

LEVERAGING DEFENCE OFFSETS TO STRENGTHEN DEFENCE INDUSTRIAL BASE: PROBLEMS AND PROSPECTS

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by

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CERTIFICATE

This is to certify that the thesis titled “**Leveraging Defence Offsets to Strengthen Defence Industrial Base : Problems and Prospects**”, being submitted by **Mr. Rambir Singh Mann to the Indian Institute of Technology, Delhi**, for the award of the degree of **Doctor of Philosophy**, is a record of original bona-fide research carried out by him under my supervision. In my opinion, the thesis has reached the standards fulfilling the requirements for submission relating to the degree.

The results contained in the thesis have not been submitted, in part or full, to any other institute or university for award of any degree or diploma.

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ABSTRACT

Defence offsets are a form of countertrade that is sought by over 140 nations globally. It is demanded by nations importing arms from foreign manufacturers as a percentage of the value of the main contract. There are adequate examples where defence offsets have assisted nations in building an indigenous Defence Industrial Base (DIB). On the other hand, an equal number of nations have failed to leverage defence offsets effectively. India adopted defence offsets as a policy tool in 2005, with the aim of strengthening the DIB. There is, of late, growing criticism and doubt about the efficiency of defence offsets in India, which has resulted in toning down of offsets in the defence procurement procedure 2018. This thesis focuses on establishing whether defence offsets are a potent policy tool for strengthening the DIB in India, and the problems and prospects thereof. This is important, because close to billions of dollars' worth of defence offsets are in the pipeline over the next ten years and this opportunity can be utilized by the nation to build a robust DIB, if correctly leveraged.

In the course of this examination, four different aspects of the issue at hand have been analysed and researched, which are comparatively uncharted so far. Firstly, the offset experience of six nations, with similar beginnings as India, has been examined by extrapolating their import-export data over the four decades during which they solicited offsets. Four of these six nations have become key arms exporters. This established the efficacy of defence offsets as an effective policy tool. While examining these nations, certain parameters were identified for measuring the success of offsets. These evaluations parameters, their inter se relationship and their relative weightages were established and put through a survey which sought comments and suggestions from specialists and analysts. This evaluation framework is a comparatively new effort in the field of defence offsets and needs further exploration.

The second aspect is the evaluation of the performance of defence offsets in India from 2005 to 2018, where it emerges that while exports have marginally picked up, but unlike the other nations examined, our defence imports remain at sixty-five to seventy percent making India one the largest importer of arms. Thus evidence emerges that Indian offsets have underperformed. The study identifies reasons for the same and a critical examination of the AgustaWestland VVIP helicopters offset contract reinforces the findings. Further, a detailed survey employing evaluation parameters identified in the study, re-affirm our findings with respect to Indian offsets. The survey also confirms that defence offsets can be effectively leveraged, given the right environment.

Besides defence offsets, nations have leveraged licensed production also to develop an indigenous DIB. An examination of Indian licence production contracts leads us to conclude that even these have failed to seed technology in the DIB. This indicates a systemic malaise and to identify the missing link, a comparative analysis of these six nations and India in light of certain key barometers such as Global Innovation Index, Global Competitive Industrial Performance Index, Human Resource Index, Global Skill Ranking etc is revealing. As most of these nations were better placed in these indices thereby providing an enabling ecosystem for effective leveraging of defence offsets. Research on this aspect has yielded evidence that there is a need for a supportive defence ecosystem embedded in the National Innovation System. This insight is also comparatively unexplored in existing literature.

