing countries did not have India as a major import source. India was also the largest import source for Nepal's imports of arm parts and accessories (of heading 9301 to 9304), accounting for 41.6 percent of the cumulative imports by the country during 2010-2014 (Table 31).

Afghanistan is the largest importer of 'military weapons, other than revolvers, pistols and arms of heading number 9307' in the region. China was the largest import source for Afghanistan, with a share of 33.6 percent. Exports from the USA have significant share in several other markets such as Pakistan, Bangladesh and Maldives (Table 31).

Exhibit 29: Product Matrix at Disaggregate Level for India's Exports to South Asia (Not incl. India)



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 31: Top Importing Countries in South Asia (Not Incl. India) for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ '000)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	Sri Lanka	95.0	186525.2	60498.8	883299.6	2235601.4	**India** (83.7), France (15.0), China (0.9), UAE (0.2), Vietnam (0.2)
		Pakistan	236690.8	134957.1	23872.8	109462.6	101389.6	Sweden (43.3), France (27.7), Ukraine (9.1), Germany (3.9), Canada (3.7)
		Afghanistan	90787.6	11398.1	47394.6	1764.1	4017.2	UAE (32.9), Canada (17.5), The USA (13.8), Slovakia (12.1), Lithuania (7.7)
		Bangladesh	22550.9	48083.6	12899.2	53384.5	14736.7	Germany (31.4), Italy (17.1), Cote d'Ivoire (10.3), Lithuania (8.9), the Netherlands (8.7)
		Maldives	3320.0	9701.6	7887.1	34929.7	28027.9	France (41.6), Spain (25.9), Italy (11.6), Germany (9.4), Canada (7.5)
9301	Military weapons, other than revolvers, pistols and arms of heading no 9307	Afghanistan	23946.1	20541.8	7184.7	2387.8	10021.9	China (33.6), Singapore (21.4), France (21.4), Spain (11.5), Czech Republic (7.7)
		Pakistan	1941.1	111.5	30.7	119.1	7925.0	The USA (97.0), Croatia (1.6), Poland (1.3), UAE (0.1)
		Bangladesh	166.5	171.4	61.3	216.0	1350.1	The USA (99.9)
		Maldives	0.0	157.8	14.6	0.0	0.0	The USA (100.0)
		Sri Lanka	0.0	0.0	0.0	1.5	0.0	Kenya (100.0)
8805	Aircraft launching gear; ground flying trainer	Afghanistan	16228.8	14198.2	21069.9	7244.4	2217.0	The USA (73.2), Slovakia (17.3), UAE (6.4), Romania (2.9), Czech Republic (0.1)
		Pakistan	30779.1	17108.8	4712.9	1400.8	4402.8	Turkey (46.6), Spain (27.4), the USA (17.7), France (3.9), Singapore (3.7)
		Sri Lanka	985.0	11915.4	129.2	11381.0	175.1	The Netherlands (94.8), UAE (2.3), Singapore (1.9), Canada (0.9), The USA (0.1)
		Bangladesh	2163.3	895.4	579.1	921.0	290.2	Singapore (58.5), France (33.8), Czech Republic (5.9), UAE (1.4), The USA (0.3)
		Nepal	1214.3	0.0	40.6	36.1	51.3	The USA (92.6), Singapore (5.8), Australia (1.6)

9305	Arm parts and accessories (of heading 9301 to 9304)	Afghanistan	9591.1	5719.0	3336.0	3624.1	4495.1	The USA (90.3), The UK (3.8), Poland (1.8), Rep. of Korea (1.6), Czech Republic (0.8)
		Pakistan	6173.2	3287.2	2626.9	2217.6	1068.4	The USA (58.1), Turkey (17.0), Switzerland (12.8), France (5.0), Luxembourg (2.9)
		Bangladesh	3379.0	2383.0	473.6	1258.1	2930.8	China (53.7), The USA (21.4), Tthe UK (6.9), Italy (5.9), Germany (5.8)
		Sri Lanka	18.9	32.6	179.3	25.2	349.9	Germany (21.8), The UK (21.7), Malta (19.0). Philippines (9.0), China (8.2)
		Nepal	20.1	7.5	15.4	86.1	94.5	**India** (41.6), The USA (24.2), China (20.3), Czech Republic (13.3), Germany (0.4)

Source: UNCOMTRADE, EXIM Bank Research

Sub-Saharan Africa

The product categories of 'aircraft, (helicopter, aeroplanes) and spacecraft (satellites)', 'aircraft launching gear; ground flying trainer', 'arm parts and accessories (of heading 9301 to 9304)' and 'bombs, grenades, ammunitions and parts' are the product champions in this region (Exhibit 30).

