IMPACT OF OFFSET POLICY ON INDIA'S DEFENCE INDUSTRIAL CAPABILITY AND POLICY ISSUES

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INTRODUCTION

The Indian Ministry of Defence (MoD) introduced the offsets provisions in its Defence Procurement Procedure 2005 (DPP-2005)[1] for capital acquisition schemes exceeding an estimated cost of Rs. 300 crore i.e. around $ 66 million. Its scope, the obligation and role of the Defence Offset Facilitation Agency (DOFA) and the modality for finalising offsets contracts and monitoring implementation thereof were indicated therein.

The subsequent changes in the offset policy in DPP 2006[2], 2008[3], 2009[4] included provision for credit banking,[5] delineation of defence products,[6] and relaxation in the licensing requirements.

DPP-2011[7] makes a substantial leap from the earlier stipulation of direct offsets by including dual use civil aerospace products and homeland security

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1. DPP-2005, http://mod.nic.in.
2. Ibid.
3. Ibid.
4. Ibid.
5. DPP-2011, http://mod.nic.in, p. 57.
6. Ibid., p. 55).
7. http://mod.nic.in.

items,[8] thereby ushering indirect offsets in a limited way. It also makes a definitive policy statement for progressives indigenisation in crucial areas with a view to improving our Self-Reliance Index (SRI) in acquisition of equipment, platforms and weapon systems, and ensuring a level playing field for the private sector, including private shipbuilding companies.[9] DPP-2011 was soon followed up with a Defence Production Policy[10] document which outlines the roadmap for indigenisation.

With such an evolving offset policy, this paper examines its **impact during 2005-10 in** bolstering defence industrial capability and self- reliance, and its stated objectives.

INDIA'S MILITARY INDUSTRIAL COMPLEX

India's military industrial complex consists of nine Defence Public Sector Undertakings (DPSUs), 40 Ordnance Factories (OFs), 50 Defence Research and Development Organisation (DRDO) labs, 140 private defence companies, and 5,000 Small and Medium Enterprises (SMEs) involved in production of around 450 items.[11]

Product Range

The nine DPSUs are engaged in the manufacture of products like helicopters, fighters, warships, submarines, patrol vessels, heavy vehicles and earthmovers, missiles and a variety of electronic devices, alloys and special purpose steel.[12]

The 40 OFs are engaged in production of small arms and ammunition of all the weapon systems, armoured and transport vehicles.[13] A very high degree of self-reliance has been achieved in these areas except in the area of artillery guns of 155 mm calibre where the Army is still groping to fill up the void in the towed and wheeled category – thanks to the Bofors imbroglio. This acquisition is fortunately in the pipeline.

8. DPP-2011, p. 56.
9. DPP-2005, http://mod.nic.in.
10. http://mod.nic.in.
11. Annual Reports, MoD.
12. Ibid.
13. Ibid.

Production Capability

The DPSUs and OFs have built substantial production capability largely through licence agreements (Buy & Make) for tanks, Infantry Combat Vehicles (ICVs), missiles, frigates, submarines, aircraft and electronic devices. The **overall value addition of DPSUs hovers around 37 percent. Midhani is a healthy exception** (57 percent) where substantial self-reliance in several critical materials like titanium alloys, manganese steel, special steel alloys, nickel base and cobalt base, super alloys and niobium-hafnium required by strategic sectors and programmes has been achieved.[14]

In the case of **OFs,** the **value addition is substantial** (85 percent), possibly because of the lesser technology depth of land systems compared to fighters and submarines.

Even amongst the naval platforms, value addition in submarines is substantially less (23 percent) than patrolling vessels (37 percent).

The value addition of each product would, however, depend on the stage of technology absorption.

An overview of the performance of the DPSUs and OFs is placed below as Table 1.

Table 1: Financial Performance of DPSUs/OFs (2009-10) (Rupees in crores)

DPSU	VOP	VOS	PAT	ADDITION
HAL	13,489	11,456	19,674	39%
BEL	5,247	5,219	7,208	41%
BEML	3,708	3,537	222.8	39%
MDL	2,856	3,150	240.1	23%
GRSE	870.7	424.2	114.8	35%
GSL	866	472.9	130.7	37%
MIDHANI	373	371	44,6	57%
BDL	631.6	627	33.7	50%
HSL	608	618	2.3	-
TOTAL	28,649.3	25,893.1	3,477.2	38%
OFS	11,817	8,715	--	85%
Grand Total	40,466.3	34,610.1	3,477.2	

Source : Annual Report, MoD.

14. Annual Report, Midhani (2009).

In other words, the **value of sales of DPSUs and OFs is of the order of $7.7 billion, with profit after tax to sales a healthy 13 percent for the DPSUs.**

DRDO

The 50 Defence Research and Development Organisation (DRDO) labs are dedicated towards progressive enhancement of self-reliance of defence systems and enhancement of Research and Development (R&D) infrastructure and capability of the country. [15]

Some of the major strides towards making the country self-reliant in the areas of military technology are:

- Prithvi (surface-to-surface missile) in the ranges of 150 and 250 km.
- Agni-I (surface-to-surface missile) with a range of 700 km.
- Akash (surface-to-air) missile with 25 km range.
- Brahmos (supersonic cruise missile) – a Joint Venture (JV) product of India and Russia.
- Light Combat Aircraft (LCA) Tejas, whose Initial Operational Clearance (IOC) is scheduled for December 2011.
- Battlefield surveillance radar – short range, phased array radars.
- Electronic warfare programme for the Army (Samyukta) and Navy (Sangraha).
- Multi-barrel rocket system (Pinaka) in the 37.5 km range.
- Hull mounted sonars HUMSA (NG).
- Torpedo Advanced Light (TAL) MK-1.