The fourth contribution of this research, are the linkages drawn out between defence procurements and R&D with the Defence Industrial Ecosystem. Defence Procurement Policy tools such as offsets can be leveraged into strengthening the NIS, which automatically will impact the defence industrial ecosystem. Drawing from global

experience, a model defence ecosystem for India has been suggested. While the above findings venture into new areas, this research has also established the urgent need for transformational and innovative reforms, the need for specialists in management of DIB as well as greater transparency, efficient data mining and data banks on the DIB. Inadequate data availability for this research on defence offsets has been overcome to some extent by extraction of data from existing literature, Comptroller and Auditor General reports, Ministry of Defence annual reports, reports to the Parliamentary Committee on Defence, and the Ministries of Science and Technology and Commerce and Industry. Most of the research carried out was qualitative in nature. Due to the type of the subject, the approach adopted was to establish basic percepts through primary and secondary research, and re-affirm findings by way of surveys and interviews. Numerous interactions and conversations with specialists during seminars assisted in firming up and confirmation of findings.

सार

रक्षा ऑफसेट काउंटरट्रेड का एक रूप है जो विश्व स्तर पर 140 से अधिक देशों द्वारा मांगा जाता है। मुख्य अनुबंध के मूल्य के प्रतिशत के रूप में विदेशी निर्माताओं से हथियार आयात करने वाले राष्ट्रों द्वारा इसकी मांग की जाती है। ऐसे पर्याप्त उदाहरण हैं जहां रक्षा ऑफसेट ने स्वदेशी रक्षा औद्योगिक आधार (डीआईबी) के निर्माण में राष्ट्रों की सहायता की है। दूसरी ओर, इतनी ही संख्या में राष्ट्र रक्षा ऑफसेट का प्रभावी ढंग से लाभ उठाने में विफल रहे हैं। भारत ने डीआईबी को मजबूत करने के उद्देश्य से 2005 में एक नीति उपकरण के रूप में रक्षा ऑफसेट को अपनाया। हाल ही में, भारत में रक्षा ऑफसेट की दक्षता के बारे में आलोचना और संदेह बढ़ रहा है, जिसके परिणामस्वरूप रक्षा खरीद प्रक्रिया 2018 में ऑफसेट को कम किया गया है। यह थीसिस यह स्थापित करने पर केंद्रित है कि क्या रक्षा ऑफसेट को मजबूत करने के लिए एक शक्तिशाली नीति उपकरण है। भारत में डीआईबी, और उसकी समस्याएं और संभावनाएं। यह महत्वपूर्ण है, क्योंकि अगले दस वर्षों में अरबों डॉलर मूल्य के रक्षा ऑफसेट पाइपलाइन में हैं और इस अवसर का उपयोग राष्ट्र द्वारा एक मजबूत डीआईबी बनाने के लिए किया जा सकता है, अगर सही तरीके से लीवरेज किया जाए।

इस परीक्षा के दौरान, इस मुद्दे के चार अलग-अलग पहलुओं का विश्लेषण और शोध किया गया है, जो अब तक तुलनात्मक रूप से अज्ञात हैं। सबसे पहले, भारत के समान शुरुआत वाले छह देशों के ऑफसेट अनुभव की जांच चार दशकों में उनके आयात-निर्यात डेटा को

एक्सट्रपलेशन करके की गई है, जिसके दौरान उन्होंने ऑफसेट की मांग की थी। इन छह देशों में से चार प्रमुख हथियार निर्यातक बन गए हैं। इसने एक प्रभावी नीति उपकरण के रूप में रक्षा ऑफसेट की प्रभावकारिता को स्थापित किया। इन राष्ट्रों की जांच करते समय, ऑफसेट की सफलता को मापने के लिए कुछ मापदंडों की पहचान की गई थी। इन मूल्यांकन मापदंडों, उनके परस्पर संबंध और उनके सापेक्ष महत्व को स्थापित किया गया और एक सर्वेक्षण के माध्यम से रखा गया जिसमें विशेषज्ञों और विश्लेषकों से टिप्पणियां और सुझाव मांगे गए। यह मूल्यांकन ढांचा रक्षा ऑफसेट के क्षेत्र में एक तुलनात्मक रूप से नया प्रयास है और इसमें और अन्वेषण की आवश्यकता है।