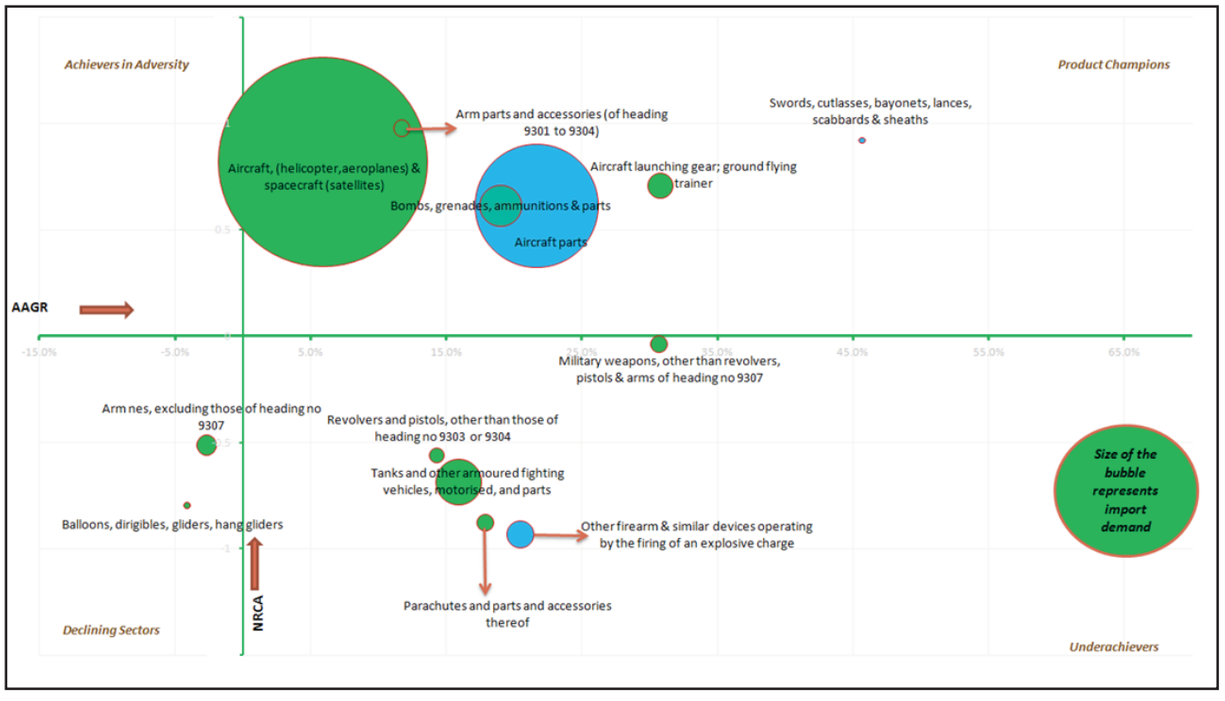
India was one of the major suppliers of aircraft launching gear; ground flying trainer to Botswana, accounting for 6.1 percent of the imports by the country. India also accounted for 2.2 percent of Botswana's imports of bombs, grenades, ammunitions and parts (Table 32). Other than Botswana, India's export success has been limited in the top importing countries of this region.

IN SUM

Aircraft parts account for a major share of the global import demand for defence equipment. However, India's competitiveness in this category has declined over the period under consideration. Hence, exporters need to focus in augmenting capacities and enhancing technical capabilities under this segment.

Another major import category is that of aircraft (helicopter, aeroplanes) and spacecraft (satellites). Most of the major suppliers in this category are developed countries. However, Brazil has been able to tap the potential in this sector and best practices of Brazil in this sector can be suitably adapted in the Indian case to promote exports from this sector.

Exhibit 30: Product Matrix at Disaggregate Level for India's Exports to Sub-Saharan Africa



Note: Colour of the bubble represents increase or decrease in NRCA values during 2010-2014 period (Blue represents decrease; Green represents increase). A product category is a product champion only if the NRCA has remained same or increased, in the period under consideration. Else, it is a pseudo-product champion.
Only those product categories have been considered which comprise at least 0.1 percent of the total defence imports of the region, and for which values of NRCA and AAGR could be derived.

Source: UNCOMTRADE, EXIM Bank Research

Table 32: Top Importing Countries in Sub-Saharan Africa for the Product Champion Categories, and their Major Suppliers

HS Code	Product Champion Categories	Top Importing Countries	Value of Imports (US$ mn)					Major Suppliers (data in parentheses indicates share in the country's imports cumulatively during 2010-2014)
			2010	2011	2012	2013	2014	
8802	Aircraft, (helicopter, aeroplanes) and spacecraft (satellites)	South Africa	185.3	801.5	392.3	215.8	515.0	France (70.8), Canada (4.3), Germany (3.4), Botswana (3), Switzerland (2.5)
		Nigeria	238.7	70.1	163.1	89.0	356.6	Canada (27.1), Italy (23.2), The United Kingdom (21.2), France (13.3), Brazil (3.7)
		Kenya	120.1	140.3	239.6	209.1	29.9	Brazil (66.6), Finland (6.8), South Africa (5.4), Germany (3.3), Canada (3.1)
		Angola	178.5	147.3	83.1	85.5	120.8	France (46.6), Canada (32.6), Brazil (13.8), South Africa (3.4), Tanzania (2.1)
		Namibia	24.8	20.9	79.4	288.8	26.1	France (52.5), Germany (25.5), South Africa (17.9), Tanzania (3.1), Israel (0.4)
8805	Aircraft launching gear; ground flying trainer	South Africa	11.4	5.5	15.0	4.6	3.3	Canada (27.5), The Netherlands (26.3), France (17.1), Switzerland (13.8), Sweden (8)
		Ethiopia	0.5	2.3	1.6	8.1	22.1	Canada (86.3), Slovakia (4.1), The Netherlands (3.4), Germany (1.6), UAE (1.5)
		Kenya	6.5	0.1	0.1	1.0	0.3	Canada (83.8), The Netherlands (10.7), The USA (3.8), Mali (0.6), South Africa (0.5)
		Botswana	0.0	0.3	0.4	0.6	6.4	Switzerland (82), South Africa (11.5), **India** (6.1), Spain (0.3)
		Nigeria	1.7	1.5	0.6	0.6	0.3	The USA (64.4), France (13.9), Switzerland (6.9), Norway (4.7), South Africa (3.9)