The value of systems/products/technologies developed by DRDO and included into the services is in the range of $11 billion.

PRIVATE SECTOR PARTICIPATION

Consequent on the opening up of the defence industry sector in May 2001, allowing the Indian private sector participation, with a Foreign Direct Investment (FDI) cap of 26 percent, a number of JVs have mushroomed between Indian and foreign companies. Major private sector industries and SMEs are also actively

15. Annual Report, MoD.

engaged as suppliers, fabricators and designers to DPSUs and OFs, accounting for 17 percent of outsourcing.[16] They are also closely associated with strategic programmes like Arihant, Dhanush, Brahmos and Pinaka. However, they are rarely system integrators or recipients of technology. The Buy & Make (Indian) option in 2009 would provide them a window to Transfer of Technology (TOT)[17] which was the exclusive preserve of DPSUs/OFs.

They are now into production of Fast Patrol Vessels (FPVs) and Inshore Patrol Vessels (IPVs) and competing with defence shipyards thanks to the level playing field provided in the Shipbuilding Procedure.[18]

MILITARY CAPABILITY

It is estimated that **15 percent of India's defence equipment is state-of-the art** while around 50 percent is obsolete. A comparison of our military hardware capability vis-a-vis our major adversaries is placed below (Table 2).

Table 2: Military Capability

	China	India	Pakistan
MBTs	6,500	4,047	2,461
Artillery	17,700	11,258	4,249
Submarines	65	16	8
Frigates	52	12	7
Aircraft	1,617	632	383
FGA	283	536	104
Defence Budget	$70.3B	$36B	$4B

Source: *Military Balance*, 2010.

SELF-RELIANCE INDEX

Despite such an impressive indigenous capability, the self-reliance quotient has remained around 30 percent for quite some time. The SRI Committee under Dr. Kalam had set a target of improving the Self-Reliance Index from 0.3 (1995) to 0.7 by 2005.[19] This has remained a pipedream. The Defence Expenditure Review Committee (2009) makes a strong case for drawing up

16. Reply to Parliamentary Standing Committee on Defence (2009-10).
17. DPP-2009, http://mod.nic.in.
18. DPP-2011, http://mod.nic.in.
19. SRI Committee Report – Prof Amitabh Malik (Member Secretary).

a self-reliance roadmap for attaining the goal of 70 percent indigenisation in a 15–20 year time-frame.[20]

Our track record, particularly in critical areas like propulsion systems, weapons and sensors remains abysmally poor. Even for aerograde material used for fuselage by fighters[21] and high quality steel required by frigates, submarines and aircraft carriers,[22] our dependence on imports is around 90 percent. Some of these critical technologies are listed below in Table 3.

Table 3: Critical Technology

1	Gas Turbine Engine	Single Crystal
		Special Coating
		FADEC
2	Missile	Uncooled FPA Seekers
3	Aeronautics	Smart Aerostructures
		Stealth Technology
4	Material	Nano Material, Carbon Fibres
5	Naval Systems	Super Cavitating Technology
6	Sensors	AESA, Radar, RLG, INGPS
7	Communication	Software Defined Radio
8	Avionics	Gen III, II Tubes
9	Surveillance	UAVs, Satellites

The Standing Committee on Defence (15th Lok Sabha) has sardonically observed that "achieving self-reliance in defence equipment is a distant dream" and has strongly recommended R&D in all defence production to be strengthened and private industries to share the responsibility of indigenisation and self-reliance in defence production.[23]

DEFENCE PROCUREMENT POLICY, OFFSETS AND SELF-RELIANCE

The Defence Acquisition Council, chaired by the Raksha Mantri (RM), with all the Service Chiefs and Secretaries in the Ministry of Defence (MoD) as members, **decides on the Long-Term Perspective Plan (LTIPP)**, identifies make projects and categorises acquisitions into Buy, Buy & Make, and Buy & Make (Indian). **Categorisation is critical for bolstering self-reliance as it**

20. Defence Expenditure Committee Report (2009).
21. Source: HAL.
22. 15-year Indigenisation Plan (Navy) (2003).
23. Report of the Expert Committee, DRDO, August 1998.

is only through the Make, Buy & Make, and Buy & Make (Indian) routes that the Self-Reliance Index can be improved.

There is, however, **simmering criticism that the Services plump for only the Buy option, with the Make category given short shrift**. Its fructification flows through a tortuous route.[24] Even financial assistance earmarked for Make projects to the private sector is yet to be availed of.