दूसरा पहलू 2005 से 2018 तक भारत में रक्षा ऑफसेट के प्रदर्शन का मूल्यांकन है, जहां यह उभर कर आता है कि निर्यात में मामूली वृद्धि हुई है, लेकिन अन्य देशों की जांच के विपरीत, हमारा रक्षा आयात पैसठ से सत्तर प्रतिशत पर बना हुआ है, जिससे भारत बना है। हथियारों का सबसे बड़ा आयातक। इस प्रकार इस बात के प्रमाण सामने आते हैं कि भारतीय ऑफसेट्स ने कमजोर प्रदर्शन किया है। अध्ययन उसी के कारणों की पहचान करता है और अगस्ता वेस्टलैंड वीवीआईपी हेलीकॉप्टर ऑफसेट अनुबंध की एक महत्वपूर्ण जांच निष्कर्षों को पुष्ट करती है। इसके अलावा, अध्ययन में पहचाने गए मूल्यांकन मापदंडों को नियोजित करने वाला एक विस्तृत सर्वेक्षण, भारतीय ऑफसेट के संबंध में हमारे निष्कर्षों की पुष्टि करता है। सर्वेक्षण यह

भी पुष्टि करता है कि सही वातावरण को देखते हुए रक्षा ऑफसेट का प्रभावी ढंग से लाभ उठाया जा सकता है।

रक्षा ऑफसेट के अलावा, राष्ट्रों ने स्वदेशी डीआईबी विकसित करने के लिए लाइसेंस प्राप्त उत्पादन का भी लाभ उठाया है। भारतीय लाइसेंस उत्पादन अनुबंधों की एक परीक्षा हमें इस निष्कर्ष पर पहुंचाती है कि ये भी डीआईबी में प्रौद्योगिकी को बीजित करने में विफल रहे हैं। यह एक प्रणालीगत अस्वस्थता को इंगित करता है और लापता लिंक की पहचान करने के लिए, कुछ प्रमुख बैरोमीटर जैसे ग्लोबल इनोवेशन इंडेक्स, ग्लोबल कॉम्पिटिटिव इंडस्ट्रियल परफॉर्मेंस इंडेक्स, ह्यूमन रिसोर्स इंडेक्स, ग्लोबल स्किल रैंकिंग आदि के आलोक में इन छह देशों और भारत के तुलनात्मक विश्लेषण से पता चलता है। चूंकि इनमें से अधिकांश राष्ट्र इन सूचकांकों में बेहतर स्थिति में थे, जिससे रक्षा ऑफसेट के प्रभावी लाभ के लिए एक सक्षम पारिस्थितिकी तंत्र प्रदान किया गया। इस पहलू पर शोध से इस बात के प्रमाण मिले हैं कि राष्ट्रीय नवाचार प्रणाली में अंतर्निहित एक सहायक रक्षा पारिस्थितिकी तंत्र की आवश्यकता है। यह अंतर्दृष्टि भी मौजूदा साहित्य में तुलनात्मक रूप से बेरोज़गार है।

इस शोध का चौथा योगदान रक्षा खरीद और रक्षा औद्योगिक पारिस्थितिकी तंत्र के साथ अनुसंधान एवं विकास के बीच संबंध हैं। रक्षा खरीद नीति उपकरण जैसे ऑफसेट का उपयोग एनआईएस को मजबूत करने में किया जा सकता है, जो स्वचालित रूप से रक्षा औद्योगिक पारिस्थितिकी तंत्र को प्रभावित करेगा। वैश्विक अनुभव से आकर्षित होकर, भारत के लिए एक

मॉडल रक्षा पारिस्थितिकी तंत्र का सुझाव दिया गया है। जबकि उपरोक्त निष्कर्ष नए क्षेत्रों में उद्‌यम करते हैं, इस शोध ने परिवर्तनकारी और नवीन सुधारों की तत्काल आवश्यकता को भी स्थापित किया है, डीआईबी के प्रबंधन में विशेषज्ञों की आवश्यकता के साथ-साथ अधिक पारदर्शिता, कुशल डेटा माइनिंग और डीआईबी पर डेटा बैंक।

