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# THE INDIGENISATION OF INDIA'S DEFENCE INDUSTRY

DHRUVA JAISHANKAR



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## EXECUTIVE SUMMARY

An indigenous defence industry is a vital objective for India given its security environment and strategic objectives. India has a large and growing defence budget and a long history of defence industrial production. However, the country remains heavily reliant on defence imports, particularly for major platforms, while its own exports are extremely meagre. Although several high-level committees have been established to address the problem of defence industrial indigenisation, very few of the necessary steps have been taken. In part, this is because India faces a number of dilemmas in trying to reform its defence industry: the normal rules of market economics do not apply; ideal objectives of quality, cost, and timeframes cannot be achieved simultaneously; defence budgets remain susceptible to cuts; the nature of defence supply chains is changing; and little heed has been paid to policies to maximise technological absorption. Moreover, major stakeholders confront their own challenges: India's powerful defence public sector faces conflicts of interest and is resistant to change; the armed services provide unrealistic qualitative requirements; the Ministry of Defence lacks specialisation; the Finance Ministry discourages long-term spending; and the political leadership lacks expertise and is reluctant to make decisions due to political perceptions. To address these diverse challenges, efforts should be made to ensure predictable long-term requirements and create a more level playing field between the public and private sectors. Further, a mechanism must be found to ensure predictable capital expenditure, in order to incentivise investment. Without such steps being taken, India will continue to struggle in its quest for defence indigenisation.

## INTRODUCTION

A government bears ultimate responsibility for a country's security. Its ability to equip its armed forces using its own industrial and technological capabilities is of great importance, particularly if a conflict were to see disruptions to supply lines, potential sanctions from arms suppliers, and urgent orders for armaments. A successful defence industry also provides strategic leverage with other countries, including as a potential supplier to neighbours who may otherwise turn to competitors.<sup>1</sup> Furthermore, defence exports reduce the costs of defence acquisitions and can help subsidise a country's defence budget; in Israel's case, exports finance the country's defence research and development (R&D) to a considerable degree. For all these reasons, the indigenisation of a defence industry is a necessary and worthwhile national security objective, particularly for a large country like India with an expanding economy, a wide variety of security challenges, and growing international obligations.

India's defence industrial situation today is unique. It has the world's fifth-largest defence budget at over ₹4 lakh crore or approximately \$60 billion, about 25% of which is allocated to capital expenditure.<sup>2</sup> India also has a very large defence industrial establishment with a long history of defence production. This includes 52 labs belonging to the Defence Research and Development Organisation (DRDO), nine Defence Public Sector Units (DPSUs),<sup>3</sup> and 41 ordnance factories under the Ordnance Factory Board involved in lower-technology defence production.<sup>4</sup> Furthermore, India has been on a quest for defence industrial self-reliance almost since independence. The licensed production of Western and Soviet defence platforms began in the 1950s: by 1957, India was producing jet engines, and by the 1960s, it had embarked upon the manufacturing of an indigenously-designed combat aircraft, a jet trainer, a self-loading rifle, and field artillery radars, all with technological assistance from over 10 countries belonging to the Western and Eastern blocs.<sup>5</sup>

Despite these apparent early mover advantages and clear objectives, India's ability to equip its own military remains woeful. India is the second-largest importer of defence equipment in the world over the past five years (2014-2018), behind only Saudi Arabia; it imports about twice as much as China.<sup>6</sup> It is dependent on foreign suppliers for most major weapon platforms, particularly at the higher technological levels: combat, transport, and reconnaissance aircraft; frigates and attack submarines; howitzers and anti-aircraft systems; etc. While a goal of 70% self-reliance was set in 1992, estimates are that India was only 38.5% self-reliant in 2011.<sup>7</sup> Additionally, as an indicator of the quality of its defence production vis-à-vis competitors, Indian exports are negligible: about three percent of China's. The only significant export successes in recent years have involved offshore patrol vessels (OPVs) to Mauritius, Sri Lanka, and other expected recipients.<sup>8</sup>

