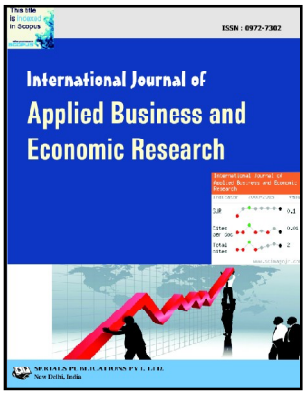

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Empirical Study on Make in India: The Defence Sector Perspective and The Way Ahead

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Abstract: September 2014 saw the launch of a bold visionary initiative by the Government named 'Make in India' aimed at bolstering manufacturing with foreign collaboration, which subsequently resulted in India emerging as the frontrunner for Foreign Direct Investment in the world. India's Defence budget allotment is approximately USD 34.53 Billion & an average USD 15 Billion is spent on arms import. Make in India initiative in Defence sector can result in saving approximately USD 15 billion annually, create job opportunities, mushroom budding talent, enhance self-reliance and pave way for India becoming prominent arms exporter in the new world order. The research is basically deductive in nature which broadly focuses from general to specific areas. Qualitative Research techniques such as Questionnaire, Interviews, Observations and archival data was used in the research for analysis purpose.800 respondents facilitated the survey. The data was subjected to exploratory factor analysis (using SPSS software) and checked for scale's internal reliability. The outcome of Chi-square test of Independence clearly indicated that Make in India initiative will be productive in Defence sector in long run.

Keywords: Make in India, Foreign Direct Investment, Defence, Joint Venture, Transfer of Technology.

1. INTRODUCTION

A nations survival is linked to its unique Defence industry which in turn makes available assets required for national security at all times. Hence, State plays an important role in growth &survival of its Defence industry. (Kopac, E,2006). The 21st Century has been designated as the era of knowledge and knowledge workers. In the sphere of military operations, classical fire and maneuver has been gradually replaced by Information & Intelligence. A vibrant Defence manufacturing sector can play a significant role in providing Technology Security to a nation. It has the potential to generate millions of jobs for our young work force, save billions of dollars being spent on acquisitions and through life cycle capability management besides

creating avenues for export by being cost competitive. In addition, most Defence technologies developed have significant applications in civil, internal security, disaster relief & would find use therein. In order to trail blaze this seemingly opaque work space, it is important that a Defence technology strategy is put in place outlining the priorities for research, funding, skill development, opportunities and collaboration.

India holds third largest military in the world and is also sixth biggest Defence spender. The 'Make in India' focuses on making India self-reliant by inhouse Defence manufacturing. This can be achieved by strategic partnership with foreign arms manufacturer with an aim to energize the domestic market and achieve ingress in global market. (Refer Table 1 of Appx).

India remains as the largest importer of arms with a bill of $ 60 billion in the past which is likely to increase by a factor of 2.5 times in next 8 years or so. (Refer Table 2 of Appendix). India's share of International Arms import grew up from 7% in 2007 to 15% in 2014. (Refer Table 2 of Appendix). Despite increase in the annual Defence budget allocation since 2010 onwards, India's GDP did not show a positive trend. (Refer Table 3 of Appendix). An increase of 30% capital expenditure saw a sharp 40% increase in revenue outlay from 2010 to 2015. (Refer Table 4 of Appendix). Recent reports by Confederation of Indian Industries have clearly highlighted the future potential growth of Indian Defence manufacturing sector in collaboration with foreign partners thus paving way for a million odd job creations in next decade.

2. LITERATURE REVIEW

Armed Forces as an organization serve multiple roles in tune with the national interest. (Kerbs,2004). With the changing International Relations, emergence of new Geo –Political-Economic threats confronting the nation, Armed forces have to align themselves with the inevitable change. (Baylis, J., Smith, S.,1997). There is an ongoing redefinition of their roles, organizations and financing (Forster A,2005). Defence industries play a vital role in meeting the demands of Armed Forces commiserating with the national security perspective.

With rampant globalization and ever-changing world order, the Defence industries too have undergone structural, policy related and operational changes to align themselves with the free market economy. The focus has now shifted towards mutual profit oriented joint ventures and sharing of technology in Defence manufacturing. (Kopac, E, 2006). National Defence industries could encourage the development of a technological base and modernization of the overall economy, generating growth. (Gansler ,1982 & Bitzinger, 2003).