9305	Arm parts and accessories (of heading 9301 to 9304)	South Africa	3.1	7.2	6.1	5.3	7.3	The USA (29.3), Australia (16.9), Germany (10.6), Switzerland (6.1), Sweden (5.7)
		Mauritius	0.0	0.7	1.1	0.1	0.1	Malta (90.8), The United Kingdom (4.7), The USA (1.3), France (1.1), Austria (1)
		Nigeria	1.0	0.4	0.2	0.1	0.0	Israel (70), The USA (22.7), Turkey (6.2), Germany (0.8), China (0.2)
		Chad	0.9	0.0	0.1	0.1	0.0	Namibia (76.5), The USA (15.9), France (5), Malta (2.5)
		Kenya	0.2	0.2	0.1	0.4	0.1	The USA (63.3), The United Kingdom (13.5), Turkey (4.8), Czech Rep. (4.7), Austria (4.4)
9306	Bombs, grenades, ammunitions and parts	South Africa	9.3	24.8	9.9	13.4	17.3	The USA (30.3), Malawi (20.2), The United Kingdom (8.5), Spain (7.3), Italy (5.5)
		Mali	4.2	9.0	6.2	8.7	6.8	France (37.9), Turkey (32), Poland (10.8), Spain (10.6), Italy (7.1)
		Botswana	1.2	0.4	1.0	19.3	0.6	Namibia (94.1), Germany (2.3), **India** (2.2), Spain (0.4), The United Kingdom (0.3)
		Congo	3.5	4.4	5.3	4.4	4.0	France (73.3), Italy (26.4), Israel (0.2)
		Cameroon	3.1	2.7	2.3	4.2	3.6	France (34.4), Italy (29.3), Spain (25.1), Serbia (4.5), Czech Rep. (3.3)

Source: UNCOMTRADE, EXIM Bank Research

6. Enhancing Defence Exports : Select Options

Due to various reasons, including capacity constraints and inadequate technological capabilities, Indian defence equipment suppliers are unable to secure greater share in the global market. Development of a strong defence manufacturing sector has the potential to position India as an attractive source country for global defence imports. Given the cost advantages which the country offers, multinational firms can engage in sourcing of defence equipment and services from the country if industrial capabilities are matched to those of international standards.

Apart from benefits in the form of greater export revenues, a robust manufacturing base will ensure self-reliance, provide large scale employment, and encourage creation of IP and dual-use technologies. Appropriate policy oriented, manufacturing related and promotional strategies need to be adopted by this sector to emerge as a leading player in both domestic and export markets. As in the case of several successful global defence manufacturers, ECA support can also help create global suppliers in India's defence sector.

I. POLICY ORIENTED STRATEGY

Revisions in Offset Policy

As discussed in Chapter 3, India has one of the highest threshold limits and the lowest offset percentage requirement, among some of the major defence equipment importers of the world. Moreover, according to Laxman Behra (2015), India also does not specify the exact way in which foreign vendors can discharge their offset obligations. As against this, Canada has a list of technologies on which vendors are required to invest at least 5 percent of their offset obligations. Turkey uses offsets for promotion of exports by specifying the export requirements in the tender document itself. India also does not have an implementation agency for effective management of offsets and their monitoring. On the other hand, countries such as Canada have a dedicated, single-window agency to manage offsets in all aspects, ranging from vetting offset proposals, to awarding offset credits to vendors and monitoring them[33].

Hence, the offset policy needs to be amended to direct offset obligations in critical areas which can be identified by the Ministry of Defence. The offset percentage requirements also need to be revised upwards, while threshold limits need to be revised downwards.

Special Priority Status to Defence Sector

The defence sector can also be placed on par with the infrastructure sector to ensure that serious defence players are able to secure long term finance at competitive pricing. Infrastructure sector in India has been a focus area for the Indian Government and there exists a strong incentive system, which includes tax holiday of ten years.

[33]Laxman Kumar Behra (2015), Defence Offsets: International Best Practices and Lessons for India, IDSA Monograph Series No. 45 June 2015

Such tax related incentives will be crucial for the growth of domestic defence industry.

Given the huge import dependence, the government could also consider according 'Deemed Export' status for the defence industry for a few years, extendable in future. 'Deemed Exports' refers to those transactions in which the goods supplied do not leave the country and the payment for such supplies is received either in Indian rupees or in free foreign exchange. Deemed exports are eligible for several benefits such as advance license, deemed export drawback and exemption/refund of terminal excise duty. Benefits of deemed export projects could be extended to defence projects. Supplies of inputs and capital goods to defence projects, especially those awarded through international competitive bidding could be granted refund of terminal excise duty. Such benefits could also be made available to Indian offset partners.

Membership in Non-Proliferation Regimes

There exist several multilateral non-proliferation export control regimes to combat the problems related to proliferation and export of weapons of mass destruction (WMD). These regimes are wide-ranging and endeavour to tackle the threats to security. The regimes focus on specific threats

Box 8: Non-Proliferation Regimes

The Australia Group – This framework ensures that likely proliferators are unable to get essential inputs for chemical and biological weapons by development of ways to reduce export and transshipping risks. Licensing authority over a broad range of chemical weapons precursors is one of the ways. Participating government require licenses for the export of dual-use chemical manufacturing facilities, equipment, and related technology, plant pathogens, animal pathogens, biological agents, and dual-use biological equipment. These items form the core of the Group's common control lists.