DRDO's unflattering **track record** in terms of timelines to design and develop major programmes like the **Kaveri**, **LCA** and **Main Battle Tank (MBT)** has given **added impetus to the import option**.[25]

It would be of interest to note that the MoD's procurement policy never flagged improvement in indigenous defence capability as a thrust area till 2011. In marked contrast, the policy statements of countries like Japan, China and South Korea have always rooted for indigenisation as a thrust area. Unsurprisingly, Malaysia improved its share in the defence market from 28 percent in 1997 to around 45 percent the next year by absorbing technology flowing through offsets during 1991-98.[26]

The offset policy of 2011 has, therefore, brought in a whiff of fresh air by affirming progressive indigenisation in crucial areas as a national commitment. However, the decision to include civil aerospace products in the policy ambit has drawn criticism from some quarters as it is likely to nullify the very rationale of the offset policy and deprive the nascent defence industry of development.[27]

The Defence Production Policy (2011)[28] is a watershed policy statement for achieving substantive self-reliance in design, development and production of equipment, platforms and weapon systems by creating conditions for the private sector and carving out a funding mechanism.

IMPACT OF OFFSET POLICY ON DEFENCE INDUSTRIAL CAPABILITY

There has been a significant spurt in acquisition by the Indian Air Force

24. DPP-2008, p. 157-162.
25. Rama Rao Committee Report (2008).
26. Kogila Balakrishna and Ron Mathews, "The Role of Offsets in Malysian Defence Industrialization," *Defence & Peace Economics*, vol. 20(4), 2009, pp. 341- 358, V.N. Srinivas, *Defence Offsets* (New Delhi: Knowledge World, 2010).
27. Ajay Shukla, "Moments of Truth for Defence Offsets," December 14, 2010.
28. www.mod.nic.in

(IAF) and Navy in recent years, the major acquisition contracts signed being the MiG-29 (upgrade) (Rs. 3,856 crore), medium lift helicopters (Rs. 5,600 crore), C-130 J aircraft (Rs. 366 crore) and Long Range Maritime Recce Anti-Submarine Warfare (LRMRASW) aircraft for the Navy (Rs. 10,684 crore).[29] The trend of capital acquisition expenditure is placed at Table 4.

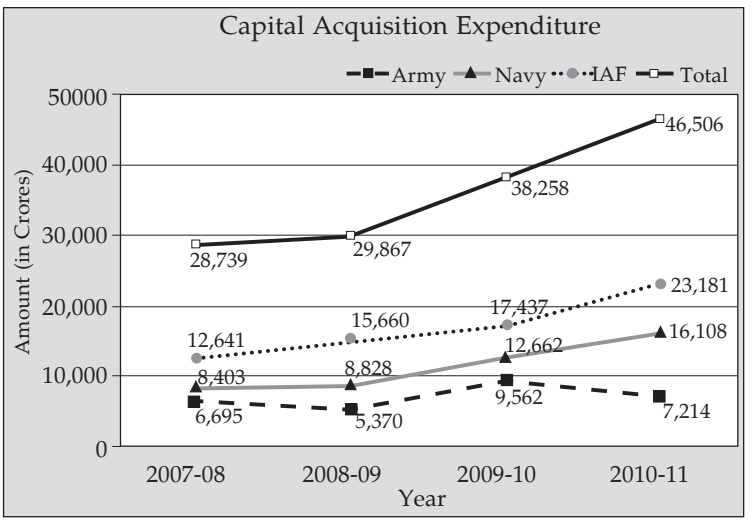
Table 4: Capital Acquisition Expenditure

Service	2007-08	2008-09	2009-10	2010-11
Army	6,695	5,370	9,562	7,217
Navy	8,403	8,828	12,662	16,108
IAF	12,641	15,660	17,437	23,181
TOTAL	**28,739**	**29,867 (0.4%)**	**38,258 (27.4%)**	**46,506 (21%)**

Source: Defence Service Estimate MoD & MoD (Finance/Budget).

The trend analysis is as under (Fig 1).

Fig 1: Capital Acquisition Expenditure



The broad details of the 12 acquisition programmes concluded with foreign companies with their contract value and offset contract value are placed as Table 5 below.

29. DOFA, DDP.

Table 5: Offset Cases: Contracts Finalised (2005-10)

Sr. No	Acquisition Programmes	Foreign Companies	Contract Value (In crores)	Offset Contract (In crores)
1	Medium Power Radar (Contract signed on Oct 16, 07)	IAI ELTA Israel	810	243
2	Upgrade of MiG-29 aircraft for IAF (Contract signed on Mar 07, 08)	ROE, Russia	3,856	1,233
3	Fourth Fleet Tanker (Contract finalised on Apr 23, 08)	Fincantieri, Italy	800	240
4	Long Range Maritime Recce Anti-Submarine Warfare Aircraft (Contract finalised on Jan 01, 09)	Boeing, USA	10,684	3,205
5	HAROP Unmanned Aerial Vehicles (UAVs) (Contract signed on Feb 13, 09)	IAI, Israel	720	220
6	Medium Lift Helicopters (Contract signed on Dec 05, 08)	Rosoboron Export, Russia	4,950	1,485
7	C-130 J Aircraft (Contract signed on Mar 31, 09)	Lockheed Martin, USA	3,666	1,100
8	EO/ IR Pods – Jaguar upgrade (Contract signed on Feb 06, 09) * The actual value of contractual offset obligations is Rs. 105 crore but over the offset contract signed.	RAFAEL, France	350	159
9	Fourth Fleet Tanker - under option clause (Contract finalised on 09)	Fincantieri, Italy	800	240
10	Low Level Transportable Radar (LLTR) (Contract finalised on July 29, 09)	M/s Thales, France	570	171
11	VVIP Helicopters (Contract signed on Feb 08, 10)	M/s Agusta Westland UK	4,227	1,268
12	UAV	M/s IAI	1,265	379
	Total		**32,698 cr.**	**9,943 cr.**

Source: DOFA, MoD.