What is preventing India from achieving its objective of defence industrial self-reliance? This challenge has been deliberated at great length for many years, and is the subject of a great many expert committee reports commissioned by the government, including – but not limited to – the APJ Abdul Kalam Committee in the 1990s, a Group of Minister's (GoM) Task Force on the Management of Defence headed by Arun Singh in 2001, the Kelkar Committee Report on self-reliance and revitalising DPSUs in 2005, the Sisodia Committee Report on improving defence acquisitions in 2007, and the Naresh Chandra Committee Report on national security in 2012.<sup>9</sup> The Abdul Kalam Committee recommended redressing India's import-export ratio. The GoM report advocated better coordination through a Defence Ministers' Council on Production, the increased participation of the private sector, a defence export policy, and a focus by DRDO on "core technologies, in which expertise is neither available within the country nor can be procured from alternative sources."<sup>10</sup> The Kelkar

Committee Report made several recommendations including long-term planning for acquisitions, a dedicated acquisitions agency structured along the lines of France's Direction Générale de l'Armement (DGA), an offset policy to mandate re-investment into India by foreign suppliers, an export marketing organisation, the incorporation of ordnance factories under a single entity, and foreign investments by DPSUs to acquire technology. Since then, the role of the private sector in Indian defence production has grown and the offset clause has been introduced. The Sisodia Committee recommended involving industry in the acquisition process, including in setting qualitative requirements.

## KEY ACRONYMS & TERMINOLOGY

### PROCUREMENT PROCESS

- DPP: Defence Procurement Procedure
  - RFI: Request for Information
    - SQR or QR: Services Qualitative Requirements
    - EPP: Enhanced Performance Parameters
    - AoN: Acceptance of Necessity
  - RFP: Request for Proposal
    - TEC: Technical Evaluation Committee
    - FET: Field Evaluation Trials
    - TOC: Technical Oversight Committee
  - CNC: Contract Negotiation Committee
    - CFA: Competent Financial Authority
    - ToT: Transfer of Technology
    - L1: Lowest-cost vendor in a competitive tender

### INDIA'S DEFENCE INDUSTRY

#### *Public Sector*

- DRDO: Defence Research and Development Organisation
- DPSU: Defence Public Sector Unit
- OFB: Ordnance Factories Board

#### *Private Sector*

- OEM: Original Equipment Manufacturer

### RECENT DEVELOPMENTS

- DPC: Defence Planning Committee (created in 2018)
- SP: Strategic Partnership [Model]
- TPCR: Technology Perspective and Capability Roadmap (produced by HQ Integrated Defence Staff)

While these are all strong recommendations, the primary element limiting India's bid for an indigenous defence industry today is policy unpredictability. This has two interrelated elements. The first concerns unpredictable requirements, particularly long-term requirements for future security scenarios. Addressing this will necessitate identifying a clear roadmap for India's defence industry that squares quantitative requirements for equipment with budgetary considerations, technological availability, industrial capacity, and export potential. The second concerns unpredictable expenditure. This will require ensuring an adequate capital budget and multi-year financial commitments to encourage investment, innovation, and competitive bids. This Impact paper highlights some of the dilemmas still facing India's quest for defence industrial indigenisation, provides an analysis of key stakeholders' perspectives, and makes broad recommendations to ensure policy stability so as to boost India's indigenous defence industrial sector.

# I. DILEMMAS FACING INDIA'S DEFENCE ACQUISITIONS

Defence acquisitions consists of three elements: (1) research and development (R&D), (2) defence production, and (3) procurement, whether from foreign or domestic sources. In India, this process requires a combination of technical, financial, management, and operational expertise from a variety of stakeholders, including: (a) the three military services (Army, Air Force, Navy), as the ultimate users of defence equipment; (b) the Ministry of Defence; (c) the Ministry of Finance; (d) the public-sector defence industry and scientific establishment; (e) the private sector defence industry and research establishment; and (f) the political leadership as the ultimate arbiter and decision-maker on matters of acquisition. Together, the defence industrial establishment confronts a number of major dilemmas:

**The economics of the defence industry do not follow the normal rules of economics, for several reasons.** First, it is difficult and in some cases impossible to manufacture armaments in large enough numbers to benefit from economies of scale (barring certain equipment for the infantry). Major platforms are acquired in the dozens, sometimes hundreds, and almost never the thousands, although the Indian armed services' large size and requirements mean that India is better-placed than most countries to procure at scale. Nonetheless, costs per unit in the defence industry are very high, particularly when research and development are taken into consideration. Second, the defence sector is a monopsony – there is only one buyer: the Indian armed services. This leads to further market distortions. Third, because of the first two considerations, there are frequently monopolies in the defence sector: often, sole suppliers of a particular product. New entrants are inhibited by very high capital costs, carefully-guarded intellectual property, and the uncertainty of the procurement process. This further alters the calculations of both buyer and seller. Many countries – including the former Soviet Union – sought to address the problem of monopolies by having two or more rival design teams and production lines.<sup>11</sup> Fourth, defence technologies, even when owned by private corporate entities, are subject to immense regulation by national governments on national security grounds. Governments, rather than corporate entities, often identify and control export markets. Among other implications, these factors mean that – unlike most sectors where it can rely on its large domestic market – India may have to carefully consider potential overseas markets for its future defence industry, particularly if it wants to manage unit costs. Finally, there is a significant difference between the economics of lower-technology weaponry and high-technology systems. In the absence of sufficient design and technical skills, the costs of independently developing the latter are higher by orders of magnitude, due to high requirements for precision, miniaturisation, and materials; expensive testing and development facilities; and export controls.<sup>12</sup>



**India aspires to (i) the acquisition of high-quality equipment, at (ii) low cost, in (iii) a short time-frame, when only two of these three are possible at any time.** There are three possibilities to address this trilemma in the acquisitions process. One is to acquire high-quality equipment at a low cost but with the foreknowledge that acquisition could take many years, and possibly decades, particularly for sophisticated systems. This may make the induction of these platforms too late to meet urgent defence requirements, and given the high pace of technological change, may mean that the equipment is obsolete by the time it becomes available. The second option is to acquire high-quality equipment at short notice by paying at or above international market rates. This option is constrained by budgetary considerations and political perceptions. The third possibility is to acquire low-quality equipment at short notice and relatively low cost, although this may compromise preparedness vis-à-vis competitors, particularly those that enjoy far greater capabilities, such as China. Thus, critical decisions will need to be made to sacrifice either cost, quality, or speed of acquisition. If clear decisions along these lines are not made, India could find itself in the worst of all worlds: spending high amounts belatedly for substandard quality equipment. In fact, India has often had to make costly panic purchases following conflicts, often too late to make a difference, whether after the 1962 Sino-Indian border conflict or crises with Pakistan.

**India's defence budget is at a historic low but it remains susceptible to cuts and considerable uncertainty.** The relative decline of defence budgets is a common problem in democratic societies, and not unique to India. Unlike social services or many other elements of government spending, defence is the sole preserve of the national government. Its functions cannot be replicated or replaced by the private sector. But in peacetime, defence budgets remain the easiest element to cut from the overall budget, including to reduce the fiscal deficit or to create greater room for social welfare spending. Other than briefly in 2007, India's defence spending as a percentage of the economy after 2015 has been the lowest since the 1962 Sino-Indian border war.<sup>13</sup> Within the total defence budget, a higher proportion is being allocated to revenue expenditure and pensions, rather than capital expenditure for equipment, and this trend may continue with the expansion of the army, proposed pension reforms, and future pay commissions. An additional problem unique to India is the annual lapsing of financing for the services' capital expenditure. Every year, a sizeable percentage of the capital budget that has gone unspent is returned to the Finance Ministry, creating further disincentives for long-term investment and innovation.

**21<sup>st</sup> century defence production is more dispersed across countries and regions than 20<sup>th</sup> century defence production.** Government policies are often designed for 20<sup>th</sup> century defence production processes. This implies assembly at a single site and the centralisation of raw materials, technology, and component manufacturing. The reality is that defence production is becoming increasingly dispersed across regions and even countries, particularly in an era of network-centric warfare. The dispersal of defence production also erodes its political value, whether the creation of concentrated employment or the publicity surrounding final assembly. Hypothetically, if 70% of the value of a platform is manufactured in India, but the final assembly takes place overseas, it could still be considered a 'Make in India' success. Indeed, some private defence manufacturing has come to India organically, with India producing metallurgical products and components for major defence platforms that it does not even acquire. By the same token, Indian companies, including in communications and avionics, are already providing equipment to foreign militaries but are not cleared to equip the Indian armed services. These new realities will require rethinking defence joint ventures in a more expansive manner and carefully evaluating the benefits associated with various manufacturing models.

Indigenisation is ultimately about self-reliance: the ability of a country to meet its own security needs. But in India it is often equated with self-sufficiency – the belief that India can meet all its requirements without external assistance or partnerships. This is short-sighted. No country has successfully indigenised its defence industrial base without external support: between the 1940s and 1960s, the Soviet Union benefited tremendously from German technology; China benefited from the Soviet Union; Israel benefited from France, and so on.<sup>14</sup> Even successful indigenous programmes in India have benefited considerably from external technology, knowledge, materials, and components, from the original HF-24 Marut fighter aircraft, which had German designers, to the Light Combat Aircraft (Tejas), which has U.S.-produced jet engines. At the very least, foreign inputs accelerate technological development considerably, and several proposed indigenous projects are seeking precisely that.

**Policies designed to maximise technological access may have to make way for policies designed to maximise technological absorption.** For decades, and especially since India's 1998 nuclear tests, India has been on a quest to rid itself of the shackles of defence technological denials. Today, those objectives have largely been achieved, and India is perhaps uniquely positioned to access some of the most advanced technologies from Russia, the United States, France, and Israel, among other providers. The United States recently elevated India to an export control status on par with many treaty allies (Strategic Trade Authorization-1), even as India looks set to acquire the S-400 anti-aircraft missile system from Russia. But the Indian defence establishment now has to shift gears, to think beyond technological access. To ensure the absorption of technology, India will have to provide attractive incentives for private investment in India's defence sector, ensure a level of

consistency and transparency in the acquisitions process, and take measures to ensure the security of that technology. Additionally, India will have to reconsider piecemeal acquisitions of a variety of platforms that may not be able to work together in a networked warfare environment. Thus, a policy of diversification – which has paid rich political dividends to date – may become harder to sustain. A 5<sup>th</sup> generation fighter aircraft is a computer, as is a top-of-the-line anti-aircraft system, and those two computers may not be compatible. Finally, there will always be trade-offs between modernisation impulses (which will be short-term and may necessitate imports) and indigenisation objectives (which will be long-term, particularly when transfers of technology are required).

## II. ASSESSING THE STAKEHOLDERS

Just as the challenges facing India's defence procurement are complex and contradictory, there are no easy solutions for addressing these dilemmas. Indeed, no single organisation or entity bears sole responsibility for the sub-par state of India's defence industry. Each major stakeholder will have to make necessary adjustments.

**Defence Public Sector:** India has operated to date with an unusually powerful defence public sector. This came about for a few reasons: the 1951 Industries Act created state monopolies by requiring compulsory licensing. Foreign exchange shortages and political circumstances led to a focus on license production rather than technological absorption. Other steps towards centralisation made sense in these early years, but are less applicable today: in 1948, the Ordnance Factories were placed under the Ministry of Defence, DRDO was created in 1958, and a Department of Defence Production was created in 1962. The Defence Procurement Procedure, beginning in 1992, gave right of first refusal to DRDO, and the head of DRDO often doubled as Scientific Advisor to the Defence Ministry, creating an inherent conflict of interest. DRDO leaders have admitted that in a bid to secure projects, unrealistic timeframes and impossibly low budgets were provided. Only after 2001 did private sector participation in the defence sector begin to be encouraged. FDI in defence was raised to 26% in 2001 and 49% in 2014, a step in the right direction but still not enough to incentivise foreign investment.

Even today, the DPP prioritises public sector entities in various ways, ensuring an uneven playing field. This is despite the performance of DPSUs and ordnance factories being mixed. Some that have been functioning well can be further promoted, while a second category could benefit from joint ventures with the private sector, both domestic and foreign. In fact, a large number of Memoranda of Understanding (MoUs) have been signed between DPSUs and foreign entities.<sup>15</sup> A third category will require more comprehensive transformation, although this will be opposed by unions. In addition to making existing public sector units more competitive, encouraging alternative private sector supply chains and encouraging collaborations similar to the Indian Space Research Organisation (ISRO) – which retains authority, autonomy, and technical control, but sources critical components from the private sector – could be considered.

**Armed Services:** With some notable exceptions, particularly in the Navy, the military lacks sufficient expertise in budgeting, design, and articulating technical requirements.<sup>16</sup> The creation of an Acquisition Wing, with Technical Managers from the services, has helped bridge the gaps somewhat. The Integrated Defence Staff (IDS) began to provide military inputs and expertise but has also

highlighted redundancies, lack of accountability and monitoring, and delays. India is also unusual in that staff and operational functions are not separated within the senior military leadership; in most other major militaries, uniformed staff officers can mediate between the operational requirements of military commanders and the civilian leadership. Furthermore, there are currently few avenues for Indian R&D – particularly that being conducted by small and medium enterprises – to interface at an early stage with services, and vice-versa. Unlike in many other countries, the relationship between the services (as consumers) and the industrial, research, and technological community (as providers) is currently one of buyers and sellers, rather than collaborative partners.

At the same time, challenges remain in ensuring feasible inputs and assessments from the armed services. Qualitative Requirements (QR) provided by the services have often provided unrealistic technical specifications, often as part of a negotiating strategy and factoring in long delays in acquisitions. The trilemma of cost, quality, and time is not sufficiently addressed, and this means factoring in costs at an early stage of the defence procurement process. The fact that procurement takes time – and that QRs are sometimes applied retroactively – leads to further delays. Therefore, the armed services need to be further integrated in the entire acquisitions process and factor in costs and timeframes when articulating their qualitative requirements.

**Ministry of Defence:** India is unusual in not having a specialised defence bureaucracy, other than in certain areas, such as auditing and accounting by the Indian Defence Accounts Service (IDAS). In addition to an acquisitions wing, there is also a very small defence policy unit led by a joint secretary, which oversees all international cooperation. By contrast, defence acquisitions are overseen in the United States by the Office of Secretary of Defence, in France by the Direction Générale de l'Armement (DGA), and in China by the State Administration for Science, Technology and Industry for National Defence (SASTIND).

Beyond the administrative challenges, the Defence Ministry also faces policy impediments. While an offset policy was introduced to ensure re-investments into India by foreign manufacturers, it has failed to incentivise technology transfers. Foreign companies – often decrying the absence of Indian industry's ability to absorb technology – approach offsets as a basic obligation to reluctantly fulfil, resulting often in licensed production in India with marginal value added. Similar challenges, as well as those of uncertainty and vagueness, have bedevilled the Strategic Partnership (SP) Model, which was meant to promote 'Make in India' in defence by attracting foreign investment. Additionally, there are few avenues for the Defence Ministry to coordinate with other relevant industrial ministries – the Ministry of Commerce and Industry, the Ministry of Micro, Small, and Medium Enterprises, and the Ministry of Heavy Industry and Public Enterprises – as well as the higher education sector. All-in-all, it

is crucial that the Indian government integrate the services further within the civilian bureaucracy and incentivise longer-term tenures for bureaucrats in the Ministry of Defence to deepen specialisation.

**Finance Ministry and Budgeting:** The defence budget fell as a proportion of the overall union budget from 30% in 1950-1951 to 15% by the 1962 Sino-Indian border war and remains a low proportion today: 11.6% in 2018 not counting pensions, only slightly higher than state subsidies (10.8%).<sup>17</sup> Of the total defence budget, approximately three-quarters goes to revenue expenditure and pensions, which will only increase barring reductions to personnel. (China's People's Liberation Army, by contrast, is significantly reducing the size of its armed forces as part of its ongoing modernisation efforts.) Additionally, research and development spending is subpar: unlike in other domains where the private sector may be willing to invest in R&D, in defence the government will have to carry a greater burden (approximately 25-50% based on the experiences of other countries) to offset the risk of failure. Unlike other middle powers, India does not use defence exports to offset its defence budget. In countries such as Russia, France, the United Kingdom, and Israel, defence exports help to offset approximately 20-40% of their overall defence budgets.

Beyond addressing the total defence budget, and its allocation between revenue, pensions, and capital expenditure, uncertainty on the part of the Finance Ministry remains a significant challenge. Each year, unspent capital expenditure is surrendered back to the Finance Ministry, and the possibility of a non-lapsable or roll-on defence modernisation fund has been resisted, despite public support from Defence Ministers. Questions about how these funds will be raised, and how they will be utilised, complicate that discussion. Nonetheless, ensuring a mechanism for predictable budgeting and spending for the Defence Ministry's capital expenditure is of paramount importance. Assured spending is absolutely necessary for long-term investment and R&D.

**Political Leadership and Process:** The political leadership has traditionally suffered from two shortcomings. The first is a lack of sufficient expertise in the various aspects of defence acquisition to play the role of arbiter. The second is a reluctance to make decisions due to the perception of corruption, which in turn has led to inordinate delays. Beginning in 1979, controversies surrounding corruption – both real and perceived – have dogged India's defence acquisition process. Uncertainty about timeframes has also created disincentives for investment in the defence sector, both by domestic and foreign entities. Top-down changes will have to be led by the political leadership, especially in: (a) ensuring consistency in funding and acquisitions, (b) ensuring defined requirements over a long-term period, and (c) synchronising budgets with requirements. This process could take the form of a defence industrial planning document. Currently, planning documents do exist, but are not sufficiently strategic, integrated, or institutionalised. These include a Long Term Integrated Perspective Plan

(LTIPP), Five Year Plans (FYP), and Annual Acquisition Plans (AAP). These documents are either of too short a duration to address the long-term process of indigenisation, or become “a collation of wish lists” from the services.<sup>18</sup> Overall, greater knowledge on the part of political leaders and greater transparency in the procurement process would contribute to more timely decision-making on vital matters of national security.

An irony is that due to the widespread perception of political interference, the defence procurement process in India is unusually rigid, with the same process being used for the procurement of a wide variety of systems with different degrees of sophistication. The process is also multi-layered, with diffused accountability, making reforms difficult. The standard process as detailed in the Defence Procurement Procedure (DPP) of 2016 begins with a Request for Information (RFI) indicating capabilities and quantities sought, the timeframe, the finalisation of services' qualitative requirements, and the issuance of an Acceptance of Necessity (AoN). After soliciting offers, a detailed request for proposals (RFP) is issued, beginning the second stage. Competing bids face a technical evaluation committee (TEC) and undergo field trials and staff evaluations under a technical oversight committee (TOC). After that, the third stage begins when a contract is negotiated by a contract negotiation committee (CNC), and approved by a competent financial authority (CFA), before being awarded. The acquisition process has traditionally been overseen by a Defence Acquisition Council chaired by the Defence Minister, and major expenditure requires clearance from the Cabinet Committee on Security.<sup>19</sup>

The entire process is meant to minimise subjectivity, which often means falling back on the lowest cost system that meets specified requirements (or the 'L1'). While attempts have been made to dilute L1 through an Enhanced Performance Parameter (EPP) process – which gives a credit score for bids that successfully demonstrate additional capabilities during evaluations – this has not been fully implemented. Thus, technological factors are not given sufficient consideration at the price negotiating stage, just as costs are not adequately considered earlier in the process when articulating qualitative requirements. Ironically, despite such rigidity, the process is still not entirely objective: indeed, subjectivity can be injected at various stages, such as (i) minor changes to the qualitative requirements that can disqualify certain potential bids, (ii) during field trials and evaluations, and (iii) during contract negotiations, including the setting of benchmark prices.<sup>20</sup>

### III. RECOMMENDATIONS

There are no easy solutions to the multiple simultaneous dilemmas facing India's defence acquisitions process, particularly given the diverse objectives of numerous stakeholders. Instead, it will require several steps, which will inevitably be to the detriment of certain interested parties. But if these hard choices are not made, India will continue to fail in its quest for defence industrial self-reliance. It will continue to founder in indigenous projects, it will not acquire the equipment necessary to meet its security needs, and it will be forced to make expensive panic purchases. Identifying both the dilemmas facing India's defence acquisitions process and the impediments being placed by various stakeholders represents just the first step towards setting India on a path to true indigenisation.

Ultimately, policy stability and predictability – particularly when it comes to identifying requirements and financial outlays – are of the greatest importance. The key recommendations are therefore as follows:

- **Predictable Requirements:** The armed services must take primary responsibility for articulating their short-, medium-, and long-term quantitative requirements for equipment, taking into consideration technological quality, costs (including life-cycle and system costs), India's industrial capabilities, and export potential. This coherent and realistic process – whether or not it results in a single defence industrial planning document that supersedes existing plans – might be led by the IDS, but will require the support and approval of the Ministry of Defence, Defence Planning Committee, and the Cabinet Committee on Security. Among other things, this process – which will take at least one year and should be revisited periodically given the pace of technological change (every 4-5 years) – should:
  - Identify priority areas for transfer of technology, and ways to assess transfers of technology from foreign OEMs to public and private Indian entities.
  - Assign budgetary estimates for the procurement of specific systems over the short-, medium-, and long-term.
  - Create a methodology for price indexing technology to ensure objective assessments of the costs of technology.
  - Create realistic timeframes for indigenisation after consultations with Indian R&D centres and industry (both public and private).
  - Identify potential export markets for specific weapon categories.



Additionally, in a bid to make India's defence public sector more competitive, the Defence Ministry must:

- Ensure via changes to the DPP, that the acquisitions process is neutral on public vs private sector options, and sensitive only to Indian vs foreign manufacturing. A level playing field between the Indian public and private sectors will accelerate the process of indigenisation by increasing competition.
- **Predictable Expenditure:** Given that prioritising time and quality will mean compromising on cost, India will have little choice but to procure defence technology at or above international market prices if it is to ensure technology transfers, which, in turn, are required for the long-term objective of achieving defence industrial self-reliance. Additionally, consistency in budget allocations and minor tweaks to the regulatory environment will create greater incentives for private sector investment in the Indian defence industry. This, in turn, will help increase competition, reduce costs, and spur innovation.
  - The political leadership should work with the Finance Ministry to ensure a sufficient overall defence budget with an appropriate allocation to capital expenditure, including R&D, in line with requirements.
  - The Defence and Finance Ministries, with arbitration from the political leadership, must find a durable yet flexible mechanism for multi-year expenditure for defence procurement, whether non-lapsable funds or multi-year budgets.
  - Current policies – from investment caps to offsets – may need to be revisited to create better incentives for long-term private sector investment in defence, including in R&D.

## ENDNOTES

- <sup>1</sup> For arms exports as a factor in regional influence see "Asia Power Index," Lowy Institute, 2018, [https://power.lowyinstitute.org/downloads/LowyInstitute\\_AsiaPowerIndex\\_2018-Summary\\_Report.pdf](https://power.lowyinstitute.org/downloads/LowyInstitute_AsiaPowerIndex_2018-Summary_Report.pdf). While India has provided considerable military support to Bhutan and Mauritius, and to a lesser degree Sri Lanka, Nepal, the Maldives, and the Seychelles, several neighbours have been among the largest recipients of Chinese arms, notably Pakistan but also Bangladesh and Myanmar.
- <sup>2</sup> Ministry of Finance, *Union Budget 2019-2020 Vol. II*, (New Delhi: Government of India, 2019).
- <sup>3</sup> Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), Bharat Earth Movers Limited (BEML), Mishra Dhatu Nigam Limited (MIDHANI), Mazagaon Docks Limited (MDL), Garden Reach Shipbuilders and Engineers (GRSE), Goa Shipyards Limited (GSL), Hindustan Shipyards Limited (HSL).
- <sup>4</sup> Dinesh Kumar, "Defence PSUs, Ordnance Factories Are In Dire Need of Overhaul," *The Sunday Guardian*, 8 December 2018; "Defence Public Sector Undertakings," Department of Defence Production, Ministry of Defence, 26 April 2019, <https://ddpmod.gov.in/defence-public-sector-undertakings>
- <sup>5</sup> Anil Chopra, "India's Fighter Engine Dream," *South Asia Defence & Strategic Review*, Vol. 11, No. 2, 2017, 48; Sushant Singh, "In fact: 49 years before Tejas, India had its own fighter – Marut," *The Indian Express*, 8 July 2016.
- <sup>6</sup> SIPRI Arms Transfers Database, Stockholm International Peace Research Institute (SIPRI), 11 March 2019, <https://sipri.org/databases/armstransfers>; SIPRI uses a calculated unit called Trend Indicator Value (TIV) to measure the volume of arms transfers across countries, currencies, and time periods.
- <sup>7</sup> Laxman Kumar Behera, *Indian Defence Industry: Issues of Self-Reliance*, IDSA Monograph Series, No. 21, July 2013, 51.
- <sup>8</sup> SIPRI Arms Transfers Database.
- <sup>9</sup> Many reports have not been fully declassified. See: Group of Ministers, "Reforming the National Security System," February 2001; Ministry of Defence, "Kelkar Committee Submits Report on Defence Acquisition," Press Information Bureau, 5 April 2005, <http://pib.nic.in/newsite/ereelcontent.aspx?reid=8386>
- <sup>10</sup> Group of Ministers, "Reforming the National Security System," 111.
- <sup>11</sup> For example, Sukhoi and Mikoyan (MiG) for fighter aircraft, Antonov and Ilyushin for transport aircraft, Mil and Kamov for helicopters, and so on.
- <sup>12</sup> Andrea Gilli and Mauro Gilli, "Why China Has Not Caught Up Yet: Military-Technological Superiority and the Limits of Imitation, Reverse Engineering and Cyber Espionage," *International Security*, Vol. 43, No. 3, 2018-2019, 141-189.
- <sup>13</sup> "Yearbook: Armaments, Disarmament and International Security," Stockholm International Peace Research Institute, 2018.

- <sup>14</sup> Thousands of German scientists and their families were relocated to the Soviet Union in the immediate aftermath of World War II, where they contributed to the development of the nuclear programme and to the transfer of rocket technology for what became the basis of the USSR's missile programme. See: Asif A. Siddiqi, "Germans in Russia: Cold War, Technology Transfer, and National Identity," *Osiris*, Vol. 24, No. 1., 2009, 12-143; Between 1949 and 1963, the Soviet Union provided China with 1,400 blueprints and 21,000 scientific and technical documents, helped establish 198 Chinese enterprises and assisted 88 other enterprises and projects, educated 14,000 Chinese students and 38,000 apprentices, and provided 10,800 experts. See: K. Subrahmanyam, "Defence Preparations in India and China," *Bulletin of the Atomic Scientists*, May 1968, 29; In the 1950s, France provided Israel with Mirage fighters, tanks, and armoured vehicles, as well as support for its nuclear programme. See: Avner Cohen, *Israel and the Bomb* (New York: Columbia University Press, 1998), 19 and 361.
- <sup>15</sup> "PSUs in Defence," Press Information Bureau, Government of India, 25 July, 2018; Select examples of public sector defence MoU partners include entities from Russia (Rosoboronexport, Viam, JSC United Shipbuilding), UK (Thales, Chemring, NAIAD, Griffon), France (Thales, DCNS), Sweden (BAE), Israel (Elbit, Reschef), Germany (FHS, MTU Friedrichshafen), Spain (Indra Sistemas), Italy (DRASS), Bhutan (CDCL), Bangladesh (Khulna Shipyard Limited), Ukraine (Ukroboronprom), and the United States (Coresol).
- <sup>16</sup> Srinath Raghavan, "Military Technological Innovation in India: A Tale of Three Projects," *India Review*, Vol. 17, Issue 1, 2018, 122-141.
- <sup>17</sup> Ministry of Finance, *Union Budget 2019-2020*.
- <sup>18</sup> "Make in India: Through Indigenous Research and Development by DRDO/Industry," VIF Task Force Report, Vivekananda International Foundation, 2019, 48.
- <sup>19</sup> "Handbook on Writing Cabinet Notes," Cabinet Secretariat, Government of India, 2011.
- <sup>20</sup> Amit Cowshish, "A Recurring Scandal," *The Indian Express*, 6 May 2016.



## ABOUT THE AUTHOR

**Dhruva Jaishankar** is Fellow in foreign policy studies at Brookings India in New Delhi and the Brookings Institution in Washington, DC. He is also a Non-Resident Fellow with the Lowy Institute in Australia. His research examines India's role in the international system and the effects of global developments on India's politics, economics, and society, with a particular focus on India's relations with the United States, the Indo-Pacific, and Europe.

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