Make in India is supporting a so-called strategic partnership model, in six sectors: aircraft and helicopters, warships and submarines, armored vehicles, missiles, electronics and command control systems, and critical materials. (Aroor S, 2017). However, there are contradictory views on similar initiative world over. Some philosophers give positive outlook towards resource allocation for Defence production and joint ventures, while others debate resource allocation to meet the challenges of education, medical facilities and creation of other infrastructure facilities. Huisken(1983) in a study pointed out that fund allocation for socio economic development vary from an arms producing nation to one which does not possess such setup.

The basic criticism against defense expenditures is that they represent a significant opportunity cost (Leontief & Duchin, 1983). Chan (1985) in his study has pointed out that increase in Defence expenditure

is complemented with income shift(Benoit,1972), lateral shift of talent to Defence industry, change in production base from civil to military & increasing the debt for an arm import focused nation. (Looney & Frederiksen, 1986).

Lim (1983) estimated a Harrod-Domar type model and concluded that defense spending is detrimental to economic growth' in developing countries. Smith (1980) model correlated direct impact of increased Defence expenditure with modernization of its Defence forces. Dabelko & McCormick (1977) focuses on the Government of the day with its attitude towards spending for Defence, health & education sectors. Deger & Smith (1983) brings out the decline in foreign reserves with increase in import oriented Defence expenditure.

The decline in agriculture output with increase in military expenditure was studied by Faini et al. (1984). He proved that with 1% rise in the military's share of Gross Domestic Product (GDP) was linked with 18% drop in the shares for agriculture. Tibbett et.al. (1997) focused on neglect of economic development with increased focus on Defence sector. Developing countries perceive national Defence industries, thus arms production, as a tool for sustaining guaranteed supply of arms (Evans, 1986), accessing high-technology systems and decreasing the influence of supplier states, all of which would increase their power position relative to other international actors. Defence industrialization in the developing countries portrays their motivations within the framework of the pursuit of power, wealth and prestige. Regarding the pursuit of power, developing states aim to decrease their dependency on supplier states and increase access to high technology towards designing a more capable military force. (Baðcý, H., & Kurç, Ç. ,2017).

The traditional model of Supply Chain management is now reshaping itself to meet demands of the customers by ensuring competitive cost without compromising the quality & service. (Arlbjorn et al., 2011). Outsourcing, Strategic partnerships are now dominating the manufacturing segment. (Gentry, 1996; Virum, 1993; Knemeyer et al., 2003; Wolf and Seuring, 2009; Stern et al., 1989, Welling and Kamann, 2001).

3. RESEARCH GAPS

Based on extensive literature review, research gaps which emerge are as follows:

(a) Studies identifying the factors responsible for slow production by Indian Public Sector Undertakings & Ordnance Factory to meet the aspirations of Armed Forces.

(b) Studies identifying the factors leading to delay in design, development and production of major ground, aerial and naval weapon platforms having technological edge by DRDO to meet the aspirations of Armed Forces.

(c) Studies identifying the reasons for lagging of Indian Defence Industry when compared to other nations.

(d) Studies identifying the actual reasons which led to Government launch of Make in India initiative to meet the aspirations of Armed Forces.

4. JUSTIFICATION OF RESEARCH

India is an emerging power both economically and in terms of military might. The GDP of the nation has grown and so has the foreign reserve exponentially since independence. But on sidelines, new threats both

internal and external have emerged which are challenging the state. The age-old PSU-OF& DRDO have not been able to match the technological advancement taking place worldwide, thereby resulting in voids in Defence inhouse state of the art production and providing our adversaries an avoidable upper edge. We are still following the age-old manufacturing methods which are outdated in terms of technology & hence have resulted in increased dependence on imports and ever sinking self-reliance on our own manufacturing industry. (Refer Table 8 of Appendix). The new initiative aims in increasing share of Defence manufacturing from the current level of 15% to 25% of GDP with an aim to achieve 70% self-reliance quotient with focus on technology transfer from foreign companies.

With India getting nominated as the most attractive worldwide by a recent survey (Refer Table 1 of Appx) and taking into consideration the 'Make in India' initiative, the budget allocation for three services of Armed Forces as well as their modernization budget for FY 2017-18 vis a vis FY 2016-17, has been increased by approximately 10% by the Government. (Refer Table 4, 6 & 7 of Appx). An added incentive could be an attractive Defence exports policy wherein foreign companies are allowed to export unlimited portion of their weapons production. As clearly projected (Refer Table 5 of Appx), the Defence spending in Asia Pacific region is going to increase manifolds.