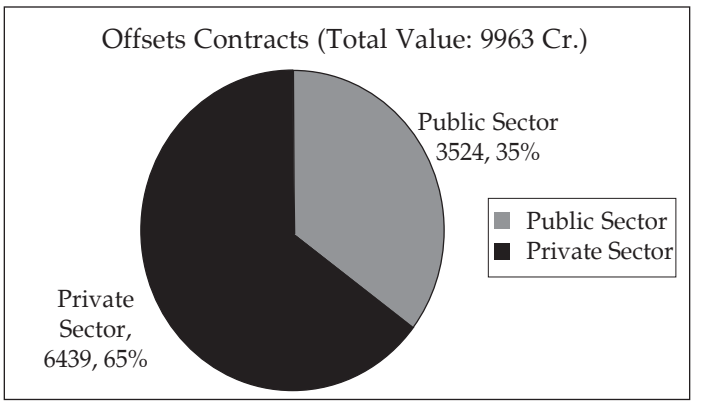
The major beneficiaries of the offset arrangements in the public and private sector are placed as Table 6.

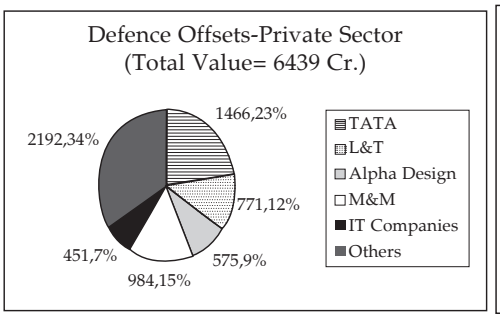
Table 6: Beneficiaries of Offset Contracts (Rupees **in Cr.)**

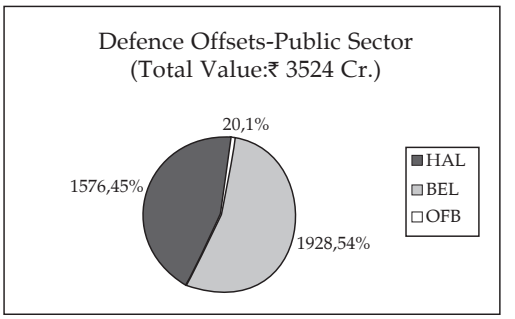
Entity	No. of contracts	Value
HAL	6	1928
BEL	6	1576
TATA	4	1466
L & T	7	771
ALPHA DESIGN	2	575
M & M	1	984
HCL	1	235
WIPRO	1	216

Source: DOFA, MoD.

A pie chart showing an overview of contracts amongst private and public players is placed below (Fig. 2):







The Highlights of Offset Contracts

- Steady increase from $48.6 million in 2007 to $519.5 million in 2008, $974 million in 2009 to around $700 million during 2010.
- The aerospace sector accounts for 65 percent and the balance by the other Services.
- Level playing field concern has been turned on its head as the Indian private industry accounts for 70 percent in value of these contracts.
- The DPSUs viz. HAL and BEL, and Tatas and L&T from the private sector, are major players.
- The SMEs and Information Technology (IT) companies also have a fairly handsome share and invest well is R&D.
- There is no positive impact on exports.
- In terms of FDI inflow, for infrastructure, production and R&D, the impact so far is minimal.
- Only one case of credit banking has been approved so far, with seven in the pipeline for a long time.

The major area of offset realisation is sub-contractisation (58 percent) involving supply of fuselage, cabins, radome, tail cone, data link and engineering projects for the P-81 aircraft programme followed by **overhaul and repair facilities** and **various types of training facilities and simulators**

Table 7: Types of Offset Contracts

Manufactured Final Assembly 58%
Simulators, Training Centre 18%
MRO 16%
GHE/GSE 8%

Source: DOFA, MoD.

AEROSPACE SECTOR

The aerospace sector has been the prime beneficiary of offsets since the beginning as most countries source their fighter aircraft like the F-5, F-15,

F-16 and F-18 from the USA, with varying degrees of offset obligations. Besides, aerospace goods provide multi-dimensional benefits; as high technological products are characterised by oligopoly, a rationale exists for bargaining to ensure flexibility in prices.[30]

The USA accounts for nearly 60 percent of global arms production which was around $471 billion during 2008. Of the 100 major global arms producing companies, aerospace products account for nearly 80 percent.[31]

In India, the aerospace sector is a near monopoly of HAL. Through a series of licensed production arrangements with Russia for the MiG-21, MiG-27, MiG-29 and Su-30, it has achieved a high level of technology capability in combat aircraft, engines and Repair and Overhaul (ROH).[32] In the helicopter segment also, considerable expertise has been built up due to successful indigenous design and development of the Advanced Light Helicopter (ALH).