The Wassenaar Arrangement – This regime contributes towards regional and international security and stability by encouraging transparency and responsibility in transfers of conventional arms and sensitive dual-use goods and technologies. Members of the regime employ export controls on specific armaments and technologies. Export control guidelines prevent destabilizing accumulations of weapons and technologies in volatile regions.

Missile Technology Control Regime (MTCR) – The regime reduces the risk of the proliferation of WMD delivery systems through the adherence of common export policies and guidelines by participating governments. The aim of the MTCR is to limit the proliferation of missiles, complete rocket systems, unmanned air vehicles, and related technology for those systems capable of carrying a 500 kilogram payload at least 300 kilometers, as well as systems intended for the delivery of weapons of mass destruction. It attains its goals through export controls and licensing, relative information exchange among members, and outreach to non-members.

Nuclear Suppliers Group – The regime contributes to the non-proliferation of nuclear weapons through the implementation of guidelines for nuclear and related exports. Members have developed export guidelines, which aim to ensure that nuclear trade for peaceful purposes does not contribute to the proliferation of nuclear weapons or other nuclear explosive devices. These guidelines cover nuclear material, technology and equipment, which may be considered dual-use.

such as chemical and biological weapons (The Australia Group), nuclear weapons (Nuclear Suppliers Group), delivery systems (Missile Technology Control Regime), and conventional arms (The Wassenaar Arrangement) (Box 8). India is not a member of any of these groupings.

As India increases its capacity to export defence equipment, which might be sensitive in nature, it will be essential for the country to be in conformity with the major international non-proliferation regimes. The country also needs to set up export control systems in order to strengthen its case for becoming a member in these groupings. In order to facilitate this, domestic industries should be encouraged to adopt global best practices in export control and regulations.

II. MANUFACTURING RELATED STRATEGY

R&D Expenditure in Defence Sector

Critical technologies are offered only under the "Buy" category, and developments of these technologies are crucial for self-reliance and promotion of exports. Defence Research and Development Organization (DRDO) is the main defence R&D organization in the country. Beginning with a cluster of around 10 laboratories in 1958, DRDO currently has 46 laboratories at various locations in the country. The organization is mandated to provide assessment and advice on scientific aspects of weapons, platforms and surveillance sensors; to carry out research and to develop cutting edge technologies leading to production of state-of-the-art sensors, weapon systems, platforms and allied equipment for the country's defence services. In the recent past, the mandate has been widened to support national cyber security architecture which includes testing capabilities, security solutions, networking systems and cyber defence tools.

R&D expenditure in defence has registered an increase over the past two years, reaching a level of ₹ 15,282 cr in 2014-15. This accounted for nearly 6.7 percent of the total defence expenditure during 2014-15 (Table 33). As against this, the budget for Research, Development, Test and Evaluation (RDT&E) programme of the US Department of Defense - which supports the development of future military hardware - was about 11.3 percent of the defence budget in FY2015[34]. In the case of China as well, approximately 16 percent to 18 percent of the defence budget is spent on R&D expenditures[35]. Hence, there is a need for upward revisions in the defence R&D expenditures in the country. This will help in creation of Intellectual Property Rights within the Indian defence space, which in turn will help in increasing the competitiveness of the defence R&D resulting in state-of-art technologies and improvement in domestic defence production capabilities. This will also help Indian defence industry to tap overseas markets by production of innovative defence equipment.

R&D is usually divided into three main segments: basic research, applied research, and development. Basic research is research undertaken primarily to acquire new knowledge without taking into consideration the applicability of the results. On the other hand, applied research is directed towards a specific objective, and development is activity drawing on existing research results and directed specifically towards the creation of new and improved products and processes. For the defence sector to benefit from the research activities, applied research and development segments must receive a major share of the

[34]Ranjit Ghosh (2015), Defence Research and Development: International Approaches for Analysing the Indian Programme, IDSA Occasional Paper No. 41
[35]Ibid.

Table 33: Share of R&D Expenditure in Total Defence Expenditure (Values in ₹ Crore)

Year	Defence Expenditure	R&D Expenditure	R&D Expenditure as % of Defence Expenditure
2009-10	1,41,781.0	8,475.4	6.98
2010-11	1,54,117.0	10,148.9	6.59
2011-12	1,70,913.0	9,893.8	5.79
2012-13	1,81,776.0	9,794.8	5.39
2013-14	2,03,672.0	10,859.0	5.37
2014-15(BE)	2,29,000.0	15,282.9	6.67

BE- Budget Estimate
Source: "Ministry of Defence Demands For Grants (2014-15) for Ordnance Factories and DRDO" presented by the Standing Committee on Defence to Lok Sabha on December 22, 2015

expenditure on R&D. Industrial applicability of research work needs to become a major focus area. Currently, nearly 70 percent of India's R&D investment is dedicated to advanced research, and development as against 80 percent and 92 percent, respectively, in the case of the US and China[36].

Technology Development

Defence equipment manufacturing is a high technology and capital intensive industry. Globally, defence technology development which was earlier a prerogative of government research organizations are increasingly being carried out by commercial players. In the Indian case, technology transfers have not been satisfactory, leading to significant dependence on foreign manufacturers. The offset policy also does not put special emphasis on development of domestic technological capabilities. Moreover, several major defence exporters are wary of transferring technologies, thereby restricting India's access to new technologies by way of imports.