5. CONCEPTUAL FRAMEWORK

The research takes into account the various concepts of Factor Analysis. Independent Variables considered were Infrastructure, Joint Ventures, Skill development, foreign exchange, net inflows of capital, external debt, human resource & States outlook. Dependent Variable considered were Institutional performance, Financial outcomes, Defence production, Job creation, Self-reliance & GDP. Moderating Variable were Rules and regulations, policies, programmes, initiatives, Schemes. Mediating Variables were Resource availability, Attitude, Financial soundness. Variation of growth with defence spending was studied.

6. HYPOTHESIS

The three hypotheses for the research are as follows:

(a) The Indian Public Sector Undertakings have not been able to meet the growing aspirations of Armed Forces in relation to changing security scenario of the country and in its neighborhood.

(b) There has been a quantum jump in the technological know-how and production of Defence related equipment worldwide & some nations possess certain cutting-edge technology which is required by India.

(c) The Make in India initiative in Defence sector will be able to generate employment, boost manufacture, carry out skill enhancement, pave way for self-reliance, reduce arms import and strengthen India's security in the new world order.

7. RESEARCH QUESTIONS

The questions that the research in its course will analyze are as follows: -

(a) Will 'Make in India' initiative lead country on the path of self-reliance in Defence sector?

(b) What will be the impact of revised Defense Procurement Policy 2016 in relation to Defence manufacturing sector?

(c) Will new routes be made available to aid procurement and manufacturing with foreign companies?

(d) Which key Defence modernization & manufacturing plans are envisaged under this initiative?

8. RESEARCH OBJECTIVES

General Objective: To assess whether the Make in India initiative for Defence Sector result in saving to the state, create jobs, support talent, enhance self-reliance and lead India in becoming major arms exporter.

Specific Objectives

(a) To identify the specific Defence segments where this initiative should be implemented.

(b) To determine the scope of Defence manufacturing that is to be executed by new players.

(c) To relate and implement various new projects in line with emerging security challenges.

(d) To define the limit of strategic partnership in Defence R&D projects and production.

(e) To make specific recommendations to ensure success of this initiative.

9. RESEARCH METHODOLOGY

9.1. Primary Data

Respondents. The main source of Primary Data were Officers with different service bracket (addressing the functional, directional and conceptual level) from Pan Armed Forces, PSU &OFB and Five Key Private Defence manufacturing companies to include TATA, L&T, Reliance, M&M, Kalyani Group. A sample size of 800 was taken and Questionnaire were floated. Interviews were also conducted.

Service / Organisation	*% of Respondent*	*Length of Service*		
		Less than 10-Years' service	*Service bracket : 10 -20 Years*	*Service bracket: 20 Years and above*
Pan Armed Forces	20% Junior Level	20	40	40
PSUs & OFBs	40% Middle Level	20	40	40
TATA, Reliance, L&T, Kalyani Group, M&M	40% Senior Level	20	40	40

9.2. Secondary Data

Information documented in Journals, Government publications, Minutes of Conference/Seminars held at national & international level were some valuable inputs.

9.3. Sampling Technique

Random sampling was used with voluntary participation of informants.

9.4. Measures for Ensuring Quality of Data

Spot checking was undertaken. Re-interview on case to case basis were carried out.

9.5. Questionnaire

The questionnaire was explicit; it included structured and semi-structured queries giving adequate flexibility for the respondent to express their thoughts and opinions without bias. The response was sought on a Likert (Five Point) Scale. Comprehensive questionnaires for the respective target audiences where administered.

10. DATA COLLATION, ANALYSIS, FINDINGS

Use of statistical analysis tools SPSS. The techniques used for data analysis and Interpretations are as follows: -

10.1. Exploratory Factor Analysis

This analysis helps to reduce correlated variables to certain attributable factors. For results, a total of 30 Questions were analyzed on Likert scale. Noticing the Screen plot and suppressing the absolute value below 0.385 the numbers of factors were reduced from 9 to 5. Based on the Questionnaire and the elimination of three questions, the Newly Grouped Factors are as follows:

Questions	*Content*
Q1 to Q5 (Less Q 6)	Well defined Plans & Sectors under Make in India initiative exists
Q8 to Q11 (Less Q7)	Policy changes in Defence Procurement & Production will boost this initiative
Q12 to Q16(Less Q17)	Strategic partnership, R&D & Transfer of Technology is a must
Q18 to Q25	Responses till date & new projects under progress are satisfactory
Q26 to Q30	Review of of Armed Forces weapon system requirement both in terms of range & depth in relation to performance of Indian Defence Public sector undertakings & Ordinance Factory Boards