The TOT arrangements in the past, however, did not create defence industrial capability for supplying advanced weapons system that would be competitive with Western equipment. Nor has the technology gap closed.[33]

The types of work realised through offset arrangements in HAL are as under:

Table 8: Types of Offset Realisation in Aerospace Sector

1. Build to Print 32%
2. Design to Build 21%
3. MRO Facilities 27%
4. Software Packages 12%
5. Design Packages 8%

Source: HAL.

In the defence sector, it is contended that capability to undertake Maintenance, Repair and Overhaul (MRO), upgrade and assemble is the

30. Stephen Martin, *Counter Trade & Offsets: An Overview of Theory and Evidence* (Routledge), pp. 37-38.
31. *SIPRI Year Book*, 2010.
32. A. Bhaskaran, in Brauer and Dunne, eds., *Role of Offsets in Indian Defence Procurement Policy: Arms Trade and Economic Development* (Routledge), p. 220.
33. Ibid.

most basic level capability. In Malaysia, offsets have facilitated development of local MRO capacity.[34] Depot maintenance capability (MRO) is one of the key areas flagged by Dr. Kelkar for offset arrangements.[35] The offset contracts for the MiG-29 (upgrade) and VVIP helicopters, are in this genre. In the case of the 'Globe Master' contract, HAL is likely to benefit in terms of ROH facilities through offsets.[36]

Critics of the offset arrangements often contend that offsets come at an additional cost implication ranging between 4–15 percent[37] and that such sub-contractorisation would have come about even without the offset stipulation because of the cost-effectiveness in the developing countries.

A case in point is the export of empennage for the Su-30 to the Russians, where due to the lower Man-Hour Rate (MHR) in HAL i.e. $18 compared to Russia's MHR @ $45, the order was placed by the Russians on HAL, though TOT was passed on by them.[38] According to a study by the Boston Consulting Group, India's vast domestic market and relatively low cost workers, with advanced technical skills, will make it a manufacturing powerhouse within the next 5 to 10 years.[39]

GLOBAL TRENDS

Table 9: Global Trends in Offset Contracts

Direct Purchase	40%
Sub-Contract	24%
Technology Transfer	17.5%
Co-Production	7%
Credit Assistance	4%
Investment	4%
Training	2.3%
Licensed Production	0.6%

Source : GOCA, DMA (1993 – 2005).

34. Balakrishna and Mathews, n. 26.
35. Towards Strengthening Defence Preparedness, MOD, April 2005.
36. *Indian Express*, May 31, 2011.
37. Balakrishna and Mathews, n. 26.
38. MD(M) Nasik.
39. Shri J.D. Patil, VP, and Mathews L&T, Conference on Offsets, April 2007.

It would thus be seen that bulk of offsets (2/3rd) is for direct purchase and sub-contract. Investment and co-production arrangements get a secondary pie.

Countries like Malaysia have experienced that a high proportion of technology transfer is for training (58 percent), skill upgradation, MRO work (18 percent), manufacturing and sub-assembly (8 percent) with very little R&D flowing in (2 percent).[40]

In the US, for the 10,661 offset transactions reported with 50 countries during 1993-2009 involving $52.6 billion, direct offsets accounted for 37 percent and indirect offsets for 63 percent; 84 percent of these transactions involved sub-contracting, purchase and technology transfer. Though data on specific technology transferred is not available, it is unlikely that any nascent technology was transferred.[41]

Both China and Malaysia have become production hubs for many items like landing gears and pylons in the Original Equipment Manufacturers' (OEMs) global supply chain through technology transfer.

On the other hand, Far Eastern countries like Japan, South Korea and Taiwan have insisted on technology transfer rather than more production work through offsets.[42]

Lessons for India

These global experiences **hold important lessons for India for revisiting our offset policy in regard to FDI, technology transfer and indirect offsets.**

India has come to be recognised as an economic and technological powerhouse in the making. Manufacturing now accounts for above 27 percent of India's Gross Domestic Product (GDP), contributes 53 percent of total exports, 79 percent of FDI, and employs 11 percent of the workforce.[43] Sectors like Telecom, with a FDI limit of 74 percent has been receiving

40. Balakrishna and Mathews, n. 26.
41. US Department of Commerce, December 2010.
42. Martin, n. 30, p. 5.
43. n. 39.

significant FDI inflow (around $25 billion)[44] in the recent past despite the global financial crisis. It would, therefore, be useful to take stock of the trends in JV formation, credit banking and impact of offset contracts on Indian partners.