रक्षा ऑफसेट पर इस शोध के लिए अपर्याप्त डेटा उपलब्धता को कुछ हद तक मौजूदा साहित्य, नियंत्रक और महालेखा परीक्षक की रिपोर्ट, रक्षा मंत्रालय की वार्षिक रिपोर्ट, रक्षा पर संसदीय समिति की रिपोर्ट, और विज्ञान और प्रौद्योगिकी मंत्रालय से डेटा निकालने से दूर किया गया है। और वाणिज्य और उद्योग। किए गए अधिकांश शोध प्रकृति में गुणात्मक थे। विषय के प्रकार के कारण, अपनाया गया दृष्टिकोण प्राथमिक और माध्यमिक अनुसंधान के माध्यम से बुनियादी अवधारणाओं को स्थापित करना था, और सर्वेक्षण और साक्षात्कार के माध्यम से निष्कर्षों की पुष्टि करना था। संगोष्ठियों के दौरान विशेषज्ञों के साथ कई बातचीत और बातचीत ने निष्कर्षों की पुष्टि और पुष्टि करने में सहायता की।

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LIST OF ACRONYMS

APC	Armoured Personnel Carrier
BAE	British Aerospace
BEL	Bharat Electronics Limited
BIS	Bureau of Industry and Security, USA
CAG	Comptroller and Auditor General
CENJOWs	Centre of Joint Warfare Studies
CEO	Chief Executive Officer
CGDA	Controller General of Defence Accounts
CII	Confederation of Indian Industry
CLAWS	Centre of Land Warfare Studies
CNC	Contract Negotiation Committee
COTS	Commercial of the Self
DA	Dassault Aviation
DAE	Department of Atomic Energy
DIB	Defence Industrial Base
DOFA	Defence Offset Felicitation Agency
DOS	Department of Science
DOMW	Defence Offsets Management Wing
DPP	Defence Procurement Policy
DPSU	Defence Public Sector Undertakings
DRAL	Dassault Reliance Aerospace Limited
EU	Europe Union
FDI	Foreign Direct Investment
FICCI	Federation of Indian Chambers of Commerce
GERD	Gross Expenditure on R&D
GDP	Gross Domestic Produce
GOI	Government of India
HAL	Hindustan Aeronautics Limited
HR	Human Resource

HVF	Heavy Vehicle Factory, Avadi, Chennai
IAF	Indian Air Force
IDTC	Independent Defence Technology Committee
IDSA	Institute of Defence and Strategic Analysis
IGA	Inter Government Agreement
IPR	Intellectual Property Rights
IIT	Indian Institute of Technology
IOP	Indian Offset Partner
IT	Information Technology
INR	Indian Rupee
JV	Joint Venture
L&T	Larsen and Turbo Limited
L1	Lower One (the vendor with the lowest quote)
MOU	Memorandum of Understanding
MOST	Ministry of Science and Technology
MOA	Memorandum of Agreement
MMRCA	Medium Multi Role Combat Aircraft
MoD	Ministry of Defence
MSMEs	Micro Small and Medium Enterprises
MRO	Maintenance Repair and Overhaul
MNCs	Multi-National Companies
NIS	National Innovation System
NATO	North Atlantic Treaty Organisation
OFB	Ordinance Factory Board
OEM	Original Equipment Manufacturer
OP	Offset Provider
PIL	Public Interest Litigation
R&D	Research and Development
RFP	Request for Proposal
RFI	Request for Information
SEZ	Special Economic Zone
SIPRI	Stockholm International Peace Research Institute
S&T	Science and Technology

SMEs	Small and Medium Enterprises
ToT	Transfer of Technology
TOEC	Technical Offset Evaluation Committee
TOC	Technical Oversight Committee
UNIDO	United Nations Industrial Development Organisation
VVIP	Very Very Important Person
VOS	Value of Sales
WIPO	World Intellectual Property Organisation
WW-II	World War II