10.2. Using the Scale-Building and Reliability Test

Cronbach's Alpha value of 0.754 confirms the reliability analysis:

Reliability Statistics

Cronbach's Alpha	*Cronbach's Alpha Based on Standardized Items*	*N of Items*
.754	.759	27

10.3. Inferential Statistics

Categorical data duly tabulated provided the basis for Use of Chi-square test of independence to test the hypothesis

Factors	*Pearson Chisquare*	*df*	*Asymp. Sig. (2 sided)*	*Inference*
Well defined Plans & Sectors under Make in India initiative exists	32.896	2	0.000	<0.05
Policy changes in Defence Procurement & Production will boost this initiative	14.103	2	0.001	<0.05
Strategic partnership, R&D & Transfer of Technology is a must	24.062	2	0.000	<0.05
Responses till date & new projects under progress are satisfactory	9.235	2	0.010	<0.05
Review of of Armed Forces weapon system requirement both in terms of range & depth in relation to performance of Indian Defence Public sector undertakings & Ordinance Factory Boards	26.739	2	0.000	<0.05

Seeing the results from Inferential Statistics, *our Hypothesis that Make in India initiative in Defence sector will be boon in long run has been proved correct.*

11. RESULTS TILL DATE

Post launch of this ambitious initiative, many national and international companies have come forward, many initiatives/policy decisions have been taken by Government to align this program to meet the present & futuristic needs of Defence sector based on continuous feedback been received from environment. Few important developments /Joint Ventures/Policy shifts are listed below:

a) **Government Recent Defence Policy for Bigger Role of Private Sector.** The policy implemented in early 2017, provides a mechanism for a long-term strategic partnership with industry majors through a competitive process, wherein industry partners will tie up with global manufacturers to seek technology transfers and manufacturing knowhow to set up domestic manufacturing infrastructure and supply chains. The policy will be implemented in a few select segments to begin with - fighter aircraft, submarines, armored vehicles and helicopters. Additional segments may be added in future. One company can be a strategic partner in one segment only.

b) **Foreign Direct Investment(FDI).** Self-reliance in arms & weapon production will further get a boost with latest increase to 100% limit in FDI.

c) **DPP 2016 and New Offset Clause.** The major recommendations which now have been implemented are:

   i) For the '*Buy Indian'* category, which includes inhouse designed & developed platforms have been introduced.

   ii) For the '*Make*' category,90% of the cost will borne by the government to encourage this category. Under this, there are further three subcategories: Make-I in which 90% project will funded by government, Make-II in which full refund by the government after a period of two years in case of failure of procurement action and Make-III wherein the project cost is less than Rs 3 Crore.

   iii) The validity of the Acceptance of Necessity (AoN) has been brought down to six months from earlier one year, implying that the Service Headquarters will have to issue the Request for Proposal (RFP) that much faster. Single vendor situations with justification has been accepted.

iv) And lastly, the offsets have been raised from the current Rs 300 Crore to Rs 2000 Crore.

d) **Goods & Services Tax(GST).** Manufacturing sector since independence has been troubled by indirect taxes. The landmark GST launched by the Government on 01July 2017, is a step forward to Make in India in Defence sector a reality. Implementation of landmark tax reform GST has further boosted confidence of foreign investors in the present regime policies by providing clarity in ease of doing business.

e) **Policy shift.** Revised government policy brings Defence Public Sector Undertakings (DPSUs) in gambit of excise duty/custom duty.

f) **Naval Projects**. Various projects to build Naval vessels, submarines, interceptor boats have been planned by PSUs and private players in India.

g) **Aerospace Projects.** A range of joint venture projects involving big aerospace companies such as Lockheed Martin, Boeing and Sikorsky with their Indian counterparts Tata Advanced Systems Ltd has started showing results. In Tamil Nadu, an integrated Defence and aerospace park -to accommodate thirty aerospace firms is been established. UK's Aerotek Engineering signed a JV with the Indian company SIKA for manufacturing and Maintenance, repair, and overhaul (MRO) of landing gear, hydraulic LRUs and actuators for fixed and rotary wing aircraft. Airbus awarded its largest manufacturing contract to private sector company Dynamatic Technologies, making it a Tier 1 sole-source supplier of flap track beams for Airbus A330s. Alongside, a modern US$100 million MRO facility with two widebody hangars and a GE90/ GEnx engine-overhaul shop in Nagpur is been setup.

h) **Use of Technology.** Industrial Licensing has been simplified and can be applied online. 'Make in India' portal for Defence Production (www.makeinindiaDefence.com) has been launched. Test facilities of DPSUs/OFB/DGQA/DGAQA/DRDO/Forces, which can be utilized by the private sector, have been displayed.

i) **Defence Exports.** From Rs 1153.35 Crore in 2013-14, the Defence exports increased to Rs 2059.18 Crore in 2015-16.

j) **JV with foreign countries.** Few important are summarized in table below.