Under the current scenario, it will be essential to promote domestic technology development for self-reliance in domestic production. India has been successful in developing space and nuclear technologies, and an appropriate incentive system and innovation climate can nudge the defence sector on to a higher technological path.

DPSUs need to be encouraged to develop cluster of suppliers and incubate technology based companies. Handholding small suppliers and incentivising innovation in high risk areas through a cost-plus contract structure will be essential for propelling the defence industry on a higher growth path.

The 2005 report of the Kelkar Committee on review of Defence Procurement Procedure had recommended several policies for enhancing self-reliance in the defence sector. Among other recommendations, two Technology Development Funds were recommended - the Strategic Defence Industry Fund which was 'a non-lapsable pool of resources', especially for the 'Make' projects; and the Defence Technology Product Development Fund which was meant for the SME sector for undertaking design and development projects. The non-lapsable nature of these resources was

[36] 2014 R&D Magazine, Battelle Global R&D Funding Forecast

crucial for unhindered support to the domestic defence industry. However, these proposed funds never saw the light of the day. To achieve self sufficiency in the defence space, it may be worthwhile to reconsider these options.

Availability of Test Facilities

Private entities registered in India can avail of Government test facilities such as military ranges and laboratories for testing and evaluation purposes. Previously, private players sent their equipments abroad for testing purposes. While this is expected to drastically reduce the development cost of defence products, there is scope for creating a more enabling environment.

According to a report by ELCINA[37], the test labs available with government/ private establishments do not have complete range of test facilities under one roof. This necessitates movement of equipment to labs in different parts of the country. Moreover, these labs have fixed charges for each test and firms testing their systems are required to pay the test charges in advance. In case the test does not comply with the test conditions, the test would be conducted again after necessary modifications and after another fee payment.

Creation of new test facilities will be important in order to meet the demands of the private players. Public-private partnerships in some categories of defence equipment can help in management of cost and quality of the labs. Formation of an industry group with a forum specific to testing facilities can help in productive dialogues between relevant stakeholders for technology advancements. Moreover, provisions can be made for providing fundamental test facilities for measurement of physical and electrical parameters at one place so that equipment need not be transferred to various locations. Subsidies on test fees can also be provided to smaller manufacturers of defence components[38].

Skill Development

The defence industry requires highly skilled labour force. However, the current education and training structure does not adequately meet the requirements, thereby compromising the defence innovation climate in the country. In 2008, the report of the Rama Rao Committee for restructuring of DRDO had noted that only ten percent of the scientific manpower in DRDO had higher qualification of PhD, and majority of the workforce was not research trained. Moreover, according to National Skill Development Council, the aerospace industry alone will require an additional manpower of over 185,500 by 2022 in its R&D, manufacturing, and maintenance, repair and overhaul (MRO) segments[39]. Hence, it is essential to set up a dedicated Defence Technology University which could cater exclusively to the demands of the defence industry.

III. PROMOTIONAL SUGGESTIONS

Dedicated Body for Exports Promotion

In several countries such as Australia and Turkey, there are dedicated government offices which facilitate the overseas sales of indigenous defence equipment through government channels. On similar lines, a dedicated export promotion council can be created under the Ministry of Defence. This dedicated council could follow ongoing overseas defence tenders and provide the information to

[37]A Study Report on Test & Certification facilities for Defence Related Components and Products in India, ELCINA Electronic Industries Association of India, August 2013
[38]Ibid.
[39]Laxman K. Behra (2015), 'Make in India' for Defence: A Roadmap', Policy Brief, Institute for Defence Studies and Analyses

relevant Indian companies. It can also set up liaison offices in strategic geographies. The council can also participate in international defence fairs, for displaying Indian capabilities in the defence sector.

Strategic Partnership in Defence Space

Firms from the private sector can be identified and encouraged to develop and manufacture major defence equipment. This can be achieved through incentives like sharing of R&D expenses by the Government. Low cost finance can also be availed by these firms by establishing cooperation agreements with financial institution as in the case of countries such as Brazil and China. It is noteworthy that a similar recommendation was made by the Kelkar Committee (2005) in the form of "Raksha Udyog Ratna", but the plan was later scrapped by the Ministry of Defence.

The report of the committee of experts for amendment to DPP 2013 including formulation of policy framework, chaired by Mr. Dhirendra Singh has also suggested a strategic partnership model, under which a few big private players will be identified and nurtured through preferential treatment. These companies can be appointed for 'Buy and Make' and Government-to-Government procurement programmes. The strategic partnership model is yet to become a part of DPP-2016.

Australia's AIC program is similar to the proposed strategic partnership model, where in areas defined as 'Priority Industry Capabilities', long term contracts are assigned to a few vendors. Focused vendor landscape per critical area and long term nature of contracts help fuel long term investments in the identified areas and thereby build capacity.

Centralized Registration Process for Common Vendor Base

Various defence procurement agencies such as Director General of Ordnance Factories (DGOF), DPSU, DRDO and Directorate General of Ordnance Services (DGOS), have separate vendor-registration process, while the format for procurement is the same for all. Moreover, vendors registered with any of the departments of the Ministry of Defence can be considered for procurement by other departments. However, there exists no exhaustive vendor database. Devising a mechanism for centralized registration can help in creation of a single vendor database, which can be then used for dissemination of procurement related information. This will help enhance competitiveness through the procurement process, thereby increasing productivity.