JV Arrangements

A few JV arrangements have taken place and a few are in the offing, predominantly in the private sector. Tatas are in the forefront with a tie-up with Lockheed Martin for aerostructures for the C-130-J and helicopter cabins with Sikorksy, titanium flow transfer with Boeing. Defence Land Systems with BAE systems are looking at design, production of artillery systems. L&T is tying up with EADS[45] and Samtel with Thales for flight display and tracking systems[46] and Alpha Technology with EADS for opto-electronic sensor systems for Electronic Warfare (EW) application and Rosobornexport for simulators.[47]

The foreign OEMs show a distinct predilection to partner with well known Indian private sector companies like Tatas, L&T, Mahindra & Mahindra rather than with DPSUs. Increasing **FDI limit is, therefore, critical for fostering such long-term investment decisions,** transferring production lines and making India a hub for various deliverables in their global supply chain**.**

Impact on Credit Banking

A provision of banking credit with the sunset and sunrise clause was introduced in DPP 2009. Of the eight proposals received, only one has been approved so far in respect of M/s. Eurocopter.[48] There has been unusual prevarication to finalise such banking arrangements. This has understandably embittered foreign OEMs like Lockheed Martin[49] as they look for an expeditious approval process. There is also a perception that

44. Economic Survey – 2010-2011.
45. "Defence & Aerospace Offset Policy & Practice," www.google.com, February 18, 2011.
46. E-mail dated May 8, 2011 from Georgarian Philip, Lockheed Martin.
47. Meeting with CEO, Alpha Technology.
48. DOFA, DDP.
49. E-mail.

the policy-makers are unnecessarily intransigent on the sunset and sunrise clause. Transfer of credit, though advocated by some, is a more complex issue.

Impact on Indian Partners

From the feedback received, it is seen that the offset arrangement has helped HAL and SMEs in skill upgradation, boosting exports and helping market penetration.

In the case of BEL, there is a significant impact on export. The position is tabulated below as Table 10.

Table 10: Impact of Offset Programmes on an Indian Company

Financial Parameter	HAL (2010)	BEL (2010)	ALPHA Design Tech. (2010)
Annual Turnover	13061 Cr.	5220 Cr.	72 Cr.
Profit (PBT)	2781 Cr.	1043 Cr.	3 Cr.
Impact			
More Profit	✓	No	✓
More Export	✓	✓ ($10.6 M)	✓
Creation of Jobs	✓	X	✓
Skilled Manpower	✓	X	✓
Skill Upgradation	✓	X	✓
(f) Sub-Contractor Base	✓	X	✓
Market Penetration	✓	X	✓
Future Business Opportunity	✓	X	✓

Based on response to questionnaire.

In terms of its impact on technology capability, offsets seem to have facilitated introduction of new products and registration of patents with a wide array of countries as summarised at Table 11 below.

Table 11: Impact on Technology Development Capability

Sr. No.	Type of Capability	BEL	Alpha Technology	Samtel Display
1	% Expenditure on New Technology	< 10%	41-50%	31-40%
2	R&D Expense	<10%	41-50%	21-30%
3	Patent Registered	(5)	No	(2)
4	Sourcing of Technology	Local & Foreign	Local & Foreign	Local & Foreign
5	Introduction of New Products	Yes	Yes	Yes
6	Countries with Offset Partnership	USA, France & Israel	Russia, Italy, Britain, Israel	France

Significantly, these SMEs are investing handsomely in R&D (20-40 percent), making them technically fleet-footed and more sure of absorbing leading edge technology. The Indian companies, therefore, need to invest more in R&D to spur foreign OEMs to collaborate in high technology products.

The private sector companies like Tatas, L&T and Pipavav, despite having excellent facilities, have an inherent handicap in terms of design and development capability and integration. Japan's success in fast technology absorption was largely due to its highly skilled personnel and low cost of labour.[50]

Offset Proposals in the Pipeline

It is estimated that 39 acquisition cases with offset expectation are in the pipeline involving around $10 billion.[51] The Medium Multi-Role Combat Aircraft (MMRCA) tender is the mother of all these proposals for an estimated offset opportunity of around $5 billion. This Request for Proposal (RFP) contains an offset obligation of 50 percent unlike the normal stipulation of 30 percent in our offset policy.

50. Chinworth and Mathew, *Defence Industries Through Offsets: Arms Trade and Economic Development* (Routledge, Japan).
51. DOFA, MoD.

The government is also in the process of finalising a contract for the heavy lift helicopter (Globe Master) from the USA in the Foreign Military Sales (FMS) route.[52] With an offset obligation of $1.25 billion, the prime beneficiary would be DRDO, which will have a high altitude engine facility and trisonic wind tunnel facility at a cost of $510 million. Presently, such tests are being done abroad.

HAL will also benefit in terms of repair and overhaul facilities and Tactical Communication System (TCS) for avionics and defence land systems in terms of armoured vehicles. These are significant add-ons in terms of defence capability.

While offset contracts are traditionally in the aerospace sector, a few big acquisitions for the Army for 155 mm wheeled and towed guns are likely to generate around $1.2 billion for the land systems.[53]

EXPERIENCE SO FAR AND POLICY ISSUES CHALLENGES

While offsets have helped in sub-contractorisation of low end products and services, setting up simulator and training facilities, engineering projects and depot maintenance capability, the response to **FDI, in production of R&D and JV arrangements has been rather lukewarm.** So is the case with exports, as the following Table 12 would reveal.