Country	*JV Breakthrough*
France	Setting up technological and industrial projects in India. Investment of 2 billion euros.
Israel	Make with India in aviation, satellites, drones & military hardware and software with an investment of 40 billion US Dollars.
Japan	Special Strategic and Global Partnership with focus towards transfer of Defence Equipment, Technological Cooperation & infrastructure building.
Russia	Supply and joint manufacture of two hundred Kamov 226T helicopters. stealth frigates, Triumf S400 long range air Defence systems and air launched Brahmos missile systems and upgradation of frontline equipment like Sukhoi 30 MKI aircraft, T72 tanks and ICVs. JV in future ready combat vehicle (FRCV) and future infantry combat vehicle (FICV) projects of Indian Army.
USA	Make in India to modernize US-made Boeing CH-47 Chinook and Boeing AH-64 Apache helicopters.

12. DISCUSSION

To achieve what is desired from this initiative, several obstacles have to be tactfully encountered in Indian scenario. Some of them are listed below:

a) **Skill Development.** There is a vast difference between cheap labor and skilled labor. What we require in Defence sector is Skilled labor, which cannot be generated overnight. Skill requirement and Skill development in various specialized fields will be a big challenge in days to come. Under *Skill India initiative*, National Skills Qualification Frame Work (NSQF) compliant skill training is being promoted. ITIs have been selected to upgrade their training infrastructure. Spare equipment in working condition are being donated to ITIs by OFB/DPSUs for training. This requires to be streamlined and closely monitored.

b) **Role of Industry & HR leaders.** The new generation requires to be shown the path for converting their ideas into reality by removing the roadblocks. Leading major industries are required to play a pivotal role in making this program really successful in a time bound manner. It will fall back on HR leaders to ensure job creation is supported by policies and trainings that provide not only necessary skillsets but also enhances them on a timely basis, to meet the demand of the new age technologies.

c) **Infrastructure.** There is a lot to be done to improve and expand the existing infrastructure to align with the future manufacturing projects.

d) **Institutions and Policy framework.** A stable and mature institutional framework will be helpful in drafting long term policies for the nation.

e) **Other Issues.** All out support of Central and State governments to new projects to be extended keeping eye on corruption, regulations and clearance policy.

f) **Inhouse changes.** The privatization of most of the ordnance factories and some of the Defence PSUs should be considered on priority.

13. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

External assistance in form of strategic partnership or through offset/Transfer of Technology(ToT) would go a long way in operationalizing indigenous R&D projects. The thrust for indigenization is not only a strategic requirement and a political rhetoric of the short term but will have profound long-term implications. Expecting OEMs to honor their ToT and offsets commitments in India's ongoing or even proposed projects of the future should not derail the Make in India objectives. To develop and to nurture an indigenous Defence manufacturing sector, it is paramount to focus on India's strengths. Absorbing know-why and know-how of foreign equipment that are still in the pipeline would bring with it a set of challenges. Indirect/semi-direct offsets would be a win-win proposition for the OEM. Further research can be undertaken to find out the best proposition for Indian Defence manufacturing sector under Make in India initiative.

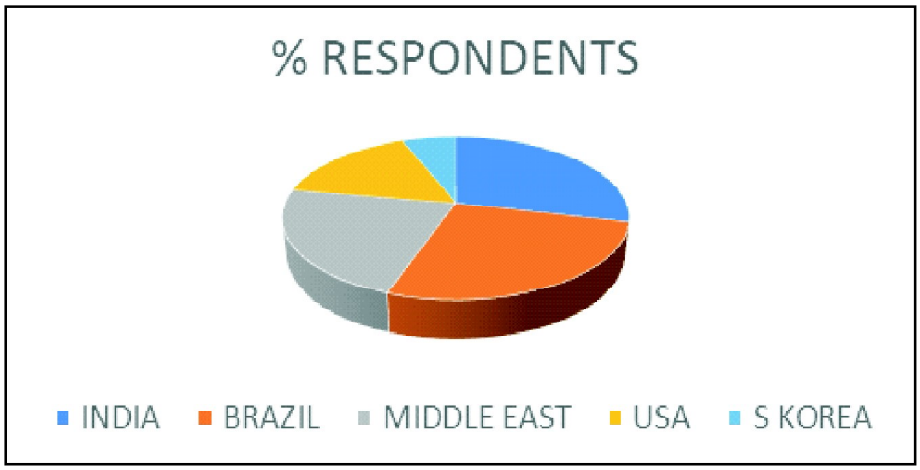
14. CONCLUSION

The concept of 'Make in India' is a very promising and innovative initiative. It is desired that the role of the government is to be a facilitator rather than a regulator. Through this campaign, selected domestic and