IV. PROMOTION OF DEFENCE EXPORTS THROUGH ECA SUPPORT

As has been highlighted in the earlier chapters of the study, defence exports of major exporting economies have generally been supported by the Export Credit Agencies (ECA) of respective countries. These ECAs are typically Government owned although their operations are largely independent.

Like other ECAs, the Export-Import Bank of India (Exim Bank) has also been supporting exports of defence related products and equipment, including vessels and vehicles, and defence related services from India, under its various flagship financing programmes (Box 9). As on September 30, 2015, 120 project exports contracts valued at ₹ 2918.1 Cr were in execution for defence equipments and services (exclusive of dual use items).

Box 9: Exim Bank's Flagship Financing Programmes

Loans to Export Oriented Units: The Bank offers a number of financing programmes for Export Oriented Units (EOUs), importers and for companies making overseas investments. The financing programmes cater to the term loan requirements of Indian exporters for financing their new project, expansion, modernization, purchase of equipment, R&D, overseas investments and also the working capital requirements.

Lines of Credit: The Government of India (GOI), in 2003-04, updated on January 2016, formulated the Indian Development and Economic Assistance Scheme [IDEAS – administered by the Department of Economic Affairs (DEA), Ministry of Finance (MOF)] with the objective of sharing India's development experience through capacity building and skills transfer, trade, and infrastructure development, by extending concessional Lines of Credit (LOCs) routed through Exim Bank, to developing partner countries, towards creating socio-economic benefits in the partner country. These LOCs facilitate import of project-related equipments and services from India by such partner countries on deferred credit terms.

Project Exports: Exim Bank of India plays a pivotal role in promoting and financing Indian companies in execution of projects. Towards this end, the Bank extends funded and non-funded facilities for overseas industrial turnkey projects, civil construction contracts, supplies as well as technical and consultancy service contracts. Indian companies have implemented numerous projects, spanning various sectors, with support from Exim Bank of India. These projects, in turn, facilitate and support infrastructure development in host countries, thereby contributing to the overall development process in the region.

Buyer's Credit under NEIA: The Bank's strong emphasis on increasing project exports from India has been enhanced with the introduction of the Buyer's Credit under GOI's National Export Insurance Account (BC-NEIA) program. BC-NEIA is a unique financing mechanism that provides a safe mode of non-recourse financing option to Indian exporters and serves as an effective market entry tool to traditional as well as new markets in developing countries, which need deferred credit on medium or long term basis. At present, a positive list of 46 countries has been identified for which Indian exporters can avail of Buyer's Credit under NEIA. The list could be suitably expanded / modified on receipt of credit requests for projects from other countries, as has been done in the past.

As discussed earlier, Japan uses its overseas development assistance for supporting exports from the defence sector. A fraction of defence exports are also routed through India's development assistance. Lines of Credit (LOCs) are one of Government of India's major instruments of development assistance. These LOCs are Government of India-backed and Exim Bank-managed credit lines. Under the LOC programme, exports of several defence equipment and services have been facilitated. As on September 30, 2015, exports of nearly ₹ 334.8 Crore was facilitated under the LOC program (Table 34).

As highlighted in Chapter 4, Exim-US, UKEF and EFIC provide export finance to the defence sector in the form of export credit and insurance. Exim Bank also has a wide range of products which have been used to support defence exports.

Exim Bank has played the role of a coordinator and facilitator for the promotion of project exports, besides that of a financier in extending export credits. Exim Bank is equipped to offer a comprehensive financing package to Indian project exporters including funded support, project related guarantee facilities and issuance of letters of credit on their behalf towards third country imports for overseas projects. As on September 30, 2015, Exim Bank has financed various projects for defence equipment and services in different countries, valued at ₹ 2389.2 Crore (Table 35).

Table 34: Exim Bank Financed Defence Equipment and Services under the LOC Program

Company Name	Equipment/Service Exported	Recipient	Region	Value (₹ Cr.)
Goa Shipyard Ltd.	10 Fast Interceptor Boats	Mauritius	Sub Saharan Africa	39.4
Goa Shipyard Ltd.	Water Jet Fast Attack Craft	Mauritius	Sub Saharan Africa	118.1
Hindustan Aeronautics Ltd.	Manufacture and supply of one HAL-DO-228-202 (K) Aircraft	Mauritius	Sub Saharan Africa	104.9
Bharat Electronics Ltd.	Consumable and spare LRUS (Line Replaceable Units) under Annual Maintenance Contract for Indra MK II Radar	Sri Lanka	South Asia	8.3
Bharat Electronics Ltd.	Annual Maintenance Contract for Indra MK II Radar	Sri Lanka	South Asia	1.6
Bharat Electronics Ltd.	Supply of Test Equipment for Indra MK II Radar and USFM Radar	Sri Lanka	South Asia	24.7
Hindustan Aeronautics Ltd.	3 chetak helicopters	Suriname	LAC	37.8
Total				**334.8**