Table 12: Trend of Exports

Entity	2008-09	2009-10 (In Crores)
HAL	421	204.6
BEL	84	108.8
BEML	248	156.2
OFB	46	11.5
TOTAL	799	481.1

Source: Annual Report, MoD.

52. *Indian Express,* May 3l, 2011.
53 n. 45.

MAJOR POLICY ISSUES

FDI

The DIPP circulated an approach paper rooting for more than 74 percent FDI cap in defence production to offer significant incentives to foreign companies for transferring leading technology.[54] While the Confederation of Indian Industry (CII) and Federation of Indian Chambers of Commerce and Industry (FICCI) are generally guarded while recommending an increase to 49 percent, foreign OEMs are vociferous and recommend more than 74 percent. Dr. Kelkar and Deepak Parekh also recommend FDI higher than 49 percent if they bring in critical technology.[55] However, the present[56] and earlier Chief of Integrated Services Committee (CISC)[57] are of the view that the FDI limit is good enough to encourage JV arrangements. Chief Executive Officer (CEO) Sankhya[58] shares the same sentiments.

Countries like China had substantial increase in FDI inflow i.e from $5.8 billion (1990) to $67.3 billion in 2007 because of liberal FDI norms. A case in point is their JV with Embraer where 51 percent FDI was allowed.[59] In Malaysia also, the FDI varied between 30-70 percent,[60] depending on the quality of technology coming in. The JV arrangement with Russia for the Brahmos cruise missile is considered as a useful model. The JV model of the Brahmos with 50:50 FDI participation of India and Russia has been a success story and can be a model for the future needs of the nation.[61]

Dual Use Technology

It is too early to judge the impact on the civil aviation sector, consequent on the inclusion of this sector in DPP-2011. However, the indications are that it has generated enthusiasm, particularly for security related products,[62]

54. http:/dipp.nic.in/Discussion papers 17th May 2010.doc
55. Interview with Dr. Kelkar & Deepak Parekh, September 2010.
56. Reply from CISC.
57. E-mail – Admiral Puri.
58. E-mail – Sridhar Nadupalli.
59. Nelhie Yan, China's Search for Indigenous Industrial Development, Ph.D. Thesis, June 2009.
60. E-mail from Dr. K. Balakrishna.
61. E-mail from Dr. A.P.J. Abdul Kalam.
62. Sr. Adviser, HCL (Overseas).

aero structures and cabins. Japan has been the prime beneficiary of dual use technology in areas like electronics, cryptology, sensors, etc.

The Dr. Rama Rao Committee strongly advocates such technology for Air Traffic Control (ATC), imaging for agriculture, water and mineral resources, meteorological and oceanographic study and disaster warning.[63] In the area of flight display, avionics and inflight entertainment and propulsion systems, dual use technology will have excellent commercial spin-off.[64]

Malaysia's MoD has given primacy to promoting dual use items on priority.[65]

TECHNOLOGY TRANSFER

Inclusion of technology transfer for identified key technologies seems to be gaining wide support in the offset policy. Many DPSUs like HAL, BEL, BDL, MDL, Midhani have been recipients of technology, predominantly from Russia and a smattering of Western sources.

While substantial indigenisation has been achieved in non-critical technologies, in critical technologies, OEMs rarely provide manufacturing knowhow, leading to continued dependence on them for upgrades.[66] Prof. Brauer, a recognised expert, is also of the view that India being a big buyer of defence equipment, does not guarantee that counterpart countries will transfer the relevant technology.[67] Even if transferred, it can become obsolete by the time it is installed and absorbed. BEL's TOT for the Night Vision Device (NVD) is a case in point.

However, there have been exceptions. Key technologies like the single crystal blade for turbines was passed on by Russia and was successfully absorbed, making India a major destination for machining engine components of engine houses like Pratt & Whitney.[68]

63. Dr. Rama Rao Committee Report.
64. CEO, SAMTEL.
65. Balakrishna and Mathews, n. 26.
66. Director (R&D), BEL.
67. E-mail - Prof. J. Brauer, "Economic Aspects of Arms Trade," April 25, 2011.
68. GM, HAL, Koraput.

TECHNOLOGY TRANSFER, INDIGENISATION AND COST REDUCTION

Table 1.3

DPSU	PRODUCT	Indigenisation	Cost Saving
BDL	Milan	71%	60%
	Konkur	97%	30%
HAL	SU-30(Air Frame)	55%	45%
	AL31FP(SU-30 Engine)	65%	45%
	HAWK	40%	18%
Medak	ICV	90%	50%
Midhani	Titanium Alloys	60%	15%
BEL	Sonobuoys	70%	30%

Some economists suggest that obtaining technology through offsets is a more efficient way than direct purchase. When TOT is part of a large contract, the risk is shifted to the vendor who will have greater incentive to transfer the technology successfully.[69]

Multipliers

On the issue of multipliers, the Ministry of Defence seems to be against a dog in the manger policy. This is universally accepted, depending on the quality of offsets transferred.

Ironically, in the contract concluded by the Civil Aviation Ministry with Boeing and Airbus, the offsets contracts envisage multipliers of 2-5 in several areas.[70] The Tatas are getting the benefit of this offsets arrangement in aero structures and titanium floor beams.