international companies with leadership in innovations and new technologies will help in boosting trade and economic growth and for turning them into global champions with self-reliance. The campaign is still in its initial stages but can be a total success with contribution of all stakeholders in Defence sector if 'Make in India' is tweaked to 'Make with India'& 'Export from India' in coming days. The initiative can be a success in India due to its vast demography, strong democracy, increasing demands & latest deregulation policy decisions taken by the Government of the day. The industry's longstanding request for linking Defence procurement with Defence production has been accepted &this inter-linkage would go a long way in realizing 'Make in India' in Defence a reality.

APPENDIX

Table 1
Most Attractive Markets Worldwide



Source: December 2015 Mckinsey Survey Defence Industry Executive

Table 2
Top 5 Arms Importers of the World

Importer	*Share of International Arms Import %*		*Main Supplier*
	2005-09	*2010-14*	
India	7	15	Russia (70%)
Saudi Arabia	1	5	UK (36%)
China	9	5	Russia (61%)
UAE	5 4	USA (58%)	
Pakistan	3 4	China (51%)	

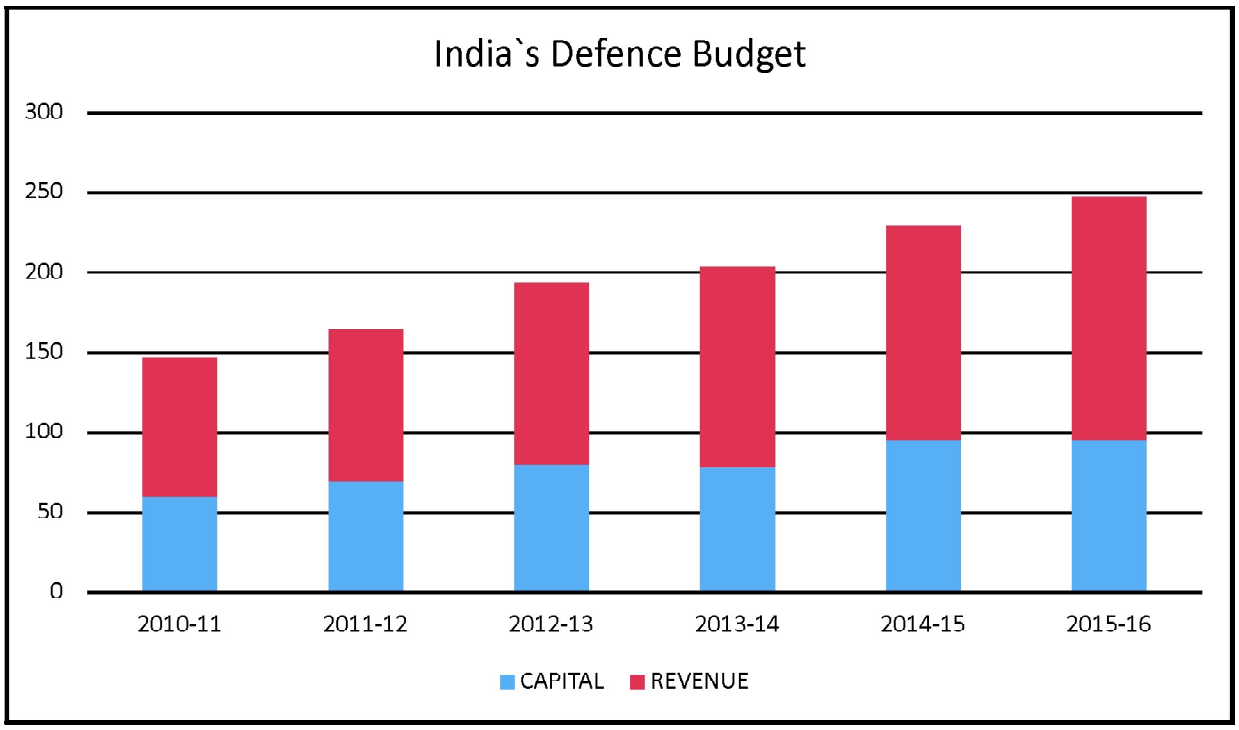
Source: Wikipedia

Table 3
India's Total Defence expenditure vs % GDP

Year	*Actual (INR in Crore)*	*% Increase*	*% GDP*
2010-11	154116.71	8.70	1.98
2011-12	170913.28	10.90	1.90
2012-13	181775.78	6.36	1.80
2013-14	203499.36	11.95	1.79
2014-15	174260.21	11.30	1.75
2015-16	246727	12.23	1.82