Note: Does not include Dual-use items
Source: Exim Bank Research

Table 35: Projects Financed by Exim Bank for Defence Equipment and Services

Name of Company	Project	Country	Value (₹ cr.)
Engineering Projects (India) Limited	Contract for design, construction, installation, commissioning, and testing of Border Infrastructure Project (Engineer-3 Project) in Oman awarded by The Royal Army of Oman, Sultanate of Oman at a contract value of USD 255 mn (equiv. ₹ 1382 crore)	Oman	1382.0
Goa Shipyard Ltd.	Contract for supply of one Damage Control Simulator (DCS)/ stores on turnkey basis for the Directorate of Procurement, Office of the Commander-In-Chief (Army), Nay Pyi Taw, the Republic of the Union of Myanmar	Myanmar	46.8
Goa Shipyard Ltd.	Contract for the design, construction and delivery of two advanced offshore patrol vessels to the Government of Sri Lanka	Sri Lanka	956.5
Voltas Ltd.	Planned preventive and routine maintenance of the HVAC System at Al Udeid Air base, Doha, State of Qatar	Qatar	3.9
Total			**2389.2**

Note: Does not include Dual-use items
Source: Exim Bank Research

The Bank's strong emphasis on increasing project exports from India has been further enhanced with the introduction of the Buyer's Credit under NEIA Programme. The Indian project exporter, under this programme, is backed by a tailored financing package that meets the funding needs of the project, without impacting the balance sheet of the Indian project exporter. Consequently, while the Indian company remains responsible for timely and satisfactory execution of the project, it is free from commercial and political risks while executing the project.

BC-NEIA is extended by Exim Bank to the governments of recipient countries or to the parastatal project authorities backed by sovereign guarantee. NEIA, through ECGC, provides cover upto 100% for the facility (including interest) and also cover for exchange rate fluctuation till repayment of credit. As on September 30, 2015, one project valued ₹ 194.1 Crore for supply of vehicles and spares to Ministry of Home Affairs, Government of Republic of Tanzania, is being executed with support under the BC-NEIA program.

The support offered by Exim Bank can at the best be considered moderate when compared to the kind of support being provided by other countries to promote their respective defence exports. A primary reason for this is that the ECAs of other countries have a strong financial backing from their respective governments while also not being subject to regulatory norms that are applicable for commercial banks. This is where the GOI could consider bolstering its support to Exim Bank in order to take the exports of Indian defence products to a higher trajectory while at the same time encouraging private sector participation in the entire process. Select mechanisms that the GOI could consider in this respect include the following:

- In addition to existing support under Lines of Credit and Buyer's Credit - NEIA, Exim Bank could be advised to devise a special program

to finance defence project exports wherein interest equalisation support is provided to Exim Bank to offset the difference between the cost of Exim Bank's borrowings and the concessional interest rates offered under the scheme to partner developing countries. Such a mechanism could enable Indian companies to get new orders and increase their defence exports. Defence PSUs may also consider sub-contracting certain jobs to the private sector companies or partner with them (as may be deemed appropriate by GOI). This would enable PSUs to benefit from the skills available in the Indian private sector and also support GOI's 'Make in India' Programme.

- Exim Bank can also, with GOI support, finance strategic defence infrastructure overseas including ports / airbases, bridges and other associated infrastructure under its Lines of Credit programme. However, in order to provide a strategic thrust to such an initiative in the defence space would entail reviewing of existing regulatory norms.

    - For most ECAs across the world, profitability is not a major consideration. For example Exim Korea, as a state-owned bank with a public-policy mandate, maximizing profits has not been a primary focus and hence net interest margin has historically remained low. The ECAs in the USA, Japan, Canada, Turkey and Australia are currently exempt from payment of income tax. It may be noted that the Korean Government compensates Exim Korea for the negative margins between its overall borrowing rates from abroad and the bank's lending rates. The Act establishing Exim Korea provides that if its reserves are insufficient to meet its net loss in any fiscal year, then the government will provide funds to cover the shortfall. Similar is the case with JBIC of Japan. The Japanese government's existing strong support for JBIC in the form of capital injections, low-cost direct funding through the Fiscal Investment and Loan Programme, and guarantees for its foreign-currency funding gives requisite strength to JBIC to support Japanese companies in developing infrastructure overseas, including those related to defence. Exim Bank's charter requires it to be run on business principles with due regard to public interest. Exim Bank has been regularly paying dividends, and its dividend pay-out is one of the highest in the industry. Paradoxically, the higher the dividends pay-out to the GOI, the greater the need for capital. Therefore, Exim Bank could be allowed to plough back its dividend that it is paying to the Government of India and utilise the proceeds exclusively for facilitating development of indigenous defence sector. Exim Bank could also be freed from the requirement of paying tax, with the proviso that the amounts equivalent to the tax load be earmarked for capacity building activities in the private defence sector.

    - Moreover, defence transactions are usually large value transactions and in order to avoid growth limitations in the defence portfolio, Exim Bank must be adequately equipped with equity. It is to be noted that Exim Bank's authorised capital is ₹100 billion, which can be further enhanced by notification. Moreover, as on March 31, 2015, Exim Bank's paid-up capital amounted to ₹ 50.59 billion. Hence, there is enough head room for the paid-up capital to move up.

- The Export Development Fund (EDF) can also be utilized for promoting defence exports. In

1981 when Exim Bank was set up in terms of the Export-Import Bank of India Act, 1981 (Exim Bank Act), a provision was made in the Act for establishing an Export Development Fund. As per the Statement of Objects and Reasons in the Bill placed before the Parliament seeking setting up of the Export-Import Bank of India, "the Export Development Fund is to be utilized mainly for the purposes of research, training, survey, market intelligence etc. in connection with the country's international trade as well as for financing proposals which are unlikely to be supported by banks and financial institutions". The EDF can be used to support such transactions which are considered necessary by GOI as a matter of priority in the interests of the international trade of the country. Credits into this special fund can be made by way of loans, grants, donations or benefactions from GOI or any other sources in or outside India. Given the crucial role of capacity building in the defence sector in making the country self-reliant, financing and facilitating of defence exports can be routed through the EDF.