With this backdrop, the civil shipbuilding could be considered for offsets. In the Report of the Prime Minister's (PM's) group on the growth of the Indian manufacturing sector, Shri Krishnamurthy had advocated the mission made approach for building domestic shipbuilding capability and new shipyards.

69. Martin, n. 30, p. 41.
70. Dir(CP) HAL.

Level Playing Fields

Some of the private players are clamouring for customs duty exemption on import and treating indigenous value additions as import substitution, on par with imports. Extending the Exchange Rate Variation (ERV) to private players is another demand.

Indirect Offsets

The key to the global competitiveness of India's economy lies in building high class infrastructures. In the telecom sector, there is great potential to manufacture items like wireless core equipment which is being imported through technology transfer.[71] **Indirect offsets can infuse much needed FDI into the infrastructure sectors** where the requirement is assessed as $1,025 billion during (2012-17).[72]

Cost Effectiveness

Economists like Paul Dunne[73] aver that the economic benefits of offsets are simply an excuse, and are unproven. Prof. Brauer calls for a full audit of each offsets contract.[74] Some critics consider defence offsets to be detrimental to the Services, with additional cost penalties of 10 percent for 50 percent offsets.[75] However, Bernard Udis' case study of the Swiss F-5 purchase reveals that a cost premium upto 10 percent is reasonable for a well established offset programme.[76]

The general conclusions, however, seem to be that:[77]

- The defence offsets are more expensive than off-the-shelf purchase.
- They create little by way of new or sustainable employment
- They do not make a substantive contribution to general economic development.
- No significant technology transfer takes place to either the civilian or military sector.

71. Economic Survey, 2010-2011.
72. Ibid.
73. E-mail, Prof. Paul Dunne, April 26, 2011.
74. E-mail, Prof. Brauer, April 25, 2011.
75. Maj. Gen. Suman, Defence Offset Proving Detrimental to the Services, *Indian Defence Review*, 2009.
76. Bernard Udi, *US-Swiss F-5 Transaction: Evolution of Swiss Offset Policy* (Routledge), p. 332.
77. "Defence Offsets," *Transparency International*, April 2010.

FUNCTIONING OF DOFA

There are also rumblings regarding the present functional arrangements of DOFA and its effectiveness. There is a strong case for a full-time monitoring and empowered agency with technical, legal and financial expertise.[78]

OTHER ISSUES

Making credit-banking provisions more flexible and not insisting on an offset realisation period being co-terminous with the supply contract period are issues that need to be revisited. In fact, as per global practice, OEMs are allowed to implement offsets agreement in 11 years.[79] Our policy seems to be unnecessarily sticky.

NATIONAL OFFSET POLICY

A discussion paper in October 2006 mooted having a national offset policy under the Ministry of Commerce. It preferred direct offsets by availing of high end technology through TOT and co-production. It also recommended indirect offsets by way of investment in the IT, telecom, bio technology, agricultural research and export promotion sectors. The paper, however, did not get an enthusiastic response from other ministries that consider such nodal initiatives dilatory.

CONCLUSIONS

The study reveals that while the perception of major stakeholders viz. Services, DPSUs, Indian private industry, foreign OEMs, think-tanks and policy-makers may be divided on several issues like indirect offsets, multipliers and transfer of credit, there is a general consensus on the following:

- Technology transfer should be included in the offset policy by identifying key technologies in the RFP.

78. Feedback from private industry.
79. Martin, n. 30, p. 41.

- Growth of the defence industry in high technology areas[80] and boosting fledging private industries[81] should be a priority for the government.
- As the TOT route may not provide key technology and knowhow,[82] design and development through the JV mode should be assiduously pursued.
- The FDI limit could be increased to 49 percent by ensuring that there is minimum value addition and investment in the country. The JV in the Brahmos case is a good example to emulate.[83]
- Investment in R&D by DPSUs and DRDO must be upscaled from the present level of 6 percent to around 10 percent.[84] The private sector must invest substantially in R&D to be able to absorb cutting edge technology.
- Value addition should be the thrust of both the private and public sectors and not mere integration/assembly.
- Protectionist bias towards DPSUs and OFs should be avoided.[85]
- In acquisition cases, credit banking should be finalised in a time-bound manner as it would send the right signals to foreign OEMs to collaborate.
- Our policy must abdicate its overly prescriptive and complex character.[86]
- In view of the specialised nature of leveraging the offsets strategy, setting up of a Standing National Task Force for offsets under the PMO should be seriously considered.[87]

80. Chairman, TCS, November 12, 2010.
81. AOC-IN-C, WC, August 5, 2010.
82. Admiral Raman Puri, CISC (Retd).
83. Dr. A.P.J. Abdul Kalam, Ex President.
84. Parliamentary Standing Committee.
85. Feedback from major private sector players.
86. E-mail, Prof. Ron Mathew, April 25, 2011.
87. Air Cmde Jasjit Singh (Retd), "Arms Trade Offsets: Key to Energise Defence Industry," *Air Power Journal*, Vol. 2, No. 1, Spring 2005 (January-March).