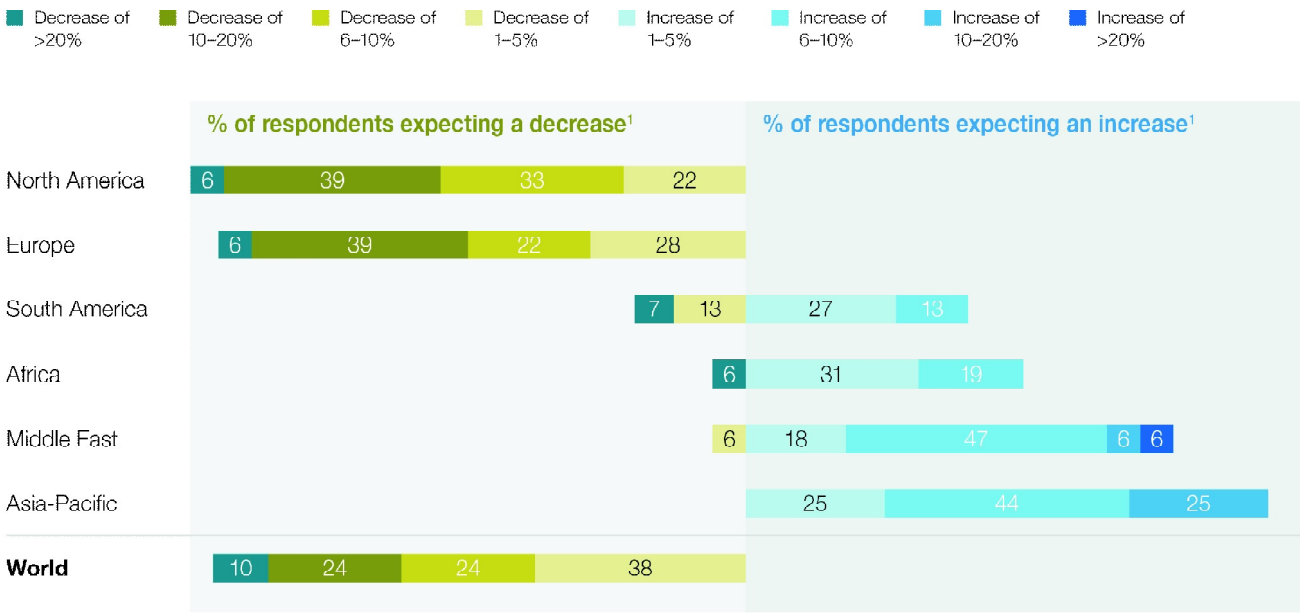
Source: Controller General of Defence Accounts

Table 4
India'S Defence Budget (Figures in'000 Crore INR)



Source: SIPRI Arms transfers database

Table 5
Expected Changes in Defense Spending



[1]Respondents who answered "no change" are not included. Figures do not sum to 100%, because of rounding.
Source: Dec 2012 McKinsey survey of defense-industry executives