- A separate Defence Exports Fund (DEF) could also be created by the Government of India with contributions from a group of financial institutions, including Exim Bank. This fund can be a source of cheap finance for the defence sector. Strategic cooperation agreement can be signed by the group of financial institutions with the firms identified under the Strategic Partnership model. Defence projects supported through the DEF can be provided interest subvention by the Government of India. The Government of India can also launch a credit linked capital subsidy scheme through this fund for firms. Such cooperation between defence companies and banks exists in the countries of China and Brazil. There are close ties between China's state owned defence companies and banks. The BNDES in Brazil also had a significant role in the success of Embraer, as it not only provides the company with concessional loans, but is also an important shareholder in the company, through its wholly owned subsidiary.

- Exim Bank can also be appointed as a nodal agency for establishing and approving the eligibility of projects under the Defence Technology Product Development Fund recommended earlier in the study for design and development in the SME sector.

- The Cabinet Committee on Economic Affairs, at its meeting held on September 16, 2015, approved the proposal of the Department of Economic Affairs, Ministry of Finance, Government of India for a new concessional financing scheme to enable Exim Bank to offer concessional finance to support Indian companies bidding for strategically important infrastructure projects overseas. Under this concessional financing scheme, Exim Bank will provide letter of support by way of Buyer's Credit for part financing a power project. The letter of support will enable Indian companies to participate in the tendering process for EPC contract of the projects under an International Competitive Bidding. Going forward, support can be granted to other strategically important projects such as development of airports, air-base, etc.

- The Cabinet Committee on Economic Affairs has approved the Interest Equalisation Scheme (earlier called Interest Subvention Scheme) on Pre and Post Shipment Rupee Export Credit with effect from 1st April, 2015 for five years. The scheme will be evaluated after three years. The rate of interest equalisation is 3 percent and is available to

all exports from MSME units and 416 tariff lines. While such initiatives are expected to reap benefits for merchandise exports, it is also essential to focus on other facets of exports, especially those which are capable of withstanding the pressure on the country's current account balance in the face of global slowdown. With industrial demand slowing down globally, governments around the world are now targeting project exports as vital conduits to exporting high-value machinery, labor, expertise, and technology. Hence, the Government may consider extending the scheme to project exports including defence projects.

Currently, the BC-NEIA programme is envisaged as a commercial or quasi-commercial priced product, and there is high resistance to such pricing occasioned by Chinese competition and the concessional pricing under the LOC programme. Interest equalization support can enhance the attractiveness of the programme and enable the Indian exporters to canvas aggressively for overseas projects.

- RBI can consider extending a line from its foreign exchange reserves to Exim Bank at an interest rate equal to the average return earned by RBI on deployment of the reserves for long-term financing of export-oriented defence manufacturing, strategic acquisitions overseas, technology transfer, etc. The actual release may be in annual tranches. This will enable Exim Bank to provide long term Buyer's Credit and LOC to the defence sector, which are in alignment with the estimated cash flow streams from the assisted projects. This mechanism would not only reduce borrowing costs for Exim Bank but also allow it to extend larger quantum of finance to support large defence contracts. The use of foreign exchange reserves to finance overseas projects of national interest is being done by Exim China. In 2015, Exim China received US$ 30 bn from China's Central Bank to support the country's 'belt and road' economic plan.

CONCLUSION

The policy initiatives in recent times have brought about a paradigm shift in the defence sector with a renewed focus on self-reliance, import substitution, technology upgradation and indigenization. Regulatory changes have created a facilitating environment for greater foreign investment and increased domestic private participation. The reforms in defence sector coupled with the high domestic demand emanating from extensive modernization plans of the Indian defence services, is set to position India as an important defence sourcing hub.

There remains further scope for improving the eco-system for domestic defence suppliers. Setting lower threshold limits and higher offset percentage requirements; according special priority status to the defence sector; and setting up export control systems in consonance with the major international non-proliferation regimes are some of the important policy measures which can help strengthen the domestic production capabilities and bolster exports.

Being a technology and capital intensive industry, focus on R&D will be crucial, especially in the areas of applied research and development. Setting up a Defence Technology University; cost-plus contract structure; public-private partnerships in providing test facilities; and subsidies on test fees for MSMEs can further facilitate indigenization. Design and development projects can also be promoted through funds of non-lapsable nature.

Competitiveness of defence players can be improved through centralization of registration process of defence procurement agencies. Select firms from the private sector can also be encouraged through government incentives like sharing of R&D expenses and low cost finance. Apart from these, promotional activities through a dedicated council under the Ministry of Defence can help display Indian capabilities.

Finance will be crucial for encouraging private participation in the defence space and Exim Bank can provide an enduring support to the sector through its various programmes. The Government of India can further provide vigor to Exim Bank's activities in the defence sector through provisioning of interest equalization support in defence project exports supported by the Bank. Exim Bank can also play a pivotal role in facilitating exports of firms identified under the Strategic Partnership Model. It can also establish and approve the eligibility of projects under the technology development funds.

Through these initiatives the Indian private sector can be equipped to leverage the domestic demand and also develop export capabilities in the defence sector, thereby pushing the growth curve of the sector on a higher trajectory.

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