Table 6
% Share of Indian Defence Budget FY 2016-17 & FY 2017-18

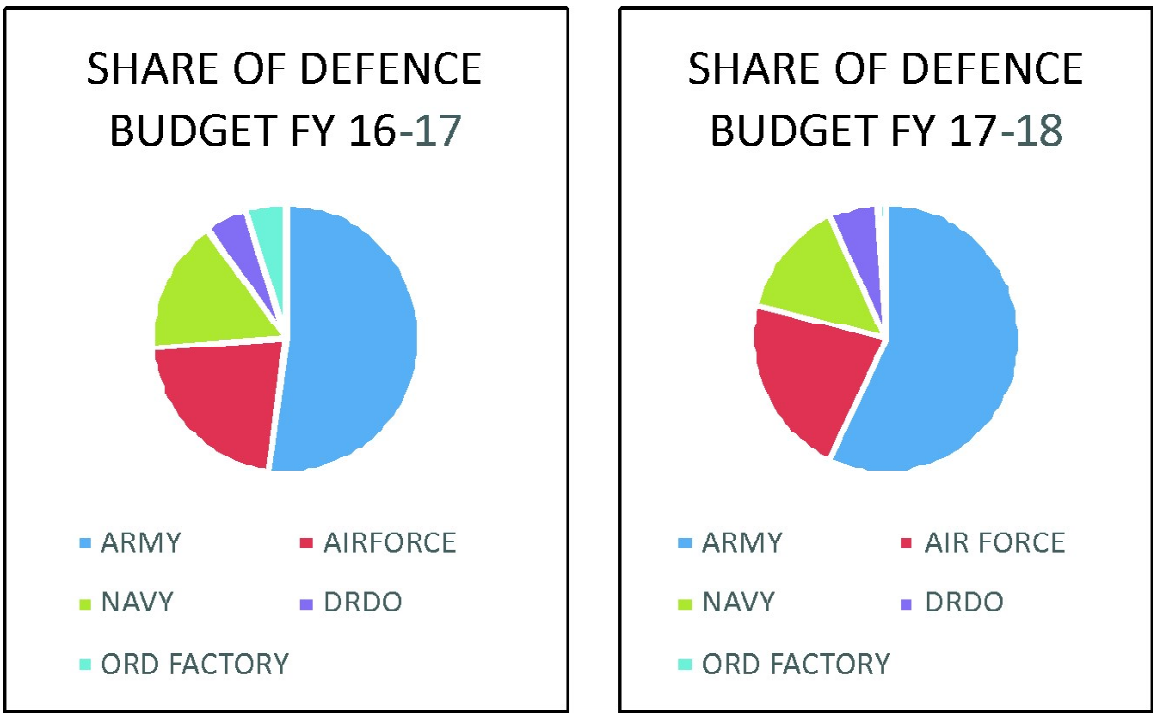
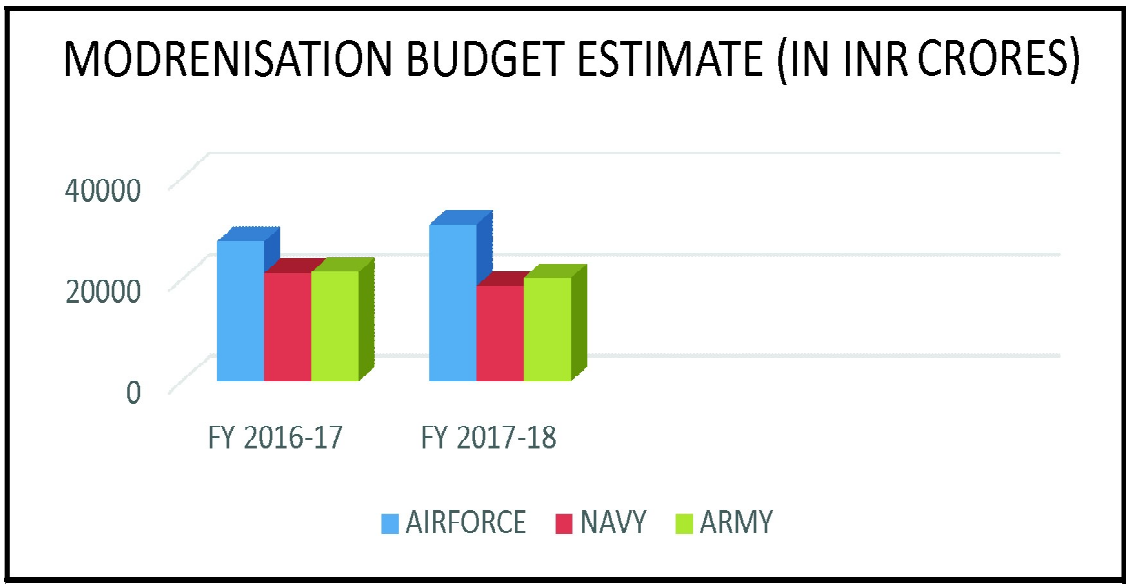


Table 7
Modernisation Budget Estimate FY 2016-17 & FY 2017-18



Source: Kpmg 2017 International Cooperative

Table 8
Self Reliance Index (1993-2013)

Year	*Total Acquisition Cost (Rs. Cr)*	*Indigenous Acquisition Cost (Rs. Cr)*	*Self Reliance %*
1993-94	399	1200	30%
2000-01	11164.5	3400	31%
2005-06	24464	7828	32%
2009-10	38258	12251	32%
2012-13	49578	26260	